Association of systemic immune-inflammation index with body mass index, waist circumference and prevalence of obesity in US adults

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Supplementary Table S1. The basis for selecting covariates.

Confounding relationship	Justification
Age → BMI	BMI tends to increase with age due to changes in metabolism, loss of muscle mass, and hormonal changes associated with aging[1,2].
Gender → Waist circumference	A systematic review comparing gender-specific waist circumference (WC) levels in Aboriginal and non-Aboriginal Australians found that of 17 selected cross-sectional studies, 9 focused on Aboriginal and 8 on non-Aboriginal Australians. Seven studies reported significantly higher WC estimates among indigenous females than males. On the other hand, non-indigenous males had significantly higher WC levels than females[3].
Race → BMI	BMI scores were consistently higher for women, racial/ethnic minority groups and those from a lower socio-economic position (SEP)[4]. Among the U.S. born in 2011, Chinese adults have an average BMI below the threshold for overweight, whereas blacks, Mexicans, and Puerto Ricans have average BMIs in the obese range[5].
Educational level → BMI, obesity	A cross-sectional population-based study was carried out with 1720 adults aged 20-59 in southern Brazil, in the fully adjusted model, the WC was 4.67 cm higher ($p < 0.05$) and the BMI was 1.12 kg/m^2 higher ($p < 0.05$) in the women residents of low education neighborhoods compared to the residents of high education areas. In the same group, the chance of central obesity and general obesity was, respectively, 2.05 (IC95% 1.19-3.52) and 1.85 (IC95% 1.04-3.29) times higher[6].
Marital status → Obesity	A cross-sectional national telephone survey of 3,025 U.S. adults aged 20-64 years showed that married men were significantly fatter and more likely to be obese than never married or previously married men, even when demographic, social, and physical variables were controlled[7].
poverty income ratio (PIR) → BMI	BMI scores were consistently higher for women, racial/ethnic minority groups and those from a lower socio-economic position (SEP)[4].
Energy intake → Obesity	Obesity prevalence has increased, and increased energy intake or decreased physical activity are the two most obvious contributing factors[8]. Increased energy intake is a major cause of postpartum obesity in women[9].
Physical activity → SII, obesity	Physical activity has emerged as an independent anti-inflammatory factor, distinct from its role in promoting weight loss[10]. Ding et al. conducted a study that revealed a negative association between leisure-

	time physical activity and inflammatory biomarkers in both overweight and obese populations. Notably, vigorous leisure-time physical activity demonstrated superior efficacy over moderate activity, particularly in regulating inflammation[11]. Moderate- and vigorous-intensity physical activity substantially reduces the risk of obesity[12].
Sleep disorder → obesity	Short sleep duration is associated with higher risk of central obesity in adults[13]. Fragmented sleep is independently associated with an increased risk of both general and abdominal obesity[14].
Smoke →SII, obesity	Acute cigarette smoking is followed by a temporary increase of systemic markers of oxidative stress, inflammation, and thrombosis, indicated by increased thiobarbituric acid reactive substances (TBARS), neutrophil elastase, leukotrienes, and leukocytes. In long-term smokers, these acute inflammatory processes induce tissue damage and turn into chronic inflammatory processes[15,16]. In addition, continuous secondhand smoke can be a risk factor for obesity[17].
Alcohol use → Obesity	In a cross-sectional study using data from the 2010 U.S. National Health Interview Survey, it was found that infrequent alcohol use was associated with obesity and higher BMI in adults[18]. In another cross-sectional study, more frequent alcohol consumption was found to be independently associated with reduced odds of obesity[19].

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Supplementary Data S2. The commands used in the analysis

```
R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#****************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#******************* www.EmpowerStats.com ******************************
#***************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_1_tbl1")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))


rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
```

```
rm(SII.Q4)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","    1","    2","    3","    4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","    1","    2","    3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","    1","    2","    3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","    1","    2","    3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2","    3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
```

```
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
slt.vname<-c()

library(weights,lib.loc=R.LibLocation)
library(Hmisc,lib.loc=R.LibLocation)

ofname<-"PROJ3_1_tbl1";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-WD$WTMECPRP;weights.var <- 'wtmecprp';
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
xv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SII,SMOKE,SLEE
P.DISORDER,ACTIVITY,DRINK,WAIST.CIRCUMFERENCE..CM.,OBESITY,ENERGY..1000
KCAL.,BODY.MASS.INDEX..KG.M..2.);
xvname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SII','SMOKE','SL
EEP.DISORDER','ACTIVITY','DRINK','WAIST.CIRCUMFERENCE..CM.','OBESITY','ENERG
Y..1000KCAL.','BODY.MASS.INDEX..KG.M..2.');
xvar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SII','SMOKE','S
LEEP_DISORDER','ACTIVITY','DRINK','WAIST_CIRCUMFERENCE__CM_','OBESITY','EN
```

```
ERGY__1000KCAL_','BODY_MASS_INDEX__KG_M__2_');
xlv<-c(2,0,4,3,3,3,0,3,2,3,2,0,2,0,0);
sxf<-NA;
svname<-NA; sv<-NA; slv<-NA;
av<-NA; avname<-NA; avlbl<-NA; nadj<-0; alv<-NA;
timev<-NA; timevname<-NA;
bv<-SII.Q4;bvar<-"SII.Q4";bvname<-"SII_Q4";
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-NA;dec<-2;parm<-c(NA, NA, 1,NA, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## weights Hmisc ##R package##;
mat2htmltable<-function(mat) {
   t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
   t2<- paste("<tr><td>",t1,"</td></tr>")
   return(paste(t2,collapse=" "))
}
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}
lmp <- function (mdl, dec) {
   p <- NA
   if (class(mdl) == "lm") {f <- summary(mdl)$fstatistic; p <-
pvformat(pf(f[1],f[2],f[3],lower.tail=F),dec); }
   return(p);
}
```

```
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN];
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
w<-c(w,paste("<h2>", title, "</h2>"))
allvname<-c(xvname,bvar,colvname,"weights"); allvname<-allvname[!is.na(allvname)];
WD<-data.frame(WD,TOT_=1)[,c(allvname,"TOT_")];
rm(xv,bv,colv)
decp <- max(dec+2,4);

if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];
   clvb_[is.na(clvb_)]<-clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}

if (is.na(bvar)) {ncc<-1; tt00<-"";
} else {
   bvb<-vlabelV[vnameV==bvar];
   blv<-levels(factor(WD[,bvar])); ncc<-length(blv);
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];
   blvb_[is.na(blvb_)]<-blv[is.na(blvb_)];
   tt00<-c(blvb_,"P-value","P-value*")
   WD<-WD[!is.na(WD[,bvar]),];
}

xv0<-xvname[xlv==0]; xv1<-xvname[xlv>0]; nxv0<-sum(xlv==0); nxv1<-sum(xlv>0);
xv0b<-vlabelV[match(xv0,vnameV)]; xv0b[is.na(xv0b)]<-xv0[is.na(xv0b)]
xv1b<-vlabelV[match(xv1,vnameV)]; xv1b[is.na(xv1b)]<-xv1[is.na(xv1b)]

for (k in 1:nclv) {
   if (!is.na(colvname) & k<nclv) {WD1<-WD[WD[,colvname]==clv[k],]; } else {WD1<-WD;}
   if (!is.na(bvar)) {
      tt <- c("", blvb_, "P value");
      if (ncc==2) tt <- c("", blvb_, "Standardize diff.", "P value");
      if (nxv0>0) {
         tt0 <- c("",xv0b);
```

```
        meanxx<-matrix(NA, nrow=nxv0, ncol=ncc);
        stdxx <-matrix(NA, nrow=nxv0, ncol=ncc);
        nnxx    <-matrix(NA, nrow=nxv0, ncol=ncc);
        for (i in (1:ncc)) {
          coli <- blvb_[i];
          WD2 <- WD1[WD1[,bvar]== blv[i],]
          for (j in (1:nxv0)) {
            meani <- wtd.mean(WD2[,xv0[j]], WD2$weights, na.rm=TRUE)
            stdi <- sqrt(wtd.var(WD2[,xv0[j]], WD2$weights, na.rm=TRUE))
            coli <- c(coli, paste(numfmt(meani,dec)," &#177 ", numfmt(stdi,dec), sep=""))
            meanxx[j,i]<-meani; stdxx[j,i]<-stdi
            nnxx[j,i] <- sum(WD2$weights, na.rm=TRUE)
          }
          tt0 <- cbind(tt0, coli);
        }
        if (ncc==2) {
           st.diff<-""
           for (j in 1:nxv0) {
             stddiff <- abs(meanxx[j,2] - meanxx[j,1])/sqrt((stdxx[j,2]^2 + stdxx[j,1]^2)/2)
             se <- sqrt((nnxx[j,1]+nnxx[j,2])/nnxx[j,1]/nnxx[j,2] +
stddiff^2/(2*(nnxx[j,1]+nnxx[j,2])))
             stddiff.l <- stddiff - 1.96 * se
             stddiff.u <- stddiff + 1.96 * se
             vi.stdiff<-paste(numfmt(stddiff,3), " (", numfmt(stddiff.l,3), ", ", numfmt(stddiff.u,3),
")", sep="")
             st.diff<-c(st.diff,vi.stdiff)
           }
           tt0 <- cbind(tt0, st.diff)
        }
        colp <- "P-value";
        for (j in 1:nxv0) {
          mdl<- lm(WD1[,xv0[j]]~factor(WD1[,bvar]), weights=WD1$weights, data=WD1)
          colp <- c(colp, lmp(mdl, decp))
        }
        tt0 <-cbind(tt0,colp);
        tt <- rbind(tt, tt0[-1,])
      }
      if (nxv1>0) {
        tt1 <- c("", blvb_, "P value");
        if (ncc==2) tt1 <- c("", blvb_, "Standardize diff.", "P value");
        for (j in (1:nxv1)) {
          vlv<-levels(factor(WD1[,xv1[j]]));
          vlvb_<-vlabelZ[match(paste(xv1[j],".",vlv,sep=""),vnameZ)];
          vlvb_[is.na(vlvb_)]<-vlv[is.na(vlvb_)];
```

```
            colxj <- c(xv1b[j],vlvb_);
            z <- NULL; sumw <- NULL
            for (i in (1:ncc)) {
               WD2 <- WD1[WD1[,bvar]== blv[i],]
               freqi <- wpct(WD2[,xv1[j]],weight=WD2$weights,na.rm=TRUE)
               ffi <- freqi[match(vlv,names(freqi))]
               z <-cbind(z, ffi)
               ffi <- c("",numfmt(freqi*100,dec))
               colxj <-cbind(colxj, ffi)
               sumw <- c(sumw, sum(WD2$weights,na.rm=TRUE))
            }
            if (ncc==2) {
               stddiff <- abs(z[,1]-z[,2])/sqrt((z[,1]*(1-z[,1])+z[,2]*(1-z[,2]))/2)
               se<-sqrt((sumw[1]+sumw[2])/sumw[1]/sumw[2] + stddiff^2/(2*(sumw[1]+sumw[2])))
               stddiff.l <- stddiff - 1.96 * se
               stddiff.u <- stddiff + 1.96 * se
               vi.stdiff<-paste(numfmt(stddiff,3), " (", numfmt(stddiff.l,3), ", ", numfmt(stddiff.u,3),
")", sep="")
               colxj <- cbind(colxj, c("", vi.stdiff))
            }
            chi <- wtd.chi.sq(WD1[,xv1[j]],WD1[,bvar],weight=WD1$weights,na.rm=TRUE)
            pv <- chi["p.value"];
            colp <- c(pvformat(pv,decp), rep("",times=length(vlv)))
            colxj<- cbind(colxj, colp)
            tt1 <- rbind(tt1, colxj)
         }
         tt <- rbind(tt, tt1[-1,])
      }

   } else {

      tt <- c("", "Statistics");
      if (nxv0>0) {
         tt0 <- c("",xv0b);
         colxx = "";
         for (j in (1:nxv0)) {
            meani <- wtd.mean(WD1[,xv0[j]], WD1$weights, na.rm=TRUE)
            stdi <- sqrt(wtd.var(WD1[,xv0[j]], WD1$weights, na.rm=TRUE))
            colxx <- c(colxx, paste(numfmt(meani,dec)," &#177 ", numfmt(stdi,dec), sep=""))
         }
         tt0<-cbind(tt0,colxx)
         tt <- rbind(tt, tt0[-1,])
      }
      if (nxv1>0) {
```

```
        tt1 <- c("", "%");
        for (j in (1:nxv1)) {
          vlv<-levels(factor(WD1[,xv1[j]]));
          vlvb_<-vlabelZ[match(paste(xv1[j],".",vlv,sep=""),vnameZ)];
          vlvb_[is.na(vlvb_)]<-vlv[is.na(vlvb_)];
          colxj <- c(xv1b[j],vlvb_);
          freqi <- wpct(WD1[,xv1[j]],weight=WD1$weights,na.rm=TRUE)
          ffi <- freqi[match(vlv,names(freqi))]
          ffi <- c("",numfmt(freqi*100,dec))
          colxj <-cbind(colxj, ffi)
          tt1 <- rbind(tt1, colxj)
        }
        tt <- rbind(tt, tt1[-1,])
      }

  }
  if (!is.na(colvname)) w<-c(w,"</br>",clvb[k])
  w<-c(w,"</br><table border=3>", mat2htmltable(tt), "</table>")
}

if (nxv0>0) {
  w<-c(w,"</br>Mean +/- SD for: ", paste(xv0b,sep="; "))
  if (!is.na(bvar)) w<-c(w, ". P value was calculated by weighted linear regression model.");
}
if (nxv1>0) {
  w<-c(w,"</br> % for: ", paste(xv1b,sep="; "))
  if (!is.na(bvar)) w<-c(w, ". P value was calculated by weighted chi-square test.");
}
w<-c(w,paste("</br>Created by EmpowerStats (www.empowerstats.com) and R on",Sys.Date()))
w<-c(w,wd.subset)
w<-c(w,"</body></html>")
fileConn<-file(paste(ofname,".htm",sep="")); writeLines(w, fileConn)




R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#****************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#******************** www.EmpowerStats.com *******************************
#*****************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
```

```
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_2_tbl1")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))


rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
rm(SII.Q4)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","    1","    2","    3","    4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","    1","    2","    3")
```

```
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","    1","    2","    3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","    1","    2","    3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
```

```
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
slt.vname<-c()

library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_2_tbl1";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-WD$WTMECPRP;weights.var <- 'wtmecprp';
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(BODY.MASS.INDEX..KG.M..2.);
yvname<-c('BODY.MASS.INDEX..KG.M..2.');
yvar<-c('BODY_MASS_INDEX__KG_M__2_');
ydist<-c('gaussian');
ylink<-c('identity');
ylv<-c(0);
xv<-cbind(LGSII);
xvname<-c('LGSII');
xvar<-c('LGSII');
xlv<-c(0);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
```

```
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
```

```
    }
}
mat2htmltable<-function(mat) {
    t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
    t2<- paste("<tr><td>",t1,"</td></tr>")
    return(paste(t2,collapse=" "))
}
setgam<-function(fml,yi) {
    if (ydist[yi]=="") ydist[yi]<-"gaussian"
    if (ydist[yi]=="exact") ydist[yi]<-"binomial"
    if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
    if  (ydist[yi]=="gaussian")  mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=gaussian(link="identity")))
    if  (ydist[yi]=="binomial")  mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
    if  (ydist[yi]=="poisson")  mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
    if  (ydist[yi]=="gamma")  mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
    if  (ydist[yi]=="negbin")  mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
    return(mdl)
}
setgee<-function(fml,yi) {
    if (ydist[yi]=="") ydist[yi]<-"gaussian"
    if (ydist[yi]=="exact") ydist[yi]<-"binomial"
    if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
    if                    (ydist[yi]=="gaussian")                    md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
    if                    (ydist[yi]=="binomial")                    md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
    if                    (ydist[yi]=="poisson")                    md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
    if                    (ydist[yi]=="gamma")                    md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
    if                    (ydist[yi]=="negbin")                    md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
    return(md)
}
```

```
setglm<-function(fml,yi) {
   if (ydist[yi]=="") ydist[yi]<-"gaussian"
   if (ydist[yi]=="exact") ydist[yi]<-"binomial"
   if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
   if (ydist[yi]=="gaussian") md<-try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="binomial") md<-try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="poisson") md<-try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="gamma") md<-try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
   return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
   if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
   if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
   gs<-summary(mdl); print(mdl$formula); print(gs)
   if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
   } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
   gsp<-gsparm[match(xxname,rownames(gsparm)),]
   if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
   } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
   ci1<- beta-1.96*se; ci2<- beta+1.96*se
   pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
   if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
   if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
      o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",",numfmt(exp(ci2),dec),")",sep="")
   } else {
      if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",",numfmt(ci2,dec),")",sep="")
      } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
   }
   o1<-paste(o1,pvv);    o1[is.na(beta)]<-NA
   if (length(xxname)>1) {
      if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
          o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
      } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
      o1[is.na(o1)]<-"";
   }
   return(list(o1,tmpn))
}
```

```
recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);  return(tmp.v1)
}
rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
  vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
  if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
  vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
  tmp<-is.na(wdf[,vvv]);
  return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
  if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
  if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
  if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
  if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
```

```
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
      t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
      for (i in 1:nx) {
        if (sxf[i]>1 & xlv[i]==0) {
            tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
            tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
            tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
            tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
            tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
            tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
            tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
            colnames(tmp.Xi)<-tmp.NM
            WD<-cbind(WD,tmp.Xi)
            t.xname<-c(t.xname,tmp.NM)
            t.xlv<-c(t.xlv,sxf[i],0)
            vnameV<-c(vnameV,tmp.NM)
            vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
            vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
            vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
        } else {
            t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
        }
      }
      xvname<-t.xname[-1]; xlv<-t.xlv[-1];
   }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
  if (!is.na(avname[1])) saf<-rep(0,length(saf));
  if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
  WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
   na<-length(avname)
   avb<-vlabelV[match(avname,vnameV)];
   avname_ <- avname
```

```
   smoothavi<-((saf=="s" | saf=="S") & alv==0)
   smoothav<-sum(smoothavi)
   smoothavname<-avname[smoothavi]
   avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
   avb1<-avb
   avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
   avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
   adjvb<-c(adjvb, paste(avb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
}
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
   svb<-vlabelV[match(svname,vnameV)];
   svname_ <- svname
   smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
   smoothsv<-sum(smoothsvi)
   smoothsvname<-svname[smoothsvi]
   svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
   svb1<-svb
   svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
   svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
   adjvb<-c(adjvb, paste(svb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
   fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
```

```
   if (xlv[j]==0) {
      xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
   } else {
      xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
      tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
      xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
if (is.na(par1)) par1<-1;
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
```

```
}
aa<-c(1,2,3,4)
for (i in 1:4) {
        for (j in c(1:4)[-i]) {
            for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
      rordc<-ifelse(rord[4]==1,3,4)
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
         if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
         if (!contx & nx==1) prn<-"CX"
         if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (j in (xbgn:xend)) {
            colj<-cbind(k,0,m,j,xxlbl_[[j]])
            nnj <-c(k,0,m,j)
            for (i in (1:ny)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
```

```
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="S") {
    tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in (1:ny)) {
        for (m in 1:nmdl) {
          for (j in (xbgn:xend)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]);
            nnj <- c(k,i,m,j)
            for (b in (1:nblv)) {
              print(paste("Stratified by",bvar, ":", blvb[b]))
              fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
              if (b<nblv) {
                wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
              } else {
                wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
              }
              wdtmp<-removeNA(i,j,m,wdtmp1)
              if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
              if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
              if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
              if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
              tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
              colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
          }
        }
```

```
      }
    }
  }
  if (prn=="M") {
    tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (j in xbgn:xend) {
          colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
          for (m in 1:nmdl) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="X") {
    tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
          colj<-cbind(k,i,m,0,yb[i])
          nnj <-c(k,i,m,0)
          for (j in (1:nx)) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
```

```
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="CX") {
    tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
    nxl<-length(xxlbl_[[1]])-1
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
            colj<-c(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
            wdtmp<-removeNA(i,1,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
            colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="UM") {
    tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                                    nn<-
c(0,0,0,0,"Univariable","Multivariable")
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
```

```
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (m in 1:nmdl) {
          colm<-rep(NA,6); nnm<-rep(NA,5)
          for (j in 1:(nx+1)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
            } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
          }
          tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
        }
      }
    }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
```

```
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
  if (nrr>1) {
    for (j in 1:nrr1) {
      if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
    }
  }
  oo<-rbind(oo,tt[i,])
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-(1:4)]}
w<-c(w,paste("<h2>", title, "</h2>"))
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")

for (m in 1:nmdl) w<-c(w,paste("</br>",fmlb[m],"model adjust for:", adjvb[m]))
if (smoothav>0 | smoothsv>0) w<-c(w,". Generalized additive models were applied")
if (!is.na(subjvname)) w<-c(w, paste("</br>Generalized estimate equation were used, subject ID=",
subjvname, "(", gee.TYPE,")",sep=""))



R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#***************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#****************** www.EmpowerStats.com ******************************
#*************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_3_tbl")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
```

```
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))


rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
rm(SII.Q4)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","    1","    2","    3","    4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","    1","    2","    3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","    1","    2","    3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","    1","    2","    3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
```

```
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
slt.vname<-c()
```

```
library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_3_tbl";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-WD$WTMECPRP;weights.var <- 'wtmecprp';
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(WAIST.CIRCUMFERENCE..CM.);
yvname<-c('WAIST.CIRCUMFERENCE..CM.');
yvar<-c('WAIST_CIRCUMFERENCE__CM_');
ydist<-c('gaussian');
ylink<-c('identity');
ylv<-c(0);
xv<-cbind(LGSII);
xvname<-c('LGSII');
xvar<-c('LGSII');
xlv<-c(0);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
```

```
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
   }
}
mat2htmltable<-function(mat) {
   t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
   t2<- paste("<tr><td>",t1,"</td></tr>")
   return(paste(t2,collapse=" "))
}
setgam<-function(fml,yi) {
   if (ydist[yi]=="") ydist[yi]<-"gaussian"
   if (ydist[yi]=="exact") ydist[yi]<-"binomial"
   if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
   if (ydist[yi]=="gaussian") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=gaussian(link="identity")))
```

```
  if (ydist[yi]=="binomial") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
  if (ydist[yi]=="poisson") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
  if (ydist[yi]=="gamma") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
  if (ydist[yi]=="negbin") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
  return(mdl)
}
setgee<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
  return(md)
}
setglm<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
```

```
   return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
   if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
   if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
   gs<-summary(mdl); print(mdl$formula); print(gs)
   if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
   } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
   gsp<-gsparm[match(xxname,rownames(gsparm)),]
   if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
   } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
   ci1<- beta-1.96*se; ci2<- beta+1.96*se
   pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
   if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
   if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
      o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",
",numfmt(exp(ci2),dec),")",sep="")
   } else {
      if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",
",numfmt(ci2,dec),")",sep="")
      } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
   }
   o1<-paste(o1,pvv);   o1[is.na(beta)]<-NA
   if (length(xxname)>1) {
      if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
         o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
      } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
      o1[is.na(o1)]<-"";
   }
   return(list(o1,tmpn))
}
recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);   return(tmp.v1)
}
rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
```

```
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
 vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
 if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
 vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
 tmp<-is.na(wdf[,vvv]);
 return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
 if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
 if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
      t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
      for (i in 1:nx) {
         if (sxf[i]>1 & xlv[i]==0) {
            tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
            tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
            tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
            tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
```

```
            tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
            tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
            tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
            colnames(tmp.Xi)<-tmp.NM
            WD<-cbind(WD,tmp.Xi)
            t.xname<-c(t.xname,tmp.NM)
            t.xlv<-c(t.xlv,sxf[i],0)
            vnameV<-c(vnameV,tmp.NM)
            vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
            vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
            vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
        } else {
            t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
        }
      }
      xvname<-t.xname[-1]; xlv<-t.xlv[-1];
  }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
 if (!is.na(avname[1])) saf<-rep(0,length(saf));
 if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
 WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
  na<-length(avname)
  avb<-vlabelV[match(avname,vnameV)];
  avname_ <- avname
  smoothavi<-((saf=="s" | saf=="S") & alv==0)
  smoothav<-sum(smoothavi)
  smoothavname<-avname[smoothavi]
  avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
  avb1<-avb
  avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
  avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
  fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
  fmlb<-c(fmlb,"Adjust")
  nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
  adjvb<-c(adjvb, paste(avb1, collapse="; "))
  fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
}
```

```
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
   svb<-vlabelV[match(svname,vnameV)];
   svname_ <- svname
   smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
   smoothsv<-sum(smoothsvi)
   smoothsvname<-svname[smoothsvi]
   svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
   svb1<-svb
   svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
   svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
   adjvb<-c(adjvb, paste(svb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
   fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
   if (xlv[j]==0) {
      xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
   } else {
      xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
      tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
      xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
if (is.na(par1)) par1<-1;
```

```
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
}
aa<-c(1,2,3,4)
for (i in 1:4) {
        for (j in c(1:4)[-i]) {
             for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
      rordc<-ifelse(rord[4]==1,3,4)
```

```
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
        if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
        if (!contx & nx==1) prn<-"CX"
        if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (j in (xbgn:xend)) {
          colj<-cbind(k,0,m,j,xxlbl_[[j]])
          nnj <-c(k,0,m,j)
          for (i in (1:ny)) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
   }
}
if (prn=="S") {
```

```
  tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
  for (k in (1:nclv)) {
    wdtmp0<-WD;
    if (!is.na(colvname)) {
      if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
      print(paste("Stratified by",colvname, ":", clvb[k]))
    }
    for (i in (1:ny)) {
      for (m in 1:nmdl) {
        for (j in (xbgn:xend)) {
          colj<-cbind(k,i,m,j,xxlbl_[[j]]);
          nnj <- c(k,i,m,j)
          for (b in (1:nblv)) {
            print(paste("Stratified by",bvar, ":", blvb[b]))
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            if (b<nblv) {
              wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
            } else {
              wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
            }
            wdtmp<-removeNA(i,j,m,wdtmp1)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
}
if (prn=="M") {
  tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
  for (k in (1:nclv)) {
    wdtmp0<-WD;
    if (!is.na(colvname)) {
      if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
      print(paste("Stratified by",colvname, ":", clvb[k]))
    }
    for (i in 1:ny) {
      for (j in xbgn:xend) {
```

```
            colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
            for (m in 1:nmdl) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
         }
      }
   }
}
if (prn=="X") {
   tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (i in (1:ny)) {
            colj<-cbind(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            for (j in (1:nx)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
         }
      }
   }
}
if (prn=="CX") {
```

```
    tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
    nxl<-length(xxlbl_[[1]])-1
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
            colj<-c(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
            wdtmp<-removeNA(i,1,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
            colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="UM") {
    tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                                    nn<-
c(0,0,0,0,"Univariable","Multivariable")
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (m in 1:nmdl) {
          colm<-rep(NA,6); nnm<-rep(NA,5)
          for (j in 1:(nx+1)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
```

```
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
            } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
          }
          tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
        }
      }
    }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
  if (nrr>1) {
    for (j in 1:nrr1) {
      if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
    }
  }
  oo<-rbind(oo,tt[i,])
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-
(1:4)]}
w<-c(w,paste("<h2>", title, "</h2>"))
```

```
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")
for (m in 1:nmdl) w<-c(w,paste("</br>",fmlb[m],"model adjust for:", adjvb[m]))
if (smoothav>0 | smoothsv>0) w<-c(w,". Generalized additive models were applied")
if (!is.na(subjvname)) w<-c(w, paste("</br>Generalized estimate equation were used, subject ID=",
subjvname, "(", gee.TYPE,")",sep=""))


R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#****************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#******************* www.EmpowerStats.com ********************************
#*************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_4_tbl1")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))


rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}
```

```
recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);  return(tmp.v1)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
print("Creating new variable: OBESITY.NEW")
OBESITY.NEW<- recodevar(OBESITY,c(1,2),c(1,0))
EmpowerStatsR<-cbind(EmpowerStatsR,OBESITY.NEW)
rm(SII.Q4,OBESITY.NEW)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","  1","  2","  3","  4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","  1","  2","  3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","  1","  2","  3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","  1","  2","  3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
```

```
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
vname<-c(vname,"OBESITY.NEW","OBESITY.NEW.0","OBESITY.NEW.1")
vlabel<-c(vlabel,"OBESITY NEW","    0","    1")
slt.vname<-c()
```

```
library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_4_tbl1";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-1;weights.var <- NA;
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(OBESITY.NEW);
yvname<-c('OBESITY.NEW');
yvar<-c('OBESITY_NEW');
ydist<-c('binomial');
ylink<-c('logit');
ylv<-c(2);
xv<-cbind(LGSII);
xvname<-c('LGSII');
xvar<-c('LGSII');
xlv<-c(0);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
```

```
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
   }
}
mat2htmltable<-function(mat) {
   t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
   t2<- paste("<tr><td>",t1,"</td></tr>")
   return(paste(t2,collapse=" "))
}
setgam<-function(fml,yi) {
   if (ydist[yi]=="") ydist[yi]<-"gaussian"
   if (ydist[yi]=="exact") ydist[yi]<-"binomial"
   if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
   if   (ydist[yi]=="gaussian")   mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
```

```
family=gaussian(link="identity")))
  if (ydist[yi]=="binomial") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
  if (ydist[yi]=="poisson") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
  if (ydist[yi]=="gamma") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
  if (ydist[yi]=="negbin") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
  return(mdl)
}
setgee<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
  return(md)
}
setglm<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
```

```
   if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
   return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
   if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
   if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
   gs<-summary(mdl); print(mdl$formula); print(gs)
   if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
   } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
   gsp<-gsparm[match(xxname,rownames(gsparm)),]
   if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
   } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
   ci1<- beta-1.96*se; ci2<- beta+1.96*se
   pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
   if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
   if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
      o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",
",numfmt(exp(ci2),dec),")",sep="")
   } else {
      if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",
",numfmt(ci2,dec),")",sep="")
      } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
   }
   o1<-paste(o1,pvv);   o1[is.na(beta)]<-NA
   if (length(xxname)>1) {
      if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
         o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
      } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
      o1[is.na(o1)]<-"";
   }
   return(list(o1,tmpn))
}
recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);   return(tmp.v1)
}
rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
```

```
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
 vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
 if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
 vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
 tmp<-is.na(wdf[,vvv]);
 return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
 if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
 if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
      t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
      for (i in 1:nx) {
         if (sxf[i]>1 & xlv[i]==0) {
            tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
            tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
            tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
```

```
            tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
            tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
            tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
            tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
            colnames(tmp.Xi)<-tmp.NM
            WD<-cbind(WD,tmp.Xi)
            t.xname<-c(t.xname,tmp.NM)
            t.xlv<-c(t.xlv,sxf[i],0)
            vnameV<-c(vnameV,tmp.NM)
            vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
            vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
            vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
          } else {
            t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
          }
        }
        xvname<-t.xname[-1]; xlv<-t.xlv[-1];
    }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
  if (!is.na(avname[1])) saf<-rep(0,length(saf));
  if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
  WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
    na<-length(avname)
    avb<-vlabelV[match(avname,vnameV)];
    avname_ <- avname
    smoothavi<-((saf=="s" | saf=="S") & alv==0)
    smoothav<-sum(smoothavi)
    smoothavname<-avname[smoothavi]
    avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
    avb1<-avb
    avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
    avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
    fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
    fmlb<-c(fmlb,"Adjust")
    nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
    adjvb<-c(adjvb, paste(avb1, collapse="; "))
    fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
```

```
}
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
   svb<-vlabelV[match(svname,vnameV)];
   svname_ <- svname
   smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
   smoothsv<-sum(smoothsvi)
   smoothsvname<-svname[smoothsvi]
   svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
   svb1<-svb
   svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
   svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
   adjvb<-c(adjvb, paste(svb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
   fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
   if (xlv[j]==0) {
      xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
   } else {
      xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
      tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
      xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
```

```
if (is.na(par1)) par1<-1;
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
}
aa<-c(1,2,3,4)
for (i in 1:4) {
        for (j in c(1:4)[-i]) {
             for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
```

```
      rordc<-ifelse(rord[4]==1,3,4)
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
        if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
        if (!contx & nx==1) prn<-"CX"
        if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (j in (xbgn:xend)) {
          colj<-cbind(k,0,m,j,xxlbl_[[j]])
          nnj <-c(k,0,m,j)
          for (i in (1:ny)) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
   }
}
```

```
if (prn=="S") {
   tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in (1:ny)) {
         for (m in 1:nmdl) {
            for (j in (xbgn:xend)) {
               colj<-cbind(k,i,m,j,xxlbl_[[j]]);
               nnj <- c(k,i,m,j)
               for (b in (1:nblv)) {
                  print(paste("Stratified by",bvar, ":", blvb[b]))
                  fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
                  if (b<nblv) {
                     wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
                  } else {
                     wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
                  }
                  wdtmp<-removeNA(i,j,m,wdtmp1)
                  if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
                  if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
                  if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
                  if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
                  tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
                  colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
               }
               tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
            }
         }
      }
   }
}
if (prn=="M") {
   tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
```

```
        for (j in xbgn:xend) {
          colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
          for (m in 1:nmdl) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="X") {
    tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
          colj<-cbind(k,i,m,0,yb[i])
          nnj <-c(k,i,m,0)
          for (j in (1:nx)) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
```

```
if (prn=="CX") {
   tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
   nxl<-length(xxlbl_[[1]])-1
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (i in (1:ny)) {
               colj<-c(k,i,m,0,yb[i])
               nnj <-c(k,i,m,0)
               fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
               wdtmp<-removeNA(i,1,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
               colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
               tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
         }
      }
   }
}
if (prn=="UM") {
   tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                                    nn<-
c(0,0,0,0,"Univariable","Multivariable")
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
         for (m in 1:nmdl) {
            colm<-rep(NA,6); nnm<-rep(NA,5)
            for (j in 1:(nx+1)) {
               colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
```

```
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
            } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
          }
          tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
        }
      }
    }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
  if (nrr>1) {
    for (j in 1:nrr1) {
      if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
    }
  }
  oo<-rbind(oo,tt[i,])
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-
(1:4)]}
```

```
w<-c(w,paste("<h2>", title, "</h2>"))
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")

for (m in 1:nmdl) w<-c(w,paste("</br>",fmlb[m],"model adjust for:", adjvb[m]))
if (smoothav>0 | smoothsv>0) w<-c(w,". Generalized additive models were applied")
if (!is.na(subjvname)) w<-c(w, paste("</br>Generalized estimate equation were used, subject ID=",
subjvname, "(", gee.TYPE,")",sep=""))



R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#***************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#****************** www.EmpowerStats.com ********************************
#*******************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_5_tbl")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))



rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
```

```
   print(tmp)
   return(outvar)
}


recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);  return(tmp.v1)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
print("Creating new variable: OBESITY.NEW")
OBESITY.NEW<- recodevar(OBESITY,c(1,2),c(1,0))
EmpowerStatsR<-cbind(EmpowerStatsR,OBESITY.NEW)
rm(SII.Q4,OBESITY.NEW)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","  1","  2","  3","  4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","  1","  2","  3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","  1","  2","  3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","  1","  2","  3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
```

```
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
```

```
vname<-c(vname,"OBESITY.NEW","OBESITY.NEW.0","OBESITY.NEW.1")
vlabel<-c(vlabel,"OBESITY NEW","    0","    1")
slt.vname<-c()

library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_5_tbl";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-WD$WTMECPRP;weights.var <- 'wtmecprp';
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(BODY.MASS.INDEX..KG.M..2.);
yvname<-c('BODY.MASS.INDEX..KG.M..2.');
yvar<-c('BODY_MASS_INDEX__KG_M__2_');
ydist<-c('gaussian');
ylink<-c('identity');
ylv<-c(0);
xv<-cbind(SII.Q4);
xvname<-c('SII.Q4');
xvar<-c('SII_Q4');
xlv<-c(4);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
```

```
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
   }
}
mat2htmltable<-function(mat) {
   t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
   t2<- paste("<tr><td>",t1,"</td></tr>")
   return(paste(t2,collapse=" "))
}
setgam<-function(fml,yi) {
   if (ydist[yi]=="") ydist[yi]<-"gaussian"
```

```
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=gaussian(link="identity")))
  if (ydist[yi]=="binomial") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
  if (ydist[yi]=="poisson") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
  if (ydist[yi]=="gamma") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
  if (ydist[yi]=="negbin") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
  return(mdl)
}
setgee<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
  return(md)
}
setglm<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
```

```
try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
  return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
  if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
  if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
  gs<-summary(mdl); print(mdl$formula); print(gs)
  if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
  } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
  gsp<-gsparm[match(xxname,rownames(gsparm)),]
  if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
  } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
  ci1<- beta-1.96*se; ci2<- beta+1.96*se
  pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
  if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
  if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
    o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",
",numfmt(exp(ci2),dec),")",sep="")
  } else {
    if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",
",numfmt(ci2,dec),")",sep="")
    } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
  }
  o1<-paste(o1,pvv);  o1[is.na(beta)]<-NA
  if (length(xxname)>1) {
    if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
      o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
    } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
    o1[is.na(o1)]<-"";
  }
  return(list(o1,tmpn))
}
recodevar <- function (var,oldcode,newcode) {
  tmp.v <- var
  nc.tmp <- length(oldcode)
  for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
  if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
  rm(tmp.v);  return(tmp.v1)
}
rankvar <- function(var, num) {
```

```
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
 vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
 if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
 vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
 tmp<-is.na(wdf[,vvv]);
 return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
 if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
 if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
       t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
       for (i in 1:nx) {
          if (sxf[i]>1 & xlv[i]==0) {
```

```
            tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
            tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
            tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
            tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
            tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
            tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
            tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
            colnames(tmp.Xi)<-tmp.NM
            WD<-cbind(WD,tmp.Xi)
            t.xname<-c(t.xname,tmp.NM)
            t.xlv<-c(t.xlv,sxf[i],0)
            vnameV<-c(vnameV,tmp.NM)
            vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
            vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
            vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
        } else {
            t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
        }
      }
      xvname<-t.xname[-1]; xlv<-t.xlv[-1];
  }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
 if (!is.na(avname[1])) saf<-rep(0,length(saf));
 if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
 WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
  na<-length(avname)
  avb<-vlabelV[match(avname,vnameV)];
  avname_ <- avname
  smoothavi<-((saf=="s" | saf=="S") & alv==0)
  smoothav<-sum(smoothavi)
  smoothavname<-avname[smoothavi]
  avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
  avb1<-avb
  avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
  avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
  fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
  fmlb<-c(fmlb,"Adjust")
```

```
   nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
   adjvb<-c(adjvb, paste(avb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
}
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
   svb<-vlabelV[match(svname,vnameV)];
   svname_ <- svname
   smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
   smoothsv<-sum(smoothsvi)
   smoothsvname<-svname[smoothsvi]
   svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
   svb1<-svb
   svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
   svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
   adjvb<-c(adjvb, paste(svb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
   fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
   if (xlv[j]==0) {
      xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
   } else {
      xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
      tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
      xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
```

```
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
if (is.na(par1)) par1<-1;
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
}
aa<-c(1,2,3,4)
for (i in 1:4) {
        for (j in c(1:4)[-i]) {
             for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
```

```
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
      rordc<-ifelse(rord[4]==1,3,4)
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
         if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
         if (!contx & nx==1) prn<-"CX"
         if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (j in (xbgn:xend)) {
            colj<-cbind(k,0,m,j,xxlbl_[[j]])
            nnj <-c(k,0,m,j)
            for (i in (1:ny)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
         }
```

```
      }
    }
  }
  if (prn=="S") {
    tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in (1:ny)) {
        for (m in 1:nmdl) {
          for (j in (xbgn:xend)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]);
            nnj <- c(k,i,m,j)
            for (b in (1:nblv)) {
              print(paste("Stratified by",bvar, ":", blvb[b]))
              fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
              if (b<nblv) {
                wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
              } else {
                wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
              }
              wdtmp<-removeNA(i,j,m,wdtmp1)
              if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
              if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
              if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
              if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
              tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
              colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
          }
        }
      }
    }
  }
  if (prn=="M") {
    tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
```

```
      print(paste("Stratified by",colvname, ":", clvb[k]))
    }
    for (i in 1:ny) {
      for (j in xbgn:xend) {
        colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
        for (m in 1:nmdl) {
          fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
          wdtmp<-removeNA(i,j,m,wdtmp0)
          if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
          if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
          if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
          if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
          tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
          colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
        }
        tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
      }
    }
  }
}
if (prn=="X") {
  tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
  for (k in (1:nclv)) {
    wdtmp0<-WD;
    if (!is.na(colvname)) {
      if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
      print(paste("Stratified by",colvname, ":", clvb[k]))
    }
    for (m in 1:nmdl) {
      for (i in (1:ny)) {
        colj<-cbind(k,i,m,0,yb[i])
        nnj <-c(k,i,m,0)
        for (j in (1:nx)) {
          fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
          wdtmp<-removeNA(i,j,m,wdtmp0)
          if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
          if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
          if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
          if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
          tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
          colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
        }
        tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
      }
```

```
      }
    }
  }
  if (prn=="CX") {
    tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
    nxl<-length(xxlbl_[[1]])-1
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
            colj<-c(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
            wdtmp<-removeNA(i,1,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
            colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="UM") {
    tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                    nn<-
  c(0,0,0,0,"Univariable","Multivariable")
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (m in 1:nmdl) {
          colm<-rep(NA,6); nnm<-rep(NA,5)
          for (j in 1:(nx+1)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
```

```
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
            } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
          }
          tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
        }
      }
    }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
  if (nrr>1) {
    for (j in 1:nrr1) {
      if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
    }
  }
  oo<-rbind(oo,tt[i,])
```

```
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-(1:4)]}
w<-c(w,paste("<h2>", title, "</h2>"))
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")

for (m in 1:nmdl) w<-c(w,paste("</br>",fmlb[m],"model adjust for:", adjvb[m]))
if (smoothav>0 | smoothsv>0) w<-c(w,". Generalized additive models were applied")
if (!is.na(subjvname)) w<-c(w, paste("</br>Generalized estimate equation were used, subject ID=",
subjvname, "(", gee.TYPE,")",sep=""))



R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#****************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#******************** www.EmpowerStats.com ********************************
#*******************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_6_tbl")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))



rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
```

```
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}


recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);  return(tmp.v1)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
print("Creating new variable: OBESITY.NEW")
OBESITY.NEW<- recodevar(OBESITY,c(1,2),c(1,0))
EmpowerStatsR<-cbind(EmpowerStatsR,OBESITY.NEW)
rm(SII.Q4,OBESITY.NEW)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","  1","  2","  3","  4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","  1","  2","  3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","  1","  2","  3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
```

```
vlabel<-c(vlabel,"PIR","  1","  2","  3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","  1","  2","  3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","  1","  2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","  1","  2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","  1","  2","  3","
4","  5","  6","  7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","  1","  2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","  1","  2","  3","
4","  5","  6","  7","  99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","  1","  2","  3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
vlabel<-c(vlabel,"DRINK","  1","  2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
```

```
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
vname<-c(vname,"OBESITY.NEW","OBESITY.NEW.0","OBESITY.NEW.1")
vlabel<-c(vlabel,"OBESITY NEW","    0","    1")
slt.vname<-c()

library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_6_tbl";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-WD$WTMECPRP;weights.var <- 'wtmecprp';
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(WAIST.CIRCUMFERENCE..CM.);
yvname<-c('WAIST.CIRCUMFERENCE..CM.');
yvar<-c('WAIST_CIRCUMFERENCE__CM_');
ydist<-c('gaussian');
ylink<-c('identity');
ylv<-c(0);
xv<-cbind(SII.Q4);
xvname<-c('SII.Q4');
xvar<-c('SII_Q4');
xlv<-c(4);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
```

```
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
   }
}
mat2htmltable<-function(mat) {
   t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
   t2<- paste("<tr><td>",t1,"</td></tr>")
   return(paste(t2,collapse=" "))
```

```
}
setgam<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=gaussian(link="identity")))
  if (ydist[yi]=="binomial") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
  if (ydist[yi]=="poisson") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
  if (ydist[yi]=="gamma") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
  if (ydist[yi]=="negbin") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
  return(mdl)
}
setgee<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
  return(md)
}
setglm<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
```

```
  if (ydist[yi]=="binomial") md<-try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
  return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
  if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
  if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
  gs<-summary(mdl); print(mdl$formula); print(gs)
  if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
  } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
  gsp<-gsparm[match(xxname,rownames(gsparm)),]
  if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
  } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
  ci1<- beta-1.96*se; ci2<- beta+1.96*se
  pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
  if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
  if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
    o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",",numfmt(exp(ci2),dec),")",sep="")
  } else {
    if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",",numfmt(ci2,dec),")",sep="")
    } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
  }
  o1<-paste(o1,pvv);   o1[is.na(beta)]<-NA
  if (length(xxname)>1) {
    if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
       o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
    } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
    o1[is.na(o1)]<-"";
  }
  return(list(o1,tmpn))
}
recodevar <- function (var,oldcode,newcode) {
  tmp.v <- var
  nc.tmp <- length(oldcode)
  for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
  if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-as.numeric(tmp.v)}
```

```
   rm(tmp.v);    return(tmp.v1)
}
rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
 vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
 if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
 vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
 tmp<-is.na(wdf[,vvv]);
 return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
 if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
 if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
 if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
```

```
        t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
        for (i in 1:nx) {
          if (sxf[i]>1 & xlv[i]==0) {
              tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
              tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
              tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
              tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
              tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
              tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
              tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
              colnames(tmp.Xi)<-tmp.NM
              WD<-cbind(WD,tmp.Xi)
              t.xname<-c(t.xname,tmp.NM)
              t.xlv<-c(t.xlv,sxf[i],0)
              vnameV<-c(vnameV,tmp.NM)
              vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
              vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
              vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
          } else {
              t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
          }
        }
        xvname<-t.xname[-1]; xlv<-t.xlv[-1];
    }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
  if (!is.na(avname[1])) saf<-rep(0,length(saf));
  if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
  WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
    na<-length(avname)
    avb<-vlabelV[match(avname,vnameV)];
    avname_ <- avname
    smoothavi<-((saf=="s" | saf=="S") & alv==0)
    smoothav<-sum(smoothavi)
    smoothavname<-avname[smoothavi]
    avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
    avb1<-avb
    avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
```

```
    avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
    fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
    fmlb<-c(fmlb,"Adjust")
    nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
    adjvb<-c(adjvb, paste(avb1, collapse="; "))
    fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
}
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
    svb<-vlabelV[match(svname,vnameV)];
    svname_ <- svname
    smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
    smoothsv<-sum(smoothsvi)
    smoothsvname<-svname[smoothsvi]
    svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
    svb1<-svb
    svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
    svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
    fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
    fmlb<-c(fmlb,"Adjust")
    nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
    adjvb<-c(adjvb, paste(svb1, collapse="; "))
    fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
    fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
    if (xlv[j]==0) {
        xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
    } else {
        xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
        tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
        xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
```

```
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
if (is.na(par1)) par1<-1;
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
}
aa<-c(1,2,3,4)
for (i in 1:4) {
        for (j in c(1:4)[-i]) {
             for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
```

```
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
      rordc<-ifelse(rord[4]==1,3,4)
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
         if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
         if (!contx & nx==1) prn<-"CX"
         if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (j in (xbgn:xend)) {
            colj<-cbind(k,0,m,j,xxlbl_[[j]])
            nnj <-c(k,0,m,j)
            for (i in (1:ny)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
```

```
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
          }
        }
      }
    }
    if (prn=="S") {
      tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
      for (k in (1:nclv)) {
        wdtmp0<-WD;
        if (!is.na(colvname)) {
          if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
          print(paste("Stratified by",colvname, ":", clvb[k]))
        }
        for (i in (1:ny)) {
          for (m in 1:nmdl) {
            for (j in (xbgn:xend)) {
              colj<-cbind(k,i,m,j,xxlbl_[[j]]);
              nnj <- c(k,i,m,j)
              for (b in (1:nblv)) {
                print(paste("Stratified by",bvar, ":", blvb[b]))
                fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
                if (b<nblv) {
                  wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
                } else {
                  wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
                }
                wdtmp<-removeNA(i,j,m,wdtmp1)
                if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
                if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
                if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
                if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
                tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
                colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
              }
              tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
            }
          }
        }
      }
    }
    if (prn=="M") {
      tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
      for (k in (1:nclv)) {
```

```
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (j in xbgn:xend) {
          colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
          for (m in 1:nmdl) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="X") {
    tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
          colj<-cbind(k,i,m,0,yb[i])
          nnj <-c(k,i,m,0)
          for (j in (1:nx)) {
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
```

```
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="CX") {
    tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
    nxl<-length(xxlbl_[[1]])-1
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
            colj<-c(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
            wdtmp<-removeNA(i,1,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
            colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="UM") {
    tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                                    nn<-
c(0,0,0,0,"Univariable","Multivariable")
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
        for (m in 1:nmdl) {
          colm<-rep(NA,6); nnm<-rep(NA,5)
```

```
            for (j in 1:(nx+1)) {
               colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
               if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
               } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
            }
            tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
         }
      }
   }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
   if (nrr>1) {
      for (j in 1:nrr1) {
         if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
```

```
      }
   }
   oo<-rbind(oo,tt[i,])
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-(1:4)]}
w<-c(w,paste("<h2>", title, "</h2>"))
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")

for (m in 1:nmdl) w<-c(w,paste("</br>",fmlb[m],"model adjust for:", adjvb[m]))
if (smoothav>0 | smoothsv>0) w<-c(w,". Generalized additive models were applied")
if (!is.na(subjvname)) w<-c(w, paste("</br>Generalized estimate equation were used, subject ID=",
subjvname, "(", gee.TYPE,")",sep=""))



R.Version4RUN<-343;
R.LibLocation <- "C:/Users/15949/AppData/Roaming/EmpowerRCH/R343/library"
#***************** Regarding ALL Following R Functions ********************
#***** COPYRIGHT (c) 2010 X&Y Solutions, ALL RIGHT RESERVED ***************
#****************** www.EmpowerStats.com ******************************
#*************************************************************************
Sys.setlocale("LC_TIME", "C")
library(doBy,lib.loc=R.LibLocation)
library(plotrix,lib.loc=R.LibLocation)
library(stringi,lib.loc=R.LibLocation)
library(stringr,lib.loc=R.LibLocation)
library(survival,lib.loc=R.LibLocation)
library(rms,lib.loc=R.LibLocation)
library(nnet,lib.loc=R.LibLocation)
library(car,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)
pdfwd<-6; pdfht<-6
setwd("C:/Users/15949/Desktop/Obesity/PROJ3_7_tbl1")
load("C:/Users/15949/Desktop/Obesity/SIIobesityAA.Rdata")
if (length(which(ls()=="EmpowerStatsR"))==0) EmpowerStatsR<-get(ls()[1])
names(EmpowerStatsR)<-toupper(names(EmpowerStatsR))



rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) }}
```

```
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) {outvar[var>=cutpoints[k]] <- k}
   tmp<-c(min(var,na.rm=TRUE),cutpoints,max(var,na.rm=TRUE))
   names(tmp)<-c("Min",names(cutpoints),"Max")
   print(tmp)
   return(outvar)
}


recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);  return(tmp.v1)
}


attach(EmpowerStatsR)
sink("C:/Users/15949/Desktop/Obesity/datastep/PROJ3_datastep.lst")
print("Creating new variable: SII.Q4")
SII.Q4<- rankvar(SII,4)
EmpowerStatsR<-cbind(EmpowerStatsR,SII.Q4)
print("Creating new variable: OBESITY.NEW")
OBESITY.NEW<- recodevar(OBESITY,c(1,2),c(1,0))
EmpowerStatsR<-cbind(EmpowerStatsR,OBESITY.NEW)
rm(SII.Q4,OBESITY.NEW)
detach(EmpowerStatsR)
sink()
vname<-c("_N_","_STAT_","_TOTAL_","SEQN","GENDER","GENDER.1","GENDER.2")
vname<-c(vname,"AGE","RACE","RACE.1","RACE.2","RACE.3","RACE.4")
vlabel<-c(vlabel,"AGE","RACE","  1","  2","  3","  4")
vname<-
c(vname,"EDUCATION.LEVEL","EDUCATION.LEVEL.1","EDUCATION.LEVEL.2","EDUC
ATION.LEVEL.3")
vlabel<-c(vlabel,"EDUCATION.LEVEL","  1","  2","  3")
vname<-
c(vname,"MARITAL.STATUS","MARITAL.STATUS.1","MARITAL.STATUS.2","MARITAL.S
TATUS.3")
vlabel<-c(vlabel,"MARITAL.STATUS","  1","  2","  3")
vname<-c(vname,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
```

```
vlabel<-c(vlabel,"WTMECPRP","RATIO.OF.FAMILY.INCOME.TO.POVERTY")
vname<-
c(vname,"PIR","PIR.1","PIR.2","PIR.3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vlabel<-c(vlabel,"PIR","    1","    2","    3","LYMPHOCYTE.NUMBER..1000.CELLS.UL.")
vname<-
c(vname,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vlabel<-
c(vlabel,"NEUTROPHILS.NUM..1000.CELL.UL.","PLATELET.COUNT..1000.CELLS.UL.")
vname<-c(vname,"SII","LGSII","SMOKE","SMOKE.1","SMOKE.2","SMOKE.3")
vlabel<-c(vlabel,"SII","LGSII","SMOKE","    1","    2","    3")
vname<-c(vname,"SLEEP.DISORDER","SLEEP.DISORDER.1","SLEEP.DISORDER.2")
vlabel<-c(vlabel,"SLEEP.DISORDER","    1","    2")
vname<-
c(vname,"VIGOROUS.RECREATIONAL.ACTIVITIES","VIGOROUS.RECREATIONAL.ACTI
VITIES.1","VIGOROUS.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"VIGOROUS.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","DAYS.VIGOROUS.RECREAT
IONAL.ACTIVITIES.1","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.2","DAYS.VIGO
ROUS.RECREATIONAL.ACTIVITIES.3","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIE
S.4","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.5","DAYS.VIGOROUS.RECREATI
ONAL.ACTIVITIES.6","DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES.7")
vlabel<-c(vlabel,"DAYS.VIGOROUS.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7")
vname<-c(vname,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.VIGOROUS.RECREATIONAL.ACTIVITIES")
vname<-
c(vname,"MODERATE.RECREATIONAL.ACTIVITIES","MODERATE.RECREATIONAL.AC
TIVITIES.1","MODERATE.RECREATIONAL.ACTIVITIES.2")
vlabel<-c(vlabel,"MODERATE.RECREATIONAL.ACTIVITIES","    1","    2")
vname<-
c(vname,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","DAYS.MODERATE.RECRE
ATIONAL.ACTIVITIES.1","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.2","DAYS.M
ODERATE.RECREATIONAL.ACTIVITIES.3","DAYS.MODERATE.RECREATIONAL.ACTIV
ITIES.4","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.5","DAYS.MODERATE.RECR
EATIONAL.ACTIVITIES.6","DAYS.MODERATE.RECREATIONAL.ACTIVITIES.7","DAYS.
MODERATE.RECREATIONAL.ACTIVITIES.99")
vlabel<-c(vlabel,"DAYS.MODERATE.RECREATIONAL.ACTIVITIES","      1","      2","      3","
4","    5","    6","    7","    99")
vname<-c(vname,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vlabel<-c(vlabel,"MINUTES.MODERATE.RECREATIONAL.ACTIVITIES")
vname<-c(vname,"ACTIVITY","ACTIVITY.1","ACTIVITY.2","ACTIVITY.3")
vlabel<-c(vlabel,"ACTIVITY","    1","    2","    3")
vname<-c(vname,"DRINK","DRINK.1","DRINK.2","BODY.MASS.INDEX..KG.M..2.")
```

```
vlabel<-c(vlabel,"DRINK","    1","    2","BODY.MASS.INDEX..KG.M..2.")
vname<-c(vname,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vlabel<-c(vlabel,"WAIST.CIRCUMFERENCE..CM.","ENERGY..KCAL.")
vname<-c(vname,"OBESITY","OBESITY.1","OBESITY.2","ENERGY..1000KCAL.")
vlabel<-c(vlabel,"OBESITY","    1","    2","ENERGY..1000KCAL.")
vname<-c(vname,"SII.Q4","SII.Q4.0","SII.Q4.1","SII.Q4.2","SII.Q4.3")
vname<-c(vname,"OBESITY.NEW","OBESITY.NEW.0","OBESITY.NEW.1")
vlabel<-c(vlabel,"OBESITY NEW","    0","    1")
slt.vname<-c()

library(gdata,lib.loc=R.LibLocation)
library(geepack,lib.loc=R.LibLocation)
library(mgcv,lib.loc=R.LibLocation)

ofname<-"PROJ3_7_tbl1";
WD<-EmpowerStatsR; wd.subset="";
svy.DSN.YN <- FALSE;
weights<-1;weights.var <- NA;
WD<-cbind(WD,weights); WD<-WD[!is.na(weights),];
attach(WD)
subjvname<-NA;
yv<-cbind(OBESITY.NEW);
yvname<-c('OBESITY.NEW');
yvar<-c('OBESITY_NEW');
ydist<-c('binomial');
ylink<-c('logit');
ylv<-c(2);
xv<-cbind(SII.Q4);
xvname<-c('SII.Q4');
xvar<-c('SII_Q4');
xlv<-c(4);
sxf<-c(NA,0)[-1];
sv<-
cbind(GENDER,AGE,RACE,EDUCATION.LEVEL,MARITAL.STATUS,PIR,SMOKE,SLEEP.D
ISORDER,ACTIVITY,DRINK,ENERGY..1000KCAL.);
svname<-
c('GENDER','AGE','RACE','EDUCATION.LEVEL','MARITAL.STATUS','PIR','SMOKE','SLEEP
.DISORDER','ACTIVITY','DRINK','ENERGY..1000KCAL.');
svar<-
c('GENDER','AGE','RACE','EDUCATION_LEVEL','MARITAL_STATUS','PIR','SMOKE','SLEE
P_DISORDER','ACTIVITY','DRINK','ENERGY__1000KCAL_');
sdf<-c(NA,0,0,0,0,0,0,0,0,0,0)[-1];
slv<-c(2,0,4,3,3,3,3,2,3,2,0);
av<-cbind(GENDER,AGE,RACE);
```

```
avname<-c('GENDER','AGE','RACE');
if (!is.na(avname[1])) avlbl<-vlabel[match(avname, vname)];
nadj<-length(avname);alv<-c(2,0,4);
saf<-c(NA,0,0,0)[-1];
timev<-NA; timevname<-NA;
bv<-NA; bvar<-NA;
colv<-NA; colvname<-NA;
v.start<-NA; vname.start<-NA;
v.stop<-NA; vname.stop<-NA;
par1<-1;dec<-2;parm<-c(1,NA, 1,1, 0);
if (!exists("pdfwd")) pdfwd<-6;
if (!exists("pdfht")) pdfht<-6;
##R package## gdata geepack mgcv ##R package##;
pvformat<-function(p,dec) {
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p)); colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   lw <- paste("<",substr("0.00000000000",1,dec+1),"1",sep="");
   pp[as.numeric(p)<(1/10^dec)]<-lw
   return(pp)
}
numfmt<-function(p,dec) {
   if (is.list(p)) p<-as.matrix(p)
   pp <- sprintf(paste("%.",dec,"f",sep=""),as.numeric(p))
   if (is.matrix(p)) {pp<-matrix(pp, nrow=nrow(p));colnames(pp)<-colnames(p);rownames(pp)<-
rownames(p);}
   pp[as.numeric(p)>10000000]<- "inf."
   pp[is.na(p) | gsub(" ","",p)==""]<- ""
   pp[p=="-Inf"]<-"-Inf"
   pp[p=="Inf"]<-"Inf"
   return(pp)
}

varstats<-function(var,vlvl,dec) {
   if (length(vlvl)==1 & vlvl[1]==0) {

return(paste(numfmt(mean(var,na.rm=TRUE),dec),numfmt(sd(var,na.rm=TRUE),dec),sep="+"))
   } else {
      a<-table(var)
      b<-matrix(paste(a, " (", numfmt(a/sum(a)*100,dec), "%)",sep=""),ncol=1)
      return(c(" ",b[match(vlvl,names(a))]))
   }
}
mat2htmltable<-function(mat) {
```

```
  t1<- apply(mat,1,function(z) paste(z,collapse="</td><td>"))
  t2<- paste("<tr><td>",t1,"</td></tr>")
  return(paste(t2,collapse=" "))
}
setgam<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=gaussian(link="identity")))
  if (ydist[yi]=="binomial") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=binomial(link="logit")))
  if (ydist[yi]=="poisson") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=poisson(link="log")))
  if (ydist[yi]=="gamma") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=Gamma(link="inverse")))
  if (ydist[yi]=="negbin") mdl<-try(gam(formula(fml),weights=wdtmp$weights,data=wdtmp,
family=negbin(c(1,10), link="log")))
  return(mdl)
}
setgee<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
  if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
  if (ydist[yi]=="gaussian") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="gaussian",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="binomial") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="binomial",weights=w
dtmp$weights,data=wdtmp))
  if (ydist[yi]=="poisson") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="poisson",weights=wdt
mp$weights,data=wdtmp))
  if (ydist[yi]=="gamma") md<-
try(geeglm(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,family="Gamma",weights=wd
tmp$weights,data=wdtmp))
  if (ydist[yi]=="negbin") md<-
try(geeglm.nb(formula(fml),id=wdtmp[,subjvname],corstr=gee.TYPE,weights=wdtmp$weights,da
ta=wdtmp))
  return(md)
}
setglm<-function(fml,yi) {
  if (ydist[yi]=="") ydist[yi]<-"gaussian"
  if (ydist[yi]=="exact") ydist[yi]<-"binomial"
```

```
   if (ydist[yi]=="breslow") ydist[yi]<-"binomial"
   if (ydist[yi]=="gaussian") md<-try(glm(formula(fml),family="gaussian",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="binomial") md<-try(glm(formula(fml),family="binomial",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="poisson") md<-try(glm(formula(fml),family="poisson",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="gamma") md<-try(glm(formula(fml),family="Gamma",weights=wdtmp$weights,data=wdtmp))
   if (ydist[yi]=="negbin") md<-try(glm.nb(formula(fml),weights=wdtmp$weights,data=wdtmp))
   return(md)
}
mdl2oo<-function(mdl, xxname, opt) {
   if (is.na(mdl[[1]][1])) return(list(rep("",times=length(xxname)),""))
   if (substr(mdl[[1]][1],1,5)=="Error") return(list(rep("",times=length(xxname)),""))
   gs<-summary(mdl); print(mdl$formula); print(gs)
   if (opt=="gam") {gsparm <- gs$p.table;tmpn<-gs$n;
   } else {gsparm <- gs$coefficients;tmpn <- sum(gs$df[c(1,2)]);}
   gsp<-gsparm[match(xxname,rownames(gsparm)),]
   if (length(xxname)==1) {beta<-gsp[1]; se<-gsp[2]; pv<-gsp[4];
   } else {beta<-gsp[,1]; se<-gsp[,2]; pv<-gsp[,4]; }
   ci1<- beta-1.96*se; ci2<- beta+1.96*se
   pvx<-substr(rep("****",length(pv)),1,(pv<=0.05)+(pv<=0.01)+(pv<=0.001))
   if (colprn==3) {pvv<-pvx;} else {pvv<-pvformat(pv,dec+2);}
   if ((colprn!=2) & (gs$family[[2]]=="log" | gs$family[[2]]=="logit")) {
      o1<-paste(numfmt(exp(beta),dec)," (",numfmt(exp(ci1),dec),",",numfmt(exp(ci2),dec),")",sep="")
   } else {
      if (colprn<3) {o1<-paste(numfmt(beta,dec), " (",numfmt(ci1,dec),",",numfmt(ci2,dec),")",sep="")
      } else {o1<-paste(numfmt(beta,dec), "+",numfmt(se,dec),sep="");}
   }
   o1<-paste(o1,pvv);   o1[is.na(beta)]<-NA
   if (length(xxname)>1) {
      if (gs$family[[2]]=="log" | gs$family[[2]]=="logit") {
          o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"1.0"
      } else {o1[is.na(o1) & substr(xxname,1,7)=="factor("]<-"0";}
      o1[is.na(o1)]<-"";
   }
   return(list(o1,tmpn))
}
recodevar <- function (var,oldcode,newcode) {
   tmp.v <- var
   nc.tmp <- length(oldcode)
```

```
   for (i in (1:nc.tmp)) {tmp.v[(var==oldcode[i])]=newcode[i]}
   if (is.factor(tmp.v)) {tmp.v1<-as.numeric(as.character(tmp.v))} else {tmp.v1<-
as.numeric(tmp.v)}
   rm(tmp.v);   return(tmp.v1)
}
rankvar <- function(var, num) {
   qprobs <- 1/num
   if (num>2) {for (i in (2:(num-1))) {qprobs <- c(qprobs, 1/num * i) } }
   outvar <- rep(0, times=length(var))
   outvar[is.na(var)] <- NA
   cutpoints <- quantile(var,probs=qprobs, na.rm=TRUE)
   for (k in (1:length(cutpoints))) { outvar[var>=cutpoints[k]] <- k; }
   return(outvar)
}
removeNA<-function(i,j,m,wdf) {
  vvv<-c(yvname[i],adjvv[[m]],subjvname,colvname,bvar,vname.start,vname.stop,timevname);
  if (j<=nx) {vvv<-c(vvv,xvname[j]);} else {vvv<-c(vvv,xvname);}
  vvv<-vvv[!is.na(vvv)]; vvv<-vvv[vvv>" "]
  tmp<-is.na(wdf[,vvv]);
  return(wdf[apply(tmp,1,sum)==0,])
}
vlabelN<-(substr(vlabel,1,1)==" ");
vlabelZ<-vlabel[vlabelN];vlabelV<-vlabel[!vlabelN]
vnameV<-vname[!vlabelN];vnameZ<-vname[vlabelN]
w<-c("<html><head>","<meta http-equiv=\"Content-Type\" content=\"text/html\"
charset=\"gb2312\" /></head><body>")
if (!is.na(avname[1])) {
  if (sum((saf=="s" | saf=="S") & alv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
  if (!is.na(subjvname) & (sum((saf=="s" | saf=="S") & alv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
if (!is.na(svname[1])) {
  if (sum((sdf=="s" | sdf=="S") & slv>0)>0) w<-c(w,"</br>Spline smoothing only applies for
continuous variables")
  if (!is.na(subjvname) & (sum((sdf=="s" | sdf=="S") & slv==0)>0)) w<-c(w,"</br>Generalized
estimate equation could not be used with spline smoothing terms")
}
allvname<-
c(yvname,xvname,colvname,bvar,avname,svname,subjvname,vname.start,vname.stop,timevname,
"weights");
allvname<-allvname[!is.na(allvname)]
WD<-WD[,allvname];
if (!is.na(subjvname)) WD<-WD[order(WD[,subjvname]),]
```

```
if (!is.na(sxf[1])) {
   if (sum(sxf>1 & xlv>0)>0) w<-c(w,"Categorizing only applies to continuous variables");
   if (sum(sxf>1 & xlv==0)>0) {
       t.xname<-NA;t.xlv<-NA; nx<-length(xvname)
       for (i in 1:nx) {
          if (sxf[i]>1 & xlv[i]==0) {
              tmp.Xi<- rankvar(WD[,xvname[i]],sxf[i])
              tmp.newcode <- tapply(WD[,xvname[i]],tmp.Xi,function(z) median(z,na.rm=TRUE))
              tmp.low <- tapply(WD[,xvname[i]],tmp.Xi,function(z) min(z,na.rm=TRUE))
              tmp.upp <- tapply(WD[,xvname[i]],tmp.Xi,function(z) max(z,na.rm=TRUE))
              tmp.Xi2<- recodevar(tmp.Xi,(1:sxf[i])-1,tmp.newcode)
              tmp.Xi<-cbind(tmp.Xi,tmp.Xi2)
              tmp.NM<-paste(xvname[i],c("grp","grp.cont"),sep=".")
              colnames(tmp.Xi)<-tmp.NM
              WD<-cbind(WD,tmp.Xi)
              t.xname<-c(t.xname,tmp.NM)
              t.xlv<-c(t.xlv,sxf[i],0)
              vnameV<-c(vnameV,tmp.NM)
              vlabelV<-c(vlabelV,paste(vlabelV[vnameV==xvname[i]],c("group","group trend")))
              vnameZ<-c(vnameZ,paste(tmp.NM[1],(1:sxf[i])-1,sep="."))
              vlabelZ<-c(vlabelZ,paste(tmp.low,"-",tmp.upp))
          } else {
              t.xname<-c(t.xname,xvname[i]); t.xlv<-c(t.xlv,xlv[i])
          }
       }
       xvname<-t.xname[-1]; xlv<-t.xlv[-1];
   }
}
rm(xv,yv,bv,av,sv,colv,v.start,v.stop)
if (!is.na(subjvname)) {
  if (!is.na(avname[1])) saf<-rep(0,length(saf));
  if (!is.na(svname[1])) sdf<-rep(0,length(sdf));
  WD<-WD[order(WD[,subjvname]),];
}
fmlm<-" "; fmlb<-"Non-adjusted"; tmp<-""; adjvv<-list(NA); adjvb<-"None";
fmlp<-ifelse(!is.na(subjvname), "gee", "glm");
na=0; avb=""; smoothav<-0; nadjm<-0
if (!is.na(avname[1])) {
   na<-length(avname)
   avb<-vlabelV[match(avname,vnameV)];
   avname_ <- avname
   smoothavi<-((saf=="s" | saf=="S") & alv==0)
   smoothav<-sum(smoothavi)
   smoothavname<-avname[smoothavi]
```

```
   avname_[smoothavi]<-paste("s(",avname[smoothavi],")",sep="")
   avb1<-avb
   avb1[smoothavi]<-paste(avb[smoothavi],"(Smooth)",sep="")
   avname_[alv>0]<-paste("factor(",avname[alv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(avname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"I"); adjvv[[nadjm+1]]<-avname;
   adjvb<-c(adjvb, paste(avb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothav>0, "gam", "glm")))
}
ns=0; svb=""; smoothsv<-0
if (!is.na(svname[1])) {
   svb<-vlabelV[match(svname,vnameV)];
   svname_ <- svname
   smoothsvi<-((sdf=="s" | sdf=="S") & slv==0)
   smoothsv<-sum(smoothsvi)
   smoothsvname<-svname[smoothsvi]
   svname_[smoothsvi]<-paste("s(",svname[smoothsvi],")",sep="")
   svb1<-svb
   svb1[smoothsvi]<-paste(svb[smoothsvi],"(Smooth)",sep="")
   svname_[slv>0]<-paste("factor(",svname[slv>0],")",sep="")
   fmlm<-c(fmlm,paste("+",paste(svname_,collapse="+")))
   fmlb<-c(fmlb,"Adjust")
   nadjm<-nadjm+1; tmp<-c(tmp,"II"); adjvv[[nadjm+1]]<-svname
   adjvb<-c(adjvb, paste(svb1, collapse="; "))
   fmlp<-c(fmlp,ifelse(!is.na(subjvname), "gee", ifelse(smoothsv>0, "gam", "glm")))
}
if (is.na(parm[1]) & length(fmlm)>1) {
   fmlm<-fmlm[-1]; fmlb<-fmlb[-1]; tmp<-tmp[-1]; adjvv<-adjvv[-1]; adjvb<-adjvb[-1]; fmlp<-
fmlp[-1];
}
if (nadjm>1) fmlb<-paste(fmlb,tmp)
nmdl<-length(fmlm)

ny=length(yvname); nx=length(xvname);
xb<-vlabelV[match(xvname,vnameV)]; xb[is.na(xb)]<-xvname[is.na(xb)]
yb<-vlabelV[match(yvname,vnameV)]; yb[is.na(yb)]<-yvname[is.na(yb)]
xvname_ <- xvname
xvname_[xlv>0]<-paste("factor(",xvname[xlv>0],")",sep="")
xxname_<-list(NA); xxlbl_<-list(NA); xxlvl_<-list(NA)
for (j in (1:nx)) {
   if (xlv[j]==0) {
      xxname_[[j+1]]<-xvname[j];xxlbl_[[j+1]]<-xb[j];xxlvl_[[j+1]]<-0
   } else {
```

```
      xxlvl_[[j+1]]<-levels(factor(WD[,xvname[j]]))
      tmp<-paste(xvname[j],".",xxlvl_[[j+1]],sep="")
      xxlbl_[[j+1]]<-c(xb[j],vlabelZ[match(tmp,vnameZ)])
      xxlbl_[[j+1]]<-paste(c("",rep("  ",length(xxlbl_[[j+1]])-1)),xxlbl_[[j+1]])
      xxname_[[j+1]]<-c(xvname[j],paste("factor(",xvname[j],")",xxlvl_[[j+1]],sep=""))
   }
}
xxname_<-xxname_[-1]; xxlbl_<-xxlbl_[-1]; xxlvl_<-xxlvl_[-1];
if (nx==1) par1<-1;
if (is.na(par1)) par1<-1;
if (par1>1) {
   tmp1<-xxname_[[1]]; tmp2<-xxlbl_[[1]]
   for (j in 2:nx) {tmp1<-c(tmp1,xxname_[[j]]); tmp2<-c(tmp2,xxlbl_[[j]]);}
   xxname_[[nx+1]]<-tmp1; xxlbl_[[nx+1]]<-tmp2;
   xvname_<-c(xvname_,paste(xvname_,collapse="+"))
}
contx<-(sum(xlv>0)==0)
if (par1==3 & !is.na(bvar)) {w<-c(w,"</br>Column stratified variable was ignored"); bvar<-NA;
bvname<-NA;}

if (is.na(bvar) & !is.na(colvname) & nmdl==1 & par1!=3) {if ((ny==1) | (nx==1 & contx)) {bvar<-
colvname; colvname<-NA;}}
if (is.na(colvname)) {
   nclv<-1; clvb<-"Total"; clvb_<-"Total"
} else {
   clv<-levels(factor(WD[,colvname])); nclv<-length(clv)+1
   clvb_<-vlabelZ[match(paste(colvname,".",clv,sep=""),vnameZ)];          clvb_[is.na(clvb_)]<-
clv[is.na(clvb_)];
   clvb<-c(paste(vlabelV[vnameV==colvname],clvb_,sep="="),"Total");
   clvb_<-c(clvb_,"Total")
   WD<-WD[!is.na(WD[,colvname]),]
}
if (is.na(bvar)) {
   blvb<-"Total"; blvb_<-"Total"
} else {
   blv<-levels(factor(WD[,bvar])); nblv<-length(blv)+1
   blvb_<-vlabelZ[match(paste(bvar,".",blv,sep=""),vnameZ)];          blvb_[is.na(blvb_)]<-
blv[is.na(blvb_)];
   blvb<-c(paste(vlabelV[vnameV==bvar],blvb_,sep="="),"Total");
   blvb_<-c(blvb_,"Total")
   WD<-WD[!is.na(WD[,bvar]),]
}
aa<-c(1,2,3,4)
for (i in 1:4) {
```

```
        for (j in c(1:4)[-i]) {
            for (k in c(1:4)[-c(i,j)]) aa<-rbind(aa,c(i,j,k,c(1:4)[-c(i,j,k)]))
        }
}
if (is.na(parm[4])) parm[4]<-1
rord<-aa[parm[4],]
if (!is.na(bvar)) {prn<-"S";
} else {
   if (parm[4]>1) {
      rordc<-ifelse(rord[4]==1,3,4)
      prn<-c("G","Y","M","X")[rord[rordc]]
      if (prn=="X") {
         if (!contx & nx>1) prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
         if (!contx & nx==1) prn<-"CX"
         if (par1==2) {tmp<-ifelse(rordc==4,ifelse(rord[3]==1,2,3),2); prn<-
c("G","Y","M","X")[rord[tmp]];}
      }
   } else {
      prn<-ifelse(nmdl>1, "M", ifelse(ny>nx & contx, "X", "Y"))
      if (par1==2) prn<-ifelse(nmdl>1, "M", "Y")
   }
   if (par1==3) prn<-"UM"
}
colprn<-parm[3];
sink(paste(ofname,".lst",sep=""))
if (par1==2) {xbgn<-nx+1; xend<-nx+1;} else {xbgn<-1; xend<-nx;}
if (prn=="Y") {
   tt<-c(0,0,0,0,"Exposure",yb); nn<-c(0,0,0,0,yb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (j in (xbgn:xend)) {
            colj<-cbind(k,0,m,j,xxlbl_[[j]])
            nnj <-c(k,0,m,j)
            for (i in (1:ny)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
```

```
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
  }
  if (prn=="S") {
    tt<-c(0,0,0,0,"Exposure",blvb); nn<-c(0,0,0,0,blvb);
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in (1:ny)) {
        for (m in 1:nmdl) {
          for (j in (xbgn:xend)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]);
            nnj <- c(k,i,m,j)
            for (b in (1:nblv)) {
              print(paste("Stratified by",bvar, ":", blvb[b]))
              fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
              if (b<nblv) {
                wdtmp1<-wdtmp0[wdtmp0[,bvar]==blv[b],];
              } else {
                wdtmp1<-wdtmp0; fml<-paste(fml,"+factor(",bvar,")",sep="");
              }
              wdtmp<-removeNA(i,j,m,wdtmp1)
              if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
              if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
              if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
              if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
              tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
              colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
          }
        }
      }
    }
  }
```

```
if (prn=="M") {
   tt<-c(0,0,0,0,"Exposure",fmlb);    nn<-c(0,0,0,0,fmlb)
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (i in 1:ny) {
         for (j in xbgn:xend) {
            colj<-cbind(k,i,0,j,xxlbl_[[j]]); nnj<-c(k,i,0,j)
            for (m in 1:nmdl) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
               if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
               tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
               colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            }
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
         }
      }
   }
}
if (prn=="X") {
   tt<-c(0,0,0,0,"Outcome",xb); nn<-c(0,0,0,0,xb);
   for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
         if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
         print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
         for (i in (1:ny)) {
            colj<-cbind(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            for (j in (1:nx)) {
               fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
               wdtmp<-removeNA(i,j,m,wdtmp0)
               if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
               if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
               if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
```

```
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
          }
          tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="CX") {
    tt<-c(0,0,0,0,"Outcome",xxlbl_[[1]][-1]); nn<-c(0,0,0,0,xb[1]);
    nxl<-length(xxlbl_[[1]])-1
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
      for (m in 1:nmdl) {
        for (i in (1:ny)) {
            colj<-c(k,i,m,0,yb[i])
            nnj <-c(k,i,m,0)
            fml<-paste(yvname[i],"~",xvname_[1],fmlm[m]);
            wdtmp<-removeNA(i,1,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[1]],fmlp[m])
            colj<-c(colj,tmpooi[[1]][-1]); nnj<-c(nnj,tmpooi[[2]])
            tt<-rbind(tt,colj); nn<-rbind(nn,nnj)
        }
      }
    }
}
if (prn=="UM") {
    tt<-c(0,0,0,0,"Exposure","Univariable","Multivariable");                    nn<-
c(0,0,0,0,"Univariable","Multivariable")
    for (k in (1:nclv)) {
      wdtmp0<-WD;
      if (!is.na(colvname)) {
        if (k<nclv) wdtmp0<-WD[WD[,colvname]==clv[k],];
        print(paste("Stratified by",colvname, ":", clvb[k]))
      }
```

```
      for (i in 1:ny) {
        for (m in 1:nmdl) {
          colm<-rep(NA,6); nnm<-rep(NA,5)
          for (j in 1:(nx+1)) {
            colj<-cbind(k,i,m,j,xxlbl_[[j]]); nnj<-c(k,i,m,j)
            fml<-paste(yvname[i],"~",xvname_[j],fmlm[m]);
            wdtmp<-removeNA(i,j,m,wdtmp0)
            if (!is.na(colvname)) {if (k==nclv) fml<-paste(fml,"+factor(",colvname,")",sep="");}
            if (fmlp[m]=="gam") tmp.mdl<-setgam(fml,i)
            if (fmlp[m]=="gee") tmp.mdl<-setgee(fml,i)
            if (fmlp[m]=="glm") tmp.mdl<-setglm(fml,i)
            tmpooi<-mdl2oo(tmp.mdl,xxname_[[j]],fmlp[m])
            colj<-cbind(colj,tmpooi[[1]]); nnj<-c(nnj,tmpooi[[2]])
            if (j<=nx) {colm<-rbind(colm,colj); nnm<-rbind(nnm,nnj);
            } else {colm<-cbind(colm[-1,],tmpooi[[1]]); nnm<-cbind(nnm[-1,],tmpooi[[2]]);}
          }
          tt<-rbind(tt,colm); nn<-rbind(nn,nnm)
        }
      }
    }
}
sink()
if (!contx & prn!="CX") rord<-c(rord[rord!=4],4)
if (prn=="X" | prn=="CX") rord<-rord[rord!=4]
if (prn=="Y") rord<-rord[rord!=2]
if (prn=="M") rord<-rord[rord!=3]
if (nx==1 & contx) rord<-rord[rord!=4]
if (nmdl==1) rord<-rord[rord!=3]
if (ny==1) rord<-rord[rord!=2]
if (is.na(colvname)) rord<-rord[rord!=1]
if (length(rord)==0) rord<-1
nrr<-length(rord)
for (i in nrr:1) {nn<-nn[order(as.numeric(nn[,rord[i]])),];tt<-tt[order(as.numeric(tt[,rord[i]])),];}
if (nn[2,4]>0) {nn[,4]<-c("Exposure",xb[as.numeric(nn[-1,4])]); } else {nn<-nn[,-4];}
if (nn[2,3]>0) {nn[,3]<-c("Model",fmlb[as.numeric(nn[-1,3])]); } else {nn<-nn[,-3];}
if (nn[2,2]>0) {nn[,2]<-c("Outcome",yb[as.numeric(nn[-1,2])]); } else {nn<-nn[,-2];}
if (!is.na(colvname)) {nn[,1]<-c(vlabel[vname==colvname],clvb_[as.numeric(nn[-1,1])]);} else
{nn<-nn[,-1];}
tb<-matrix(as.numeric(tt[,c(1:4)]),ncol=4);
if (!is.na(colvname)) {tt[,1]<-c(vlabelV[vnameV==colvname],clvb[tb[-1,1]]);}
if (ny>1) {tt[,2]<-c("Outcome",yb[tb[-1,2]]);}
if (nmdl>1) {tt[,3]<-c("Model",fmlb[tb[-1,3]]);}
nrr1<-nrr-1; oo<-tt[1,]; nc<-ncol(tt)-5; nr<-nrow(tt)
for (i in 2:nr) {
```

```
    if (nrr>1) {
      for (j in 1:nrr1) {
        if (tb[i,rord[j]]!=tb[i-1,rord[j]]) oo<-rbind(oo,c(rep(tt[i,rord[j]],5),rep(" ",nc)))
      }
    }
    oo<-rbind(oo,tt[i,])
}
if (rord[nrr]!=4 & tt[1,rord[nrr]]!="0") {oo<-cbind(oo[,rord[nrr]],oo[,-(1:5)]);} else {oo<-oo[,-(1:4)]}
w<-c(w,paste("<h2>", title, "</h2>"))
w<-c(w,"</br><table border=3>", mat2htmltable(oo), "</table>")
prnopt<-c("β (95%CI) Pvalue / OR (95%CI) Pvalue", "β (95%CI) Pvalue", "β+se / OR (95%CI)
*P<0.05 **P<0.01 ***P<0.001")
```