###Script used for the manuscript "Urban blackbirds have shorter telomeres" by J.D. Ibáñez-Álamo, J. Pineda-Pampliega, R.L. Thomson, J.I. Aguirre, A. Díez-Fernández, B. Faivre, J. Figuerola and S. Verhulst. 2018. Biology Letters 20180083.

```
library(Matrix)
library(lme4)
library(lmerTest)

##Analyses for yearlings
table1<-Telomeres_yearlings
View(table1)
head(table1)
str(table1)
table1$Population<-as.factor(table1$Population)
table1$Gel_ID<-as.factor(table1$"Gel_ID")
table1$Telomere_Length_bp<-as.numeric(table1$Telomere_Length_bp)

#Backward stepwise procedure for yearlings
mod1<-
lmer(Telomere_Length_bp~Habitat+(1|Dyad/Population)+Sex+(1|Gel_ID)+Habitat:Sex,data=ta
ble1,na.action=na.omit)
plot(residuals(mod1))
anova(mod1)
summary(mod1)

mod2<-
lmer(Telomere_Length_bp~Habitat+(1|Dyad/Population)+Sex+(1|Gel_ID),data=table1,na.acti
on=na.omit)
plot(residuals(mod2))
anova(mod2)
summary(mod2)

mod3<-
lmer(Telomere_Length_bp~Habitat+(1|Dyad/Population)+(1|Gel_ID),data=table1,na.action=n
a.omit)
plot(residuals(mod3))
anova(mod3)
summary(mod3)

##Analyses for older blackbirds
table2<- Telomeres_older
View(table2)
head(table2)
str(table2)
table2$Population<-as.factor(table2$Population)
table2$Gel_ID<-as.factor(table2$"Gel_ID")
table2$Telomere_Length_bp<-as.numeric(table2$Telomere_Length_bp)

mod4<-
lmer(Telomere_Length_bp~Habitat+(1|Dyad/Population)+(1|Gel_ID),data=table2,na.action=n
a.omit)
```

```
plot(residuals(mod4))
anova(mod4)
summary(mod4)

##Age ratio analyses
library(nlme)
table3<-Age_ratio
View(table3)
head(table3)
str(table3)
table3$Sex<-as.factor(table3$Sex)
table3$Age<-as.factor(table3$Age)
table3$Habitat<-as.factor(table3$Habitat)
table3$Population<-as.factor(table3$Population)
table3$Dyad<-as.factor(table3$Dyad)

#Backward stepwise procedure for age ratio
mod5 <- glmer(Age ~ Habitat + Sex + Sex:Habitat + (1|Dyad/Population), data = table3, family =
binomial(link= "logit"), na.action = na.omit)
summary(mod5)

mod6 <- glmer(Age ~ Habitat + Sex + (1|Dyad/Population), data = table3, family =
binomial(link= "logit"), na.action = na.omit)
summary(mod6)

mod7 <- glmer(Age ~ Habitat + (1|Dyad/Population), data = table3, family = binomial(link=
"logit"), na.action = na.omit)
summary(mod7)
```