National Survey Statistics Report

Summary

- Question – For each of the questions, 1-10, are there differences in the average response by age?

  Answer – YES, for ALL questions there are significant differences among the responses of the various age groups

- Question – For each of the questions, 1-10, are there differences in the average response by gender?

  Answer – YES, for ALL questions there are significant differences between the responses of the genders.

- Question – For each of the questions, 1-10, are there differences in the average response by income level?

  Answer – YES, for questions 1, 2, 3, 4, and 6 there are differences in responses among income levels.

- Question: For each of the questions, are there differences in the average responses among regions?

  Answer – YES, but only for question 9.

- Question – For each of the questions, 1-10, are there differences in the average responses among the devices used?
  Answer – Yes, for all questions, except 2, 8 and 9, there are differences in the average responses among the devices used.

Statistics

- Question – For each of the questions, 1-10, are there differences in the average response by age among those who identified their age group?

```
. dunntest iq1, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 136808.00 |
  |    3 | 230 | 120095.00 |
  |    4 | 343 | 193579.00 |
  |    5 | 197 | 119296.00 |
  +------------------------+

chi-squared =    31.130 with 3 d.f.
probability =     0.0001

chi-squared with ties =    53.379 with 3 d.f.
probability =     0.0001


                 Dunn's Pairwise Comparison of iq1 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
```

```
---------+---------------------------------
       3 |  -2.976209
         |     0.0022
         |
       4 |  -5.561425  -2.104981
         |     0.0000     0.0212
         |
       5 |  -6.702295  -3.651101  -1.958054
         |     0.0000     0.0003     0.0251

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq2, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 137489.50 |
  |    3 | 230 | 117935.00 |
  |    4 | 343 | 193709.50 |
  |    5 | 197 | 120644.00 |
  +------------------------+

chi-squared =    33.059 with 3 d.f.
probability =     0.0001

chi-squared with ties =    47.662 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq2 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
---------+---------------------------------
       3 |  -2.210640
         |     0.0162
         |
       4 |  -5.005456  -2.376918
         |     0.0000     0.0131
         |
       5 |  -6.338529  -3.999461  -2.077098
         |     0.0000     0.0001     0.0189

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq3, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 139770.50 |
  |    3 | 230 | 117843.00 |
  |    4 | 343 | 191441.00 |
  |    5 | 197 | 120723.50 |
  +------------------------+

chi-squared =    28.691 with 3 d.f.
probability =     0.0001

chi-squared with ties =    53.833 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq3 by iage
```

```
                          (Benjamini-Hochberg)
Col Mean-|
Row Mean |              2              3              4
---------+------------------------------------
       3 |   -2.113003
         |      0.0173
         |
       4 |   -4.908660   -2.387522
         |      0.0000      0.0102
         |
       5 |   -6.879036   -4.599409   -2.718488
         |      0.0000      0.0000      0.0049

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq4, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 131759.50 |
  |    3 | 230 | 116810.50 |
  |    4 | 343 | 196304.50 |
  |    5 | 197 | 124903.50 |
  +------------------------+

chi-squared =    53.252 with 3 d.f.
probability =     0.0001

chi-squared with ties =    70.467 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq4 by iage
                          (Benjamini-Hochberg)
Col Mean-|
Row Mean |              2              3              4
---------+------------------------------------
       3 |   -2.730052
         |      0.0038
         |
       4 |   -6.060387   -2.822725
         |      0.0000      0.0036
         |
       5 |   -7.734777   -4.851098   -2.576905
         |      0.0000      0.0000      0.0050

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq5, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 130735.50 |
  |    3 | 230 | 118988.50 |
  |    4 | 343 | 197372.50 |
  |    5 | 197 | 122681.50 |
  +------------------------+

chi-squared =    50.736 with 3 d.f.
probability =     0.0001

chi-squared with ties =    74.894 with 3 d.f.
probability =     0.0001
```

```
                Dunn's Pairwise Comparison of iq5 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |              2              3              4
---------+----------------------------------
       3 |  -3.463252
         |     0.0004
         |
       4 |  -6.727241  -2.687273
         |     0.0000     0.0043
         |
       5 |  -7.833291  -4.280955  -2.086904
         |     0.0000     0.0000     0.0184

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq6, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 139523.00 |
  |    3 | 230 | 121315.50 |
  |    4 | 343 | 196979.50 |
  |    5 | 197 | 111960.00 |
  +------------------------+

chi-squared =    21.310 with 3 d.f.
probability =     0.0001

chi-squared with ties =    31.684 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq6 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |              2              3              4
---------+----------------------------------
       3 |  -2.598612
         |     0.0094
         |
       4 |  -5.217225  -2.174021
         |     0.0000     0.0223
         |
       5 |  -4.243787  -1.665690   0.263774
         |     0.0000     0.0575     0.3960

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq7, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 134994.00 |
  |    3 | 230 | 118404.00 |
  |    4 | 343 | 195415.00 |
  |    5 | 197 | 120965.00 |
  +------------------------+

chi-squared =    38.545 with 3 d.f.
probability =     0.0001
```

```
chi-squared with ties =    47.396 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq7 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
---------+---------------------------------
       3 |  -2.469339
         |     0.0102
         |
       4 |  -5.229834  -2.318978
         |     0.0000     0.0122
         |
       5 |  -6.246620  -3.678399  -1.783685
         |     0.0000     0.0002     0.0372

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq8, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 144264.00 |
  |    3 | 230 | 123659.00 |
  |    4 | 343 | 195323.50 |
  |    5 | 197 | 106531.50 |
  +------------------------+

chi-squared =    11.953 with 3 d.f.
probability =     0.0075

chi-squared with ties =    13.243 with 3 d.f.
probability =     0.0041


                Dunn's Pairwise Comparison of iq8 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
---------+---------------------------------
       3 |  -2.018706
         |     0.0435
         |
       4 |  -3.607781  -1.274845
         |     0.0009     0.1518
         |
       5 |  -2.045700  -0.109821   1.096108
         |     0.0612     0.4563     0.1638

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq9, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 145982.00 |
  |    3 | 230 | 123673.00 |
  |    4 | 343 | 185055.00 |
  |    5 | 197 | 115068.00 |
  +------------------------+
```

```
chi-squared =    10.994 with 3 d.f.
probability =     0.0118

chi-squared with ties =    12.738 with 3 d.f.
probability =     0.0052


                Dunn's Pairwise Comparison of iq9 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
---------+---------------------------------
       3 |  -1.836776
         |     0.0662
         |
       4 |  -2.115200  -0.074195
         |     0.0516     0.4704
         |
       5 |  -3.519369  -1.669304  -1.742007
         |     0.0013     0.0570     0.0611

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq10, by(iage) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +------------------------+
  | iage | Obs |  Rank Sum |
  |------+-----+-----------|
  |    2 | 297 | 134627.00 |
  |    3 | 230 | 122540.00 |
  |    4 | 343 | 194647.50 |
  |    5 | 197 | 117963.50 |
  +------------------------+

chi-squared =    33.137 with 3 d.f.
probability =     0.0001

chi-squared with ties =    60.194 with 3 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq10 by iage
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |             2             3             4
---------+---------------------------------
       3 |  -3.958265
         |     0.0001
         |
       4 |  -6.301218  -1.780890
         |     0.0000     0.0450
         |
       5 |  -6.925950  -2.974246  -1.532010
         |     0.0000     0.0022     0.0628

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

------------------------------------------------------------------------------------------------------------------------
```

- Question – For each of the questions, 1-10, are there differences in the average response by gender?

```
. dunntest iq1, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +--------------------------+
```

```
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 248163.00 |
  |       2 | 570 | 321615.00 |
  +---------------------------+

chi-squared =    11.781 with 1 d.f.
probability =     0.0006

chi-squared with ties =    20.202 with 1 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq1 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.494629
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq2, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 245930.00 |
  |       2 | 570 | 323848.00 |
  +---------------------------+

chi-squared =    15.032 with 1 d.f.
probability =     0.0001

chi-squared with ties =    21.672 with 1 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq2 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.655324
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq3, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 254937.00 |
  |       2 | 570 | 314841.00 |
  +---------------------------+

chi-squared =     4.340 with 1 d.f.
probability =     0.0372

chi-squared with ties =     8.144 with 1 d.f.
probability =     0.0043
```

```
               Dunn's Pairwise Comparison of iq3 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -2.853738
         |     0.0022

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq4, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 245219.00 |
  |       2 | 570 | 324559.00 |
  +---------------------------+

chi-squared =    16.150 with 1 d.f.
probability =     0.0001

chi-squared with ties =    21.371 with 1 d.f.
probability =     0.0001


               Dunn's Pairwise Comparison of iq4 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.622902
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq5, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 250255.00 |
  |       2 | 570 | 319523.00 |
  +---------------------------+

chi-squared =     9.095 with 1 d.f.
probability =     0.0026

chi-squared with ties =    13.426 with 1 d.f.
probability =     0.0002


               Dunn's Pairwise Comparison of iq5 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -3.664079
         |     0.0001

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq6, by(igender)
```

```
Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 253170.50 |
  |       2 | 570 | 316607.50 |
  +---------------------------+

chi-squared =     5.930 with 1 d.f.
probability =     0.0149

chi-squared with ties =     8.817 with 1 d.f.
probability =     0.0030


                Dunn's Pairwise Comparison of iq6 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -2.969281
         |     0.0015

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq7, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 242886.00 |
  |       2 | 570 | 326892.00 |
  +---------------------------+

chi-squared =    20.100 with 1 d.f.
probability =     0.0001

chi-squared with ties =    24.716 with 1 d.f.
probability =     0.0001


                Dunn's Pairwise Comparison of iq7 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.971520
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq8, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 243180.50 |
  |       2 | 570 | 326597.50 |
  +---------------------------+
```

```
chi-squared =    19.578 with 1 d.f.
probability =     0.0001

chi-squared with ties =    21.691 with 1 d.f.
probability =     0.0001


               Dunn's Pairwise Comparison of iq8 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.657396
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq9, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 250477.00 |
  |       2 | 570 | 319301.00 |
  +---------------------------+

chi-squared =     8.830 with 1 d.f.
probability =     0.0030

chi-squared with ties =    10.231 with 1 d.f.
probability =     0.0014


               Dunn's Pairwise Comparison of iq9 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -3.198645
         |     0.0007

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq10, by(igender)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | igender | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 497 | 246943.50 |
  |       2 | 570 | 322834.50 |
  +---------------------------+

chi-squared =    13.508 with 1 d.f.
probability =     0.0002

chi-squared with ties =    24.537 with 1 d.f.
probability =     0.0001


              Dunn's Pairwise Comparison of iq10 by igender
                              (No adjustment)
Col Mean-|
Row Mean |             1
---------+-----------
       2 |  -4.953449
```

```
         |     0.0000

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2
```

- Question – For each of the questions, 1-10, are there differences in the average response by income level?

```
. dunntest iq1, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  39647.00 |
  |       2 | 124 |  60999.00 |
  |       3 | 220 | 109906.00 |
  |       4 | 194 | 109253.00 |
  |       5 | 138 |  73959.00 |
  |---------+-----+-----------|
  |       6 |  81 |  47674.00 |
  |       7 |  45 |  26205.00 |
  |       8 |  29 |  18958.00 |
  |       9 |  13 |   7766.00 |
  |      10 |  22 |  13681.00 |
  |---------+-----+-----------|
  |      11 | 116 |  61730.00 |
  +---------------------------+

chi-squared =    21.252 with 10 d.f.
probability =     0.0194

chi-squared with ties =    36.441 with 10 d.f.
probability =     0.0001


               Dunn's Pairwise Comparison of iq1 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -0.769253
         |     0.2209
         |
       3 |  -1.102569  -0.289304
         |     0.1351     0.3862
         |
       4 |  -3.159808  -2.632641  -2.743449
         |     0.0008     0.0042     0.0030
         |
       5 |  -2.141875  -1.511267  -1.422898   1.038856
         |     0.0161     0.0654     0.0774     0.1494
         |
       6 |  -3.342301  -2.874429  -2.909733  -0.816141  -1.597847
         |     0.0004     0.0020     0.0018     0.2072     0.0550
         |
       7 |  -2.671383  -2.207428  -2.149485  -0.492410  -1.148526   0.142490
         |     0.0038     0.0136     0.0158     0.3112     0.1254     0.4433
         |
       8 |  -3.700701  -3.333112  -3.315692  -1.932950  -2.450205  -1.279432
         |     0.0001     0.0004     0.0005     0.0266     0.0071     0.1004
         |
       9 |  -1.868475  -1.537144  -1.456172  -0.507627  -0.900035  -0.125393
         |     0.0308     0.0621     0.0727     0.3059     0.1841     0.4501
         |
      10 |  -2.761056  -2.386668  -2.323942  -1.108837  -1.590545  -0.588491
         |     0.0029     0.0085     0.0101     0.1338     0.0559     0.2781
         |
      11 |  -1.955930  -1.323354  -1.206620   1.122513   0.127501   1.655509
         |     0.0252     0.0929     0.1138     0.1308     0.4493     0.0489
Col Mean-|
Row Mean |       7          8          9          10
```

```
---------+--------------------------------------------
       8 |  -1.273936
         |     0.1013
         |
       9 |  -0.203120   0.717258
         |     0.4195     0.2366
         |
      10 |  -0.645693   0.478844  -0.297344
         |     0.2592     0.3160     0.3831
         |
      11 |   1.214096   2.488185   0.947688   1.639269
         |     0.1124     0.0064     0.1716     0.0506

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq2, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  39413.00 |
  |       2 | 124 |  62680.50 |
  |       3 | 220 | 113218.00 |
  |       4 | 194 | 104957.50 |
  |       5 | 138 |  77734.00 |
  |---------+-----+-----------|
  |       6 |  81 |  46268.50 |
  |       7 |  45 |  27142.00 |
  |       8 |  29 |  14295.00 |
  |       9 |  13 |   8091.00 |
  |      10 |  22 |  12619.00 |
  |---------+-----+-----------|
  |      11 | 116 |  63359.50 |
  +---------------------------+

chi-squared =    13.281 with 10 d.f.
probability =     0.2084

chi-squared with ties =    19.148 with 10 d.f.
probability =     0.0384


               Dunn's Pairwise Comparison of iq2 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -1.156759
         |     0.1237
         |
       3 |  -1.554296  -0.317118
         |     0.0601     0.3756
         |
       4 |  -2.316595  -1.204085  -1.044061
         |     0.0103     0.1143     0.1482
         |
       5 |  -2.814820  -1.820137  -1.746089  -0.779272
         |     0.0024     0.0344     0.0404     0.2179
         |
       6 |  -2.698388  -1.792626  -1.696535  -0.889441  -0.220641
         |     0.0035     0.0365     0.0449     0.1869     0.4127
         |
       7 |  -2.947791  -2.186686  -2.108330  -1.463268  -0.904860  -0.669351
         |     0.0016     0.0144     0.0175     0.0717     0.1828     0.2516
         |
       8 |  -0.529937   0.237196   0.427915   0.941103   1.342026   1.409567
         |     0.2981     0.4063     0.3344     0.1733     0.0898     0.0793
         |
       9 |  -2.076410  -1.562379  -1.471004  -1.106612  -0.793658  -0.667291
         |     0.0189     0.0591     0.0706     0.1342     0.2137     0.2523
         |
      10 |  -1.790286  -1.147028  -1.027451  -0.564161  -0.174837  -0.038489
```

```
          |     0.0367     0.1257     0.1521     0.2863     0.4306     0.4846
          |
       11 |  -2.251971  -1.228138  -1.072211  -0.172116   0.528550   0.673092
          |     0.0122     0.1097     0.1418     0.4317     0.2986     0.2504
Col Mean-|
Row Mean |       7          8          9          10
---------+--------------------------------------------
        8 |   1.803556
          |     0.0357
          |
        9 |  -0.237949  -1.511200
          |     0.4060     0.0654
          |
       10 |   0.442807  -1.111590   0.543469
          |     0.3290     0.1332     0.2934
          |
       11 |   1.263574  -0.999773   1.014893   0.458911
          |     0.1032     0.1587     0.1551     0.3231

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq3, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  38988.50 |
  |       2 | 124 |  65318.50 |
  |       3 | 220 | 111481.50 |
  |       4 | 194 | 108216.50 |
  |       5 | 138 |  75233.00 |
  |---------+-----+-----------|
  |       6 |  81 |  46445.50 |
  |       7 |  45 |  26126.00 |
  |       8 |  29 |  16689.00 |
  |       9 |  13 |   8034.00 |
  |      10 |  22 |  13280.50 |
  |---------+-----+-----------|
  |      11 | 116 |  59965.00 |
  +---------------------------+

chi-squared =    13.531 with 10 d.f.
probability =     0.1955

chi-squared with ties =    25.388 with 10 d.f.
probability =     0.0047


               Dunn's Pairwise Comparison of iq3 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |        1          2          3          4          5          6
---------+------------------------------------------------------------------------
       2 |  -2.148829
          |     0.0158
          |
       3 |  -1.672250   0.792784
          |     0.0472     0.2140
          |
       4 |  -3.387523  -1.200612  -2.305484
          |     0.0004     0.1150     0.0106
          |
       5 |  -2.787910  -0.661150  -1.573197   0.504950
          |     0.0027     0.2543     0.0578     0.3068
          |
       6 |  -3.283862  -1.451113  -2.280115  -0.523645  -0.896635
          |     0.0005     0.0734     0.0113     0.3003     0.1850
          |
       7 |  -2.938900  -1.374539  -2.006238  -0.611462  -0.916926  -0.171575
          |     0.0016     0.0846     0.0224     0.2704     0.1796     0.4319
          |
       8 |  -2.414087  -1.049909  -1.546854  -0.394415  -0.659672  -0.042756
```

```
          |     0.0079     0.1469     0.0609     0.3466     0.2547     0.4829
          |
        9 |  -2.377882  -1.391143  -1.732772  -0.933760  -1.115905  -0.663510
          |     0.0087     0.0821     0.0416     0.1752     0.1322     0.2535
          |
       10 |  -2.693915  -1.477507  -1.926749  -0.905783  -1.132569  -0.559433
          |     0.0035     0.0698     0.0270     0.1825     0.1287     0.2879
          |
       11 |  -1.813516   0.338009  -0.395350   1.548125   0.996072   1.733268
          |     0.0349     0.3677     0.3463     0.0608     0.1596     0.0415
Col Mean-|
Row Mean |       7          8          9         10
---------+--------------------------------------------
        8 |   0.095106
          |     0.4621
          |
        9 |  -0.528284  -0.566220
          |     0.2987     0.2856
          |
       10 |  -0.394380  -0.442980   0.182222
          |     0.3467     0.3289     0.4277
          |
       11 |   1.610698   1.253413   1.535893   1.657645
          |     0.0536     0.1050     0.0623     0.0487

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq4, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  37107.00 |
  |       2 | 124 |  65210.00 |
  |       3 | 220 | 110440.00 |
  |       4 | 194 | 111545.50 |
  |       5 | 138 |  75994.50 |
  |---------+-----+-----------|
  |       6 |  81 |  42547.50 |
  |       7 |  45 |  27401.50 |
  |       8 |  29 |  15829.50 |
  |       9 |  13 |   7802.00 |
  |      10 |  22 |  13522.00 |
  |---------+-----+-----------|
  |      11 | 116 |  62378.50 |
  +---------------------------+

chi-squared =    19.683 with 10 d.f.
probability =     0.0324

chi-squared with ties =    26.046 with 10 d.f.
probability =     0.0037


               Dunn's Pairwise Comparison of iq4 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -2.368171
         |     0.0089
         |
       3 |  -1.912976   0.794063
         |     0.0279     0.2136
         |
       4 |  -3.972534  -1.593812  -2.765956
         |     0.0000     0.0555     0.0028
         |
       5 |  -3.089953  -0.748099  -1.673598   0.814298
         |     0.0010     0.2272     0.0471     0.2077
         |
       6 |  -2.133003   0.015921  -0.668591   1.402405   0.677582
```

```
          |     0.0165     0.4936     0.2519     0.0804     0.2490
          |
        7 |  -3.490216  -1.781082  -2.439558  -0.765840  -1.266400  -1.679380
          |     0.0002     0.0374     0.0074     0.2219     0.1027     0.0465
          |
        8 |  -1.897109  -0.361180  -0.828471   0.546218   0.088444  -0.354785
          |     0.0289     0.3590     0.2037     0.2925     0.4648     0.3614
          |
        9 |  -2.050700  -0.950966  -1.283692  -0.328050  -0.636509  -0.935496
          |     0.0201     0.1708     0.0996     0.3714     0.2622     0.1748
          |
       10 |  -2.779079  -1.432053  -1.880365  -0.658084  -1.039898  -1.387458
          |     0.0027     0.0761     0.0300     0.2552     0.1492     0.0827
          |
       11 |  -2.645686  -0.342701  -1.162901   1.184141   0.383446  -0.321426
          |     0.0041     0.3659     0.1224     0.1182     0.3507     0.3739
Col Mean-|
Row Mean |        7          8          9          10
---------+--------------------------------------------
        8 |   0.988807
          |     0.1614
          |
        9 |   0.103952  -0.607388
          |     0.4586     0.2718
          |
       10 |  -0.081994  -0.908257  -0.154540
          |     0.4673     0.1819     0.4386
          |
       11 |   1.512891   0.145623   0.796518   1.234306
          |     0.0652     0.4421     0.2129     0.1085

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq5, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  43091.50 |
  |       2 | 124 |  66453.50 |
  |       3 | 220 | 109374.50 |
  |       4 | 194 | 106261.50 |
  |       5 | 138 |  75463.00 |
  |---------+-----+-----------|
  |       6 |  81 |  44934.00 |
  |       7 |  45 |  24609.50 |
  |       8 |  29 |  17201.00 |
  |       9 |  13 |   8082.00 |
  |      10 |  22 |  13958.00 |
  |---------+-----+-----------|
  |      11 | 116 |  60349.50 |
  +---------------------------+

chi-squared =     9.564 with 10 d.f.
probability =     0.4796

chi-squared with ties =    14.118 with 10 d.f.
probability =     0.1677


               Dunn's Pairwise Comparison of iq5 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |             1             2             3             4             5             6
---------+------------------------------------------------------------------------------------
       2 |  -0.810736
         |     0.2088
         |
       3 |   0.302602   1.360806
         |     0.3811     0.0868
         |
       4 |  -1.236093  -0.405473  -2.024892
```

```
          |     0.1082     0.3426     0.0214
          |
        5 |  -1.140193  -0.347880  -1.803628   0.032089
          |     0.1271     0.3640     0.0356     0.4872
          |
        6 |  -1.213243  -0.519526  -1.746860  -0.208654  -0.222731
          |     0.1125     0.3017     0.0403     0.4174     0.4119
          |
        7 |  -0.853708  -0.248352  -1.198176   0.020538  -0.001021   0.166739
          |     0.1966     0.4019     0.1154     0.4918     0.4996     0.4338
          |
        8 |  -1.579954  -1.093750  -1.915503  -0.899027  -0.893698  -0.699570
          |     0.0571     0.1370     0.0277     0.1843     0.1857     0.2421
          |
        9 |  -1.518954  -1.160057  -1.720222  -1.017718  -1.017309  -0.883481
          |     0.0644     0.1230     0.0427     0.1544     0.1545     0.1885
          |
       10 |  -2.101410  -1.679350  -2.420832  -1.519726  -1.504827  -1.307239
          |     0.0178     0.0465     0.0077     0.0643     0.0662     0.0956
          |
       11 |  -0.367139   0.478014  -0.793637   0.923288   0.831911   0.939016
          |     0.3568     0.3163     0.2137     0.1779     0.2027     0.1739
Col Mean-|
Row Mean |              7              8              9             10
---------+--------------------------------------------
        8 |  -0.765919
          |     0.2219
          |
        9 |  -0.936777  -0.337291
          |     0.1744     0.3679
          |
       10 |  -1.327258  -0.576151  -0.143834
          |     0.0922     0.2823     0.4428
          |
       11 |   0.597686   1.384077   1.367391   1.936218
          |     0.2750     0.0832     0.0858     0.0264

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq6, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +----------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  39943.00 |
  |       2 | 124 |  65934.00 |
  |       3 | 220 | 112644.00 |
  |       4 | 194 | 111196.50 |
  |       5 | 138 |  76173.50 |
  |---------+-----+-----------|
  |       6 |  81 |  42432.00 |
  |       7 |  45 |  27899.50 |
  |       8 |  29 |  16523.00 |
  |       9 |  13 |   7017.00 |
  |      10 |  22 |  12425.00 |
  |---------+-----+-----------|
  |      11 | 116 |  57590.50 |
  +----------------------------+

chi-squared =    14.334 with 10 d.f.
probability =     0.1583

chi-squared with ties =    21.312 with 10 d.f.
probability =     0.0190


                Dunn's Pairwise Comparison of iq6 by iincome
                              (No adjustment)
Col Mean-|
Row Mean |       1          2           3          4          5         6
---------+------------------------------------------------------------------------
       2 |  -1.736761
```

```
          |     0.0412
          |
        3 |  -1.304384   0.694423
          |     0.0961     0.2437
          |
        4 |  -3.141146  -1.426563  -2.457107
          |     0.0008     0.0769     0.0070
          |
        5 |  -2.355036  -0.647742  -1.456204   0.753132
          |     0.0093     0.2586     0.0727     0.2257
          |
        6 |  -1.374388   0.218080  -0.360277   1.475366   0.795202
          |     0.0847     0.4137     0.3593     0.0701     0.2132
          |
        7 |  -3.220984  -2.006780  -2.611245  -1.119447  -1.567548  -2.045979
          |     0.0006     0.0224     0.0045     0.1315     0.0585     0.0204
          |
        8 |  -1.837011  -0.729574  -1.156479   0.067955  -0.344334  -0.839400
          |     0.0331     0.2328     0.1237     0.4729     0.3653     0.2006
          |
        9 |  -0.928093  -0.109172  -0.384708   0.461416   0.166563  -0.210799
          |     0.1767     0.4565     0.3502     0.3223     0.4339     0.4165
          |
       10 |  -1.569049  -0.565228  -0.933516   0.147834  -0.220464  -0.673484
          |     0.0583     0.2860     0.1753     0.4412     0.4128     0.2503
          |
       11 |  -0.735847   1.079976   0.536170   2.586049   1.743757   0.748257
          |     0.2309     0.1401     0.2959     0.0049     0.0406     0.2272
Col Mean-|
Row Mean |       7          8          9          10
---------+--------------------------------------------
        8 |   0.834645
          |     0.2020
          |
        9 |   1.008073   0.355517
          |     0.1567     0.3611
          |
       10 |   0.839834   0.069777  -0.282811
          |     0.2005     0.4722     0.3887
          |
       11 |   2.782937   1.396782   0.585780   1.162216
          |     0.0027     0.0812     0.2790     0.1226

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq7, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  40655.00 |
  |       2 | 124 |  63730.00 |
  |       3 | 220 | 112270.00 |
  |       4 | 194 | 105789.00 |
  |       5 | 138 |  76798.00 |
  |---------+-----+-----------|
  |       6 |  81 |  41235.00 |
  |       7 |  45 |  24842.00 |
  |       8 |  29 |  18999.00 |
  |       9 |  13 |   8325.00 |
  |      10 |  22 |  13773.00 |
  |---------+-----+-----------|
  |      11 | 116 |  63362.00 |
  +---------------------------+

chi-squared =    14.459 with 10 d.f.
probability =     0.1531

chi-squared with ties =    17.779 with 10 d.f.
probability =     0.0588
```

```
               Dunn's Pairwise Comparison of iq7 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |             1             2             3             4             5             6
---------+------------------------------------------------------------------------------------
       2 |  -0.911185
         |     0.1811
         |
       3 |  -0.902310   0.116431
         |     0.1834     0.4537
         |
       4 |  -1.853772  -0.981248  -1.278245
         |     0.0319     0.1632     0.1006
         |
       5 |  -2.041196  -1.237557  -1.530584  -0.362009
         |     0.0206     0.1079     0.0629     0.3587
         |
       6 |  -0.713304   0.122853   0.034446   0.985495   1.219413
         |     0.2378     0.4511     0.4863     0.1622     0.1113
         |
       7 |  -1.439516  -0.787636  -0.917725  -0.146588   0.093548  -0.831651
         |     0.0750     0.2155     0.1794     0.4417     0.4627     0.2028
         |
       8 |  -2.959064  -2.463005  -2.637831  -1.985144  -1.737404  -2.428826
         |     0.0015     0.0069     0.0042     0.0236     0.0412     0.0076
         |
       9 |  -1.958548  -1.560599  -1.639754  -1.194228  -1.040342  -1.581461
         |     0.0251     0.0593     0.0505     0.1162     0.1491     0.0569
         |
      10 |  -2.222639  -1.743556  -1.862341  -1.291486  -1.089991  -1.750747
         |     0.0131     0.0406     0.0313     0.0983     0.1379     0.0400
         |
      11 |  -1.712027  -0.899033  -1.126019  -0.028207   0.293755  -0.923223
         |     0.0434     0.1843     0.1301     0.4887     0.3845     0.1779
Col Mean-|
Row Mean |             7             8             9            10
---------+--------------------------------------------
       8 |  -1.557863
         |     0.0596
         |
       9 |  -1.009557   0.159054
         |     0.1564     0.4368
         |
      10 |  -1.023591   0.370267   0.147496
         |     0.1530     0.3556     0.4414
         |
      11 |   0.119255   1.887710   1.158465   1.235174
         |     0.4525     0.0295     0.1233     0.1084

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq8, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  44398.00 |
  |       2 | 124 |  67446.50 |
  |       3 | 220 | 114674.50 |
  |       4 | 194 | 109552.50 |
  |       5 | 138 |  77545.00 |
  |---------+-----+-----------|
  |       6 |  81 |  39286.00 |
  |       7 |  45 |  27072.00 |
  |       8 |  29 |  11459.50 |
  |       9 |  13 |   7777.00 |
  |      10 |  22 |  11179.00 |
  |---------+-----+-----------|
  |      11 | 116 |  59388.00 |
  +---------------------------+

chi-squared =    15.098 with 10 d.f.
```

```
probability =     0.1285

chi-squared with ties =    16.728 with 10 d.f.
probability =     0.0806


               Dunn's Pairwise Comparison of iq8 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |             1             2             3             4             5             6
---------+------------------------------------------------------------------------------------
       2 |  -0.523795
         |     0.3002
         |
       3 |   0.028930   0.689738
         |     0.4885     0.2452
         |
       4 |  -1.112733  -0.617347  -1.507100
         |     0.1329     0.2685     0.0659
         |
       5 |  -0.980783  -0.496797  -1.279359   0.085372
         |     0.1633     0.3097     0.1004     0.4660
         |
       6 |   0.820893   1.408492   0.952324   2.057639   1.876777
         |     0.2059     0.0795     0.1705     0.0198     0.0303
         |
       7 |  -1.468715  -1.132022  -1.677545  -0.761682  -0.789533  -2.141891
         |     0.0710     0.1288     0.0467     0.2231     0.2149     0.0161
         |
       8 |   2.019931   2.463517   2.180125   2.908858   2.788476   1.418337
         |     0.0217     0.0069     0.0146     0.0018     0.0026     0.0780
         |
       9 |  -0.870561  -0.636301  -0.921258  -0.399729  -0.427500  -1.294341
         |     0.1920     0.2623     0.1785     0.3447     0.3345     0.0978
         |
      10 |   0.202668   0.528388   0.200283   0.858878   0.800248  -0.328534
         |     0.4197     0.2986     0.4206     0.1952     0.2118     0.3713
         |
      11 |   0.247939   0.845071   0.276314   1.534811   1.354597  -0.635813
         |     0.4021     0.1990     0.3912     0.0624     0.0878     0.2624
Col Mean-|
Row Mean |             7             8             9            10
---------+--------------------------------------------
       8 |   2.961248
         |     0.0015
         |
       9 |   0.036549  -2.078189
         |     0.4854     0.0188
         |
      10 |   1.227169  -1.364937   0.879687
         |     0.1099     0.0861     0.1895
         |
      11 |   1.743327  -1.921793   1.007449  -0.056245
         |     0.0406     0.0273     0.1569     0.4776

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq9, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  42614.00 |
  |       2 | 124 |  71402.00 |
  |       3 | 220 | 115021.00 |
  |       4 | 194 | 107204.00 |
  |       5 | 138 |  73164.00 |
  |---------+-----+-----------|
  |       6 |  81 |  36234.00 |
  |       7 |  45 |  25791.00 |
  |       8 |  29 |  18002.00 |
  |       9 |  13 |   6129.00 |
```

```
  |      10 |  22 |  12144.00 |
  |---------+-----+-----------|
  |      11 | 116 |  62073.00 |
  +---------------------------+

chi-squared =    14.299 with 10 d.f.
probability =     0.1598

chi-squared with ties =    16.568 with 10 d.f.
probability =     0.0845


               Dunn's Pairwise Comparison of iq9 by iincome
                             (No adjustment)
Col Mean-|
Row Mean |             1             2             3             4             5             6
---------+------------------------------------------------------------------------------------
       2 |  -1.847551
         |     0.0323
         |
       3 |  -0.587541   1.648615
         |     0.2784     0.0496
         |
       4 |  -1.376451   0.705584  -1.056011
         |     0.0843     0.2402     0.1455
         |
       5 |  -0.730439   1.288633  -0.236466   0.703374
         |     0.2326     0.0988     0.4065     0.2409
         |
       6 |   1.214944   3.141555   2.028888   2.779463   2.067305
         |     0.1122     0.0008     0.0212     0.0027     0.0194
         |
       7 |  -1.360262   0.053977  -1.074127  -0.433524  -0.874138  -2.363446
         |     0.0869     0.4785     0.1414     0.3323     0.1910     0.0091
         |
       8 |  -1.939659  -0.760958  -1.731626  -1.195867  -1.548947  -2.799362
         |     0.0262     0.2233     0.0417     0.1159     0.0607     0.0026
         |
       9 |   0.350465   1.250438   0.628553   0.989247   0.706893  -0.282083
         |     0.3630     0.1056     0.2648     0.1613     0.2398     0.3889
         |
      10 |  -0.739751   0.359696  -0.455786   0.009284  -0.332100  -1.520705
         |     0.2297     0.3595     0.3243     0.4963     0.3699     0.0642
         |
      11 |  -0.826199   1.100886  -0.374111   0.520401  -0.136936  -2.117528
         |     0.2043     0.1355     0.3542     0.3014     0.4455     0.0171
Col Mean-|
Row Mean |             7             8             9            10
---------+--------------------------------------------
       8 |  -0.698600
         |     0.2424
         |
       9 |   1.127888   1.562424
         |     0.1297     0.0591
         |
      10 |   0.283759   0.849481  -0.804181
         |     0.3883     0.1978     0.2106
         |
      11 |   0.756224   1.440971  -0.760168   0.253676
         |     0.2248     0.0748     0.2236     0.3999

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq10, by(iincome)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iincome | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  85 |  40198.50 |
  |       2 | 124 |  64675.00 |
  |       3 | 220 | 115226.00 |
  |       4 | 194 | 105304.00 |
```

```
  |       5 | 138 |  75828.00 |
  |---------+-----+-----------|
  |       6 |  81 |  43222.00 |
  |       7 |  45 |  27158.00 |
  |       8 |  29 |  17443.00 |
  |       9 |  13 |   7630.50 |
  |      10 |  22 |  12461.00 |
  |---------+-----+-----------|
  |      11 | 116 |  60632.00 |
  +---------------------------+

chi-squared =     8.754 with 10 d.f.
probability =     0.5556

chi-squared with ties =    15.902 with 10 d.f.
probability =     0.1025


               Dunn's Pairwise Comparison of iq10 by iincome
                              (No adjustment)
Col Mean-|
Row Mean |             1             2             3             4             5             6
---------+------------------------------------------------------------------------------------
       2 |  -1.510986
         |     0.0654
         |
       3 |  -1.740758  -0.084983
         |     0.0409     0.4661
         |
       4 |  -2.349653  -0.807641  -0.845934
         |     0.0094     0.2096     0.1988
         |
       5 |  -2.428329  -0.986350  -1.036053  -0.262123
         |     0.0076     0.1620     0.1501     0.3966
         |
       6 |  -1.709198  -0.368355  -0.331484   0.304134   0.495983
         |     0.0437     0.3563     0.3701     0.3805     0.3100
         |
       7 |  -3.098024  -2.059211  -2.132063  -1.604670  -1.376629  -1.644439
         |     0.0010     0.0197     0.0165     0.0543     0.0843     0.0500
         |
       8 |  -2.614557  -1.694358  -1.720791  -1.289040  -1.113423  -1.371867
         |     0.0045     0.0451     0.0426     0.0987     0.1328     0.0851
         |
       9 |  -1.674775  -0.980992  -0.968521  -0.674109  -0.565066  -0.781047
         |     0.0470     0.1633     0.1664     0.2501     0.2860     0.2174
         |
      10 |  -1.709276  -0.847650  -0.834294  -0.458910  -0.322558  -0.596764
         |     0.0437     0.1983     0.2021     0.3231     0.3735     0.2753
         |
      11 |  -1.524450  -0.037823   0.040590   0.749543   0.930124   0.329695
         |     0.0637     0.4849     0.4838     0.2268     0.1762     0.3708
Col Mean-|
Row Mean |             7             8             9            10
---------+--------------------------------------------
       8 |   0.037254
         |     0.4851
         |
       9 |   0.229874   0.190278
         |     0.4091     0.4245
         |
      10 |   0.623759   0.542557   0.256952
         |     0.2664     0.2937     0.3986
         |
      11 |   2.012741   1.659858   0.961094   0.822269
         |     0.0221     0.0485     0.1683     0.2055

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2
```

- Question: For each of the questions, are there differences in the average response among regions?

```
. dunntest iq1, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit
```

```
Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  25801.50 |
  |       2 | 123 |  67314.50 |
  |       3 | 190 | 102363.00 |
  |       4 |  60 |  30521.00 |
  |       5 | 196 |  99988.50 |
  |---------+-----+-----------|
  |       6 |  74 |  39154.50 |
  |       7 | 102 |  53159.00 |
  |       8 |  77 |  40078.50 |
  |       9 | 189 | 101830.50 |
  +---------------------------+

chi-squared =     2.163 with 8 d.f.
probability =     0.9756

chi-squared with ties =     3.726 with 8 d.f.
probability =     0.8809


               Dunn's Pairwise Comparison of iq1 by iregion
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3         4          5          6
---------+------------------------------------------------------------------
       2 |   0.042474
         |     0.4831
         |
       3 |   0.269342   0.316211
         |     0.3938     0.3759
         |
       4 |   0.888316   1.052593   0.872168
         |     0.1872     0.1463     0.1916
         |
       5 |   1.026723   1.386337   1.206927  -0.042564
         |     0.1523     0.0828     0.1137     0.4830
         |
       6 |   0.457191   0.530134   0.302107  -0.505166  -0.597188
         |     0.3238     0.2980     0.3813     0.3067     0.2752
         |
       7 |   0.677356   0.837319   0.615384  -0.329566  -0.387744   0.223575
         |     0.2491     0.2012     0.2692     0.3709     0.3491     0.4115
         |
       8 |   0.660596   0.791341   0.580345  -0.294747  -0.330689   0.227308
         |     0.2544     0.2144     0.2808     0.3841     0.3704     0.4101
         |
       9 |   0.268329   0.314656  -0.001383  -0.872573  -1.206703  -0.302920
         |     0.3942     0.3765     0.4994     0.1914     0.1138     0.3810
Col Mean-|
Row Mean |        7          8
---------+----------------------
       8 |   0.018968
         |     0.4924
         |
       9 |  -0.615972  -0.580954
         |     0.2690     0.2806

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq2, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  23519.00 |
  |       2 | 123 |  69050.00 |
```

```
  |       3 | 190 | 100366.50 |
  |       4 |  60 |  31012.00 |
  |       5 | 196 | 100609.50 |
  |---------+-----+-----------|
  |       6 |  74 |  36875.00 |
  |       7 | 102 |  54881.50 |
  |       8 |  77 |  44283.00 |
  |       9 | 189 |  99614.50 |
  +---------------------------+

chi-squared =     4.999 with 8 d.f.
probability =     0.7577

chi-squared with ties =     7.247 with 8 d.f.
probability =     0.5102


               Dunn's Pairwise Comparison of iq2 by iregion
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -1.401196
         |     0.0806
         |
       3 |  -0.673408   1.128301
         |     0.2503     0.1296
         |
       4 |  -0.333024   1.113944   0.302762
         |     0.3696     0.1327     0.3810
         |
       5 |  -0.313209   1.646623   0.577895   0.094889
         |     0.3771     0.0498     0.2817     0.4622
         |
       6 |   0.044227   1.689339   0.860804   0.420891   0.433300
         |     0.4824     0.0456     0.1947     0.3369     0.3324
         |
       7 |  -0.841525   0.686424  -0.314897  -0.513148  -0.798495  -1.025584
         |     0.2000     0.2462     0.3764     0.3039     0.2123     0.1525
         |
       8 |  -1.590200  -0.372086  -1.366818  -1.332635  -1.810343  -1.858851
         |     0.0559     0.3549     0.0858     0.0913     0.0351     0.0315
         |
       9 |  -0.644434   1.167399   0.045410  -0.271087  -0.531360  -0.826147
         |     0.2596     0.1215     0.4819     0.3932     0.2976     0.2044
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |  -0.967067
         |     0.1668
         |
       9 |   0.352577   1.400283
         |     0.3622     0.0807

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq3, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  24663.50 |
  |       2 | 123 |  68571.50 |
  |       3 | 190 | 103626.00 |
  |       4 |  60 |  29282.00 |
  |       5 | 196 | 101056.00 |
  |---------+-----+-----------|
  |       6 |  74 |  36988.00 |
  |       7 | 102 |  51807.00 |
  |       8 |  77 |  42563.50 |
  |       9 | 189 | 101653.50 |
  +---------------------------+
```

```
chi-squared =     4.863 with 8 d.f.
probability =     0.7721

chi-squared with ties =     9.241 with 8 d.f.
probability =     0.3224


               Dunn's Pairwise Comparison of iq3 by iregion
                             (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -0.861221
         |     0.1946
         |
       3 |  -0.571695   0.471363
         |     0.2838     0.3187
         |
       4 |   0.850479   1.989908   1.747619
         |     0.1975     0.0233     0.0403
         |
       5 |   0.254530   1.643252   1.320843  -0.842644
         |     0.3995     0.0502     0.0933     0.1997
         |
       6 |   0.602672   1.767949   1.500029  -0.306543   0.520904
         |     0.2734     0.0385     0.0668     0.3796     0.3012
         |
       7 |   0.431017   1.670219   1.377797  -0.551195   0.283785  -0.238533
         |     0.3332     0.0474     0.0841     0.2908     0.3883     0.4057
         |
       8 |  -0.682835   0.146504  -0.246206  -1.696032  -1.247144  -1.466964
         |     0.2474     0.4418     0.4028     0.0449     0.1062     0.0712
         |
       9 |  -0.362407   0.764912   0.331578  -1.516629  -0.984934  -1.250510
         |     0.3585     0.2222     0.3701     0.0647     0.1623     0.1056
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |  -1.340578
         |     0.0900
         |
       9 |  -1.099269   0.497979
         |     0.1358     0.3092

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq4, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs | Rank Sum |
  |---------+-----+----------|
  |       1 |  47 | 23898.00 |
  |       2 | 123 | 70371.00 |
  |       3 | 190 | 99803.00 |
  |       4 |  60 | 29574.00 |
  |       5 | 196 | 99327.50 |
  |---------+-----+----------|
  |       6 |  74 | 39668.00 |
  |       7 | 102 | 56000.00 |
  |       8 |  77 | 43087.50 |
  |       9 | 189 | 98482.00 |
  +---------------------------+

chi-squared =     5.937 with 8 d.f.
probability =     0.6543

chi-squared with ties =     7.884 with 8 d.f.
probability =     0.4449


               Dunn's Pairwise Comparison of iq4 by iregion
```

```
                            (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -1.399868
         |     0.0808
         |
       3 |  -0.389159   1.526466
         |     0.3486     0.0634
         |
       4 |   0.301407   1.897289   0.824575
         |     0.3816     0.0289     0.2048
         |
       5 |   0.039361   2.142444   0.685502  -0.354599
         |     0.4843     0.0161     0.2465     0.3614
         |
       6 |  -0.557758   0.924573  -0.296550  -0.936798  -0.809347
         |     0.2885     0.1776     0.3834     0.1744     0.2092
         |
       7 |  -0.867458   0.650583  -0.729396  -1.300823  -1.304961  -0.320211
         |     0.1928     0.2577     0.2329     0.0967     0.0960     0.3744
         |
       8 |  -1.041294   0.325541  -0.957487  -1.460253  -1.480649  -0.544963
         |     0.1489     0.3724     0.1692     0.0721     0.0694     0.2929
         |
       9 |  -0.291544   1.661935   0.154551  -0.716903  -0.528838   0.412115
         |     0.3853     0.0483     0.4386     0.2367     0.2985     0.3401
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |  -0.263754
         |     0.3960
         |
       9 |   0.857955   1.074198
         |     0.1955     0.1414

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq5, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs | Rank Sum |
  |---------+-----+----------|
  |       1 |  47 | 25000.00 |
  |       2 | 123 | 70157.00 |
  |       3 | 190 | 97806.00 |
  |       4 |  60 | 31315.00 |
  |       5 | 196 | 99921.50 |
  |---------+-----+----------|
  |       6 |  74 | 41475.00 |
  |       7 | 102 | 54597.00 |
  |       8 |  77 | 40836.00 |
  |       9 | 189 | 99103.50 |
  +---------------------------+

chi-squared =     4.348 with 8 d.f.
probability =     0.8244

chi-squared with ties =     6.456 with 8 d.f.
probability =     0.5962


               Dunn's Pairwise Comparison of iq5 by iregion
                            (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------
       2 |  -0.894537
         |     0.1855
         |
       3 |   0.419717   1.916327
         |     0.3373     0.0277
```

```
          |
        4 |   0.204685   1.227342  -0.192492
          |     0.4189     0.1098     0.4237
          |
        5 |   0.542899   2.100075   0.194468   0.327393
          |     0.2936     0.0179     0.4229     0.3717
          |
        6 |  -0.610565   0.268597  -1.330089  -0.885045  -1.480943
          |     0.2707     0.3941     0.0917     0.1881     0.0693
          |
        7 |  -0.075772   1.045718  -0.665873  -0.327165  -0.831627   0.658314
          |     0.4698     0.1478     0.2527     0.3718     0.2028     0.2552
          |
        8 |   0.033979   1.098894  -0.459584  -0.195009  -0.608833   0.738209
          |     0.4864     0.1359     0.3229     0.4227     0.2713     0.2302
          |
        9 |   0.184904   1.584274  -0.372203  -0.065677  -0.569284   1.050261
          |     0.4267     0.0566     0.3549     0.4738     0.2846     0.1468
Col Mean-|
Row Mean |       7          8
---------+----------------------
        8 |   0.130148
          |     0.4482
          |
        9 |   0.354032   0.176403
          |     0.3617     0.4300

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq6, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +----------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  24290.50 |
  |       2 | 123 |  67846.50 |
  |       3 | 190 | 101167.00 |
  |       4 |  60 |  31261.00 |
  |       5 | 196 | 103413.00 |
  |---------+-----+-----------|
  |       6 |  74 |  36430.00 |
  |       7 | 102 |  52408.00 |
  |       8 |  77 |  40753.50 |
  |       9 | 189 | 102641.50 |
  +----------------------------+

chi-squared =     2.535 with 8 d.f.
probability =     0.9601

chi-squared with ties =     3.778 with 8 d.f.
probability =     0.8766


                Dunn's Pairwise Comparison of iq6 by iregion
                              (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------------
        2 |  -0.810245
          |     0.2089
          |
        3 |  -0.383515   0.660725
          |     0.3507     0.2544
          |
        4 |  -0.086090   0.775858   0.308663
          |     0.4657     0.2189     0.3788
          |
        5 |  -0.265616   0.832852   0.189948  -0.178732
          |     0.3953     0.2025     0.4247     0.4291
          |
        6 |   0.525236   1.610354   1.170901   0.660455   1.034219
          |     0.2997     0.0537     0.1208     0.2545     0.1505
```

```
         |
       7 |   0.068329   1.127482   0.607136   0.177112   0.452013  -0.562680
         |     0.4728     0.1298     0.2719     0.4297     0.3256     0.2868
         |
       8 |  -0.268646   0.613941   0.094387  -0.191391  -0.048979  -0.907275
         |     0.3941     0.2696     0.4624     0.4241     0.4805     0.1821
         |
       9 |  -0.643588   0.293845  -0.412947  -0.594761  -0.605829  -1.479401
         |     0.2599     0.3844     0.3398     0.2760     0.2723     0.0695
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |  -0.409188
         |     0.3412
         |
       9 |  -0.951871  -0.408107
         |     0.1706     0.3416

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq7, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +----------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  25775.50 |
  |       2 | 123 |  69441.50 |
  |       3 | 190 |  96261.50 |
  |       4 |  60 |  29885.00 |
  |       5 | 196 | 104560.50 |
  |---------+-----+-----------|
  |       6 |  74 |  36689.50 |
  |       7 | 102 |  55909.00 |
  |       8 |  77 |  41935.00 |
  |       9 | 189 |  99753.50 |
  +----------------------------+

chi-squared =     5.004 with 8 d.f.
probability =     0.7572

chi-squared with ties =     6.168 with 8 d.f.
probability =     0.6284


                Dunn's Pairwise Comparison of iq7 by iregion
                              (No adjustment)
Col Mean-|
Row Mean |        1          2          3          4          5          6
---------+------------------------------------------------------------------------
       2 |  -0.342213
         |     0.3661
         |
       3 |   0.931783   1.818737
         |     0.1757     0.0345
         |
       4 |   0.938892   1.534078   0.209944
         |     0.1739     0.0625     0.4169
         |
       5 |   0.334313   0.982182  -0.957666  -0.871545
         |     0.3691     0.1630     0.1691     0.1917
         |
       6 |   1.024920   1.698322   0.287329   0.047674   1.003173
         |     0.1527     0.0447     0.3869     0.4810     0.1579
         |
       7 |   0.005924   0.446007  -1.228147  -1.117670  -0.436178  -1.245082
         |     0.4976     0.3278     0.1097     0.1319     0.3314     0.1066
         |
       8 |   0.074683   0.498964  -1.021316  -0.981768  -0.300926  -1.089410
         |     0.4702     0.3089     0.1536     0.1631     0.3817     0.1380
         |
       9 |   0.459648   1.153261  -0.748309  -0.728610   0.202295  -0.847727
         |     0.3229     0.1244     0.2271     0.2331     0.4198     0.1983
```

```
Col Mean-|
Row Mean |        7         8
---------+----------------------
       8 |   0.084653
         |     0.4663
         |
       9 |   0.601297   0.451909
         |     0.2738     0.3257

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq8, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  24173.50 |
  |       2 | 123 |  63543.50 |
  |       3 | 190 |  99851.00 |
  |       4 |  60 |  30860.50 |
  |       5 | 196 | 106283.50 |
  |---------+-----+-----------|
  |       6 |  74 |  37277.50 |
  |       7 | 102 |  58555.00 |
  |       8 |  77 |  38886.50 |
  |       9 | 189 | 100780.00 |
  +---------------------------+

chi-squared =     4.074 with 8 d.f.
probability =     0.8504

chi-squared with ties =     4.516 with 8 d.f.
probability =     0.8078


                Dunn's Pairwise Comparison of iq8 by iregion
                              (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------------
       2 |  -0.045892
         |     0.4817
         |
       3 |  -0.236920  -0.265506
         |     0.4064     0.3953
         |
       4 |  -0.000210   0.049717   0.260358
         |     0.4999     0.4802     0.3973
         |
       5 |  -0.592588  -0.768275  -0.566239  -0.652046
         |     0.2767     0.2212     0.2856     0.2572
         |
       6 |   0.195439   0.301278   0.547699   0.210071   0.972587
         |     0.4225     0.3816     0.2919     0.4168     0.1654
         |
       7 |  -1.167548  -1.478256  -1.362451  -1.264884  -0.897613  -1.586690
         |     0.1215     0.0697     0.0865     0.1030     0.1847     0.0563
         |
       8 |   0.173304   0.274910   0.523165   0.186526   0.954118  -0.026870
         |     0.4312     0.3917     0.3004     0.4260     0.1700     0.4893
         |
       9 |  -0.399480  -0.494122  -0.258114  -0.439142   0.305373  -0.740665
         |     0.3448     0.3106     0.3982     0.3303     0.3800     0.2294
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |   1.575938
         |     0.0575
         |
       9 |   1.145365  -0.718903
         |     0.1260     0.2361
```

```
alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq9, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  20677.00 |
  |       2 | 123 |  72186.50 |
  |       3 | 190 | 102587.00 |
  |       4 |  60 |  28965.00 |
  |       5 | 196 |  99733.50 |
  |---------+-----+-----------|
  |       6 |  74 |  42108.50 |
  |       7 | 102 |  55248.00 |
  |       8 |  77 |  42429.00 |
  |       9 | 189 |  96276.50 |
  +---------------------------+

chi-squared =    13.497 with 8 d.f.
probability =     0.0958

chi-squared with ties =    15.670 with 8 d.f.
probability =     0.0473


                Dunn's Pairwise Comparison of iq9 by iregion
                              (No adjustment)
Col Mean-|
Row Mean |       1          2          3          4          5          6
---------+------------------------------------------------------------------------
       2 |  -3.021716
         |     0.0013
         |
       3 |  -2.164465   1.430595
         |     0.0152     0.0763
         |
       4 |  -0.775061   2.331881   1.361625
         |     0.2192     0.0099     0.0867
         |
       5 |  -1.496111   2.392263   1.076742  -0.623663
         |     0.0673     0.0084     0.1408     0.2664
         |
       6 |  -2.440672   0.427811  -0.748920  -1.751408  -1.555611
         |     0.0073     0.3344     0.2270     0.0399     0.0599
         |
       7 |  -2.034428   1.191120  -0.049282  -1.276529  -0.947432   0.632439
         |     0.0210     0.1168     0.4803     0.1009     0.1717     0.2635
         |
       8 |  -2.116297   0.870093  -0.289594  -1.398130  -1.105946   0.390079
         |     0.0172     0.1921     0.3861     0.0810     0.1344     0.3482
         |
       9 |  -1.502790   2.358466   1.048006  -0.634183  -0.019200   1.533501
         |     0.0664     0.0092     0.1473     0.2630     0.4923     0.0626
Col Mean-|
Row Mean |       7          8
---------+----------------------
       8 |  -0.219074
         |     0.4133
         |
       9 |   0.925552   1.085736
         |     0.1773     0.1388

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2

.
. dunntest iq10, by(iregion)

Warning: by() values are unlabeled, option nolabel implicit
```

```
Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | iregion | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 |  47 |  24342.50 |
  |       2 | 123 |  68159.50 |
  |       3 | 190 | 103335.00 |
  |       4 |  60 |  29614.00 |
  |       5 | 196 | 100986.00 |
  |---------+-----+-----------|
  |       6 |  74 |  36223.00 |
  |       7 | 102 |  54254.00 |
  |       8 |  77 |  40915.50 |
  |       9 | 189 | 102381.50 |
  +---------------------------+

chi-squared =     4.123 with 8 d.f.
probability =     0.8458

chi-squared with ties =     7.555 with 8 d.f.
probability =     0.4781


               Dunn's Pairwise Comparison of iq10 by iregion
                             (No adjustment)
Col Mean-|
Row Mean |        1          2         3          4          5          6
---------+------------------------------------------------------------------------
       2 |  -0.935595
         |     0.1747
         |
       3 |  -0.705458   0.393271
         |     0.2403     0.3471
         |
       4 |   0.553976   1.704126   1.504759
         |     0.2898     0.0442     0.0662
         |
       5 |   0.073394   1.498376   1.245921  -0.650586
         |     0.4707     0.0670     0.1064     0.2577
         |
       6 |   0.675122   1.946495   1.757676   0.103700   0.835569
         |     0.2498     0.0258     0.0394     0.4587     0.2017
         |
       7 |  -0.351199   0.735705   0.431870  -1.043803  -0.604764  -1.230118
         |     0.3627     0.2310     0.3329     0.1483     0.2727     0.1093
         |
       8 |  -0.321760   0.694206   0.409844  -0.972509  -0.531464  -1.139406
         |     0.3738     0.2438     0.3410     0.1654     0.2975     0.1273
         |
       9 |  -0.646183   0.475741   0.093459  -1.439010  -1.150070  -1.686357
         |     0.2591     0.3171     0.4628     0.0751     0.1251     0.0459
Col Mean-|
Row Mean |        7          8
---------+---------------------
       8 |   0.015606
         |     0.4938
         |
       9 |  -0.353323  -0.338514
         |     0.3619     0.3675

alpha =   0.05
Reject Ho if p = P(Z <= |z|) <= alpha/2
```

- Question – For each of the questions, 1-10, are there differences in the average response among the devices used?

```
. dunntest iq1, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
```

```
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 235385.00 |
  |       2 | 464 | 243130.00 |
  |       4 | 117 |  72496.00 |
  |       5 |  22 |  13796.00 |
  |       6 |   9 |   4971.00 |
  +---------------------------+

chi-squared =    12.894 with 4 d.f.
probability =     0.0118

chi-squared with ties =    22.109 with 4 d.f.
probability =     0.0002


               Dunn's Pairwise Comparison of iq1 by idevice
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1         2          4          5
---------+--------------------------------------------
       2 |  -0.428773
         |     0.4176
         |
       4 |  -4.193416  -3.928305
         |     0.0001     0.0002
         |
       5 |  -2.136598  -2.007905  -0.136539
         |     0.0544     0.0558     0.4457
         |
       6 |  -0.441873  -0.357900   0.826607   0.802829
         |     0.4704     0.4002     0.4085     0.3517

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq2, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 238731.50 |
  |       2 | 464 | 243803.00 |
  |       4 | 117 |  69497.50 |
  |       5 |  22 |  13042.00 |
  |       6 |   9 |   4704.00 |
  +---------------------------+

chi-squared =     6.023 with 4 d.f.
probability =     0.1975

chi-squared with ties =     8.683 with 4 d.f.
probability =     0.0695


               Dunn's Pairwise Comparison of iq2 by idevice
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1          2          4          5
---------+--------------------------------------------
       2 |  -0.044463
         |     0.6890
         |
       4 |  -2.605346  -2.582173
         |     0.0459     0.0245
         |
       5 |  -1.216133  -1.203232   0.019744
         |     0.3732     0.2861     0.4921
         |
       6 |   0.023358   0.032079   0.803447   0.690797
         |     0.5452     0.6090     0.4217     0.4081

False Discovery Rate =   0.05
```

```
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq3, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 231099.50 |
  |       2 | 464 | 249881.00 |
  |       4 | 117 |  70070.00 |
  |       5 |  22 |  13920.00 |
  |       6 |   9 |   4807.50 |
  +---------------------------+

chi-squared =    10.808 with 4 d.f.
probability =     0.0288

chi-squared with ties =    20.278 with 4 d.f.
probability =     0.0004


                Dunn's Pairwise Comparison of iq3 by idevice
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1          2          4          5
---------+--------------------------------------------
       2 |  -2.063320
         |     0.0489
         |
       4 |  -3.901314  -2.593174
         |     0.0005     0.0238
         |
       5 |  -2.541578  -1.918820  -0.647263
         |     0.0184     0.0550     0.3234
         |
       6 |  -0.346709   0.057717   0.831681   1.107209
         |     0.4049     0.4770     0.2897     0.2235

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq4, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 233917.50 |
  |       2 | 464 | 245190.00 |
  |       4 | 117 |  71356.50 |
  |       5 |  22 |  13558.00 |
  |       6 |   9 |   5756.00 |
  +---------------------------+

chi-squared =    11.767 with 4 d.f.
probability =     0.0192

chi-squared with ties =    15.571 with 4 d.f.
probability =     0.0037


                Dunn's Pairwise Comparison of iq4 by idevice
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1          2          4          5
---------+--------------------------------------------
       2 |  -0.810343
         |     0.2984
```

```
         |
       4 |  -3.449252  -2.939310
         |     0.0028     0.0082
         |
       5 |  -1.747119  -1.502874  -0.102617
         |     0.1344     0.1661     0.4591
         |
       6 |  -1.391205  -1.232608  -0.320191  -0.219652
         |     0.1642     0.1814     0.4680     0.4590

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq5, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 233689.00 |
  |       2 | 464 | 246682.00 |
  |       4 | 117 |  72399.00 |
  |       5 |  22 |  13029.00 |
  |       6 |   9 |   3979.00 |
  +---------------------------+

chi-squared =    12.465 with 4 d.f.
probability =     0.0142

chi-squared with ties =    18.400 with 4 d.f.
probability =     0.0010


                Dunn's Pairwise Comparison of iq5 by idevice
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |       1          2          4          5
---------+--------------------------------------------
       2 |  -1.078030
         |     0.2007
         |
       4 |  -4.001036  -3.321473
         |     0.0003     0.0022
         |
       5 |  -1.420055  -1.094722   0.450750
         |     0.1556     0.2280     0.3261
         |
       6 |   0.837348   1.048842   2.013779   1.495773
         |     0.2236     0.1839     0.0734     0.1684

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq6, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 232150.00 |
  |       2 | 464 | 249498.50 |
  |       4 | 117 |  70802.00 |
  |       5 |  22 |  12735.50 |
  |       6 |   9 |   4592.00 |
  +---------------------------+

chi-squared =     9.534 with 4 d.f.
probability =     0.0491
```

```
chi-squared with ties =    14.174 with 4 d.f.
probability =     0.0068


                Dunn's Pairwise Comparison of iq6 by idevice
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |       1          2          4          5
---------+--------------------------------------------
       2 |  -1.648801
         |     0.1653
         |
       4 |  -3.623520  -2.579191
         |     0.0015     0.0248
         |
       5 |  -1.244659  -0.746660   0.447117
         |     0.2666     0.3794     0.4092
         |
       6 |  -0.000029   0.323201   1.085795   0.686639
         |     0.5000     0.4147     0.2776     0.3516

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq7, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 241171.00 |
  |       2 | 464 | 241784.00 |
  |       4 | 117 |  70870.00 |
  |       5 |  22 |  12133.00 |
  |       6 |   9 |   3820.00 |
  +---------------------------+

chi-squared =     8.437 with 4 d.f.
probability =     0.0768

chi-squared with ties =    10.374 with 4 d.f.
probability =     0.0346


                Dunn's Pairwise Comparison of iq7 by idevice
                            (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1          2          4          5
---------+--------------------------------------------
       2 |   0.488676
         |     0.3473
         |
       4 |  -2.627194  -2.944079
         |     0.0215     0.0162
         |
       5 |  -0.353648  -0.501570   0.839686
         |     0.3618     0.3850     0.2865
         |
       6 |   1.128879   1.033292   1.885785   1.155457
         |     0.2589     0.2512     0.0989     0.3099

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq8, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
```

```
  |---------+-----+-----------|
  |       1 | 455 | 236191.50 |
  |       2 | 464 | 255170.50 |
  |       4 | 117 |  60562.50 |
  |       5 |  22 |  13139.50 |
  |       6 |   9 |   4714.00 |
  +---------------------------+

chi-squared =     3.571 with 4 d.f.
probability =     0.4671

chi-squared with ties =     3.957 with 4 d.f.
probability =     0.4119


               Dunn's Pairwise Comparison of iq8 by idevice
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |        1          2         4          5
---------+--------------------------------------------
       2 |  -1.596325
         |     0.5521
         |
       4 |   0.048571   1.066739
         |     0.5340     0.3576
         |
       5 |  -1.222802  -0.740661  -1.170335
         |     0.5535     0.4589     0.4031
         |
       6 |  -0.047444   0.265489  -0.060723   0.634244
         |     0.4811     0.5647     0.5947     0.4383

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule

.
. dunntest iq9, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 233402.00 |
  |       2 | 464 | 251754.00 |
  |       4 | 117 |  69053.00 |
  |       5 |  22 |  11048.00 |
  |       6 |   9 |   4521.00 |
  +---------------------------+

chi-squared =     6.698 with 4 d.f.
probability =     0.1527

chi-squared with ties =     7.761 with 4 d.f.
probability =     0.1007


               Dunn's Pairwise Comparison of iq9 by idevice
                           (Benjamini-Hochberg)
Col Mean-|
Row Mean |       1          2          4          5
---------+--------------------------------------------
       2 |  -1.567210
         |     0.1951
         |
       4 |  -2.602321  -1.607996
         |     0.0463     0.2696
         |
       5 |   0.172649   0.646611   1.322982
         |     0.5393     0.4316     0.2323
         |
       6 |   0.110391   0.417646   0.887233  -0.001338
         |     0.5067     0.4830     0.3750     0.4995

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
```

```
.
. dunntest iq10, by(idevice) ma(bh) wrap

Warning: by() values are unlabeled, option nolabel implicit


Kruskal-Wallis equality-of-populations rank test

  +---------------------------+
  | idevice | Obs |  Rank Sum |
  |---------+-----+-----------|
  |       1 | 455 | 230212.00 |
  |       2 | 464 | 251454.50 |
  |       4 | 117 |  70292.50 |
  |       5 |  22 |  13460.00 |
  |       6 |   9 |   4359.00 |
  +---------------------------+

chi-squared =    11.207 with 4 d.f.
probability =     0.0243

chi-squared with ties =    20.357 with 4 d.f.
probability =     0.0004


               Dunn's Pairwise Comparison of iq10 by idevice
                             (Benjamini-Hochberg)
Col Mean-|
Row Mean |       1          2          4          5
---------+--------------------------------------------
       2 |  -2.384264
         |     0.0285
         |
       4 |  -4.001160  -2.488534
         |     0.0003     0.0321
         |
       5 |  -2.120896  -1.400904  -0.207547
         |     0.0424     0.1152     0.4178
         |
       6 |   0.280999   0.748461   1.472429   1.409124
         |     0.4326     0.2839     0.1409     0.1323

False Discovery Rate =   0.05
Reject Ho if p = P(Z <= |z|) <= FDR/2 with stopping rule
```