Significance Tests for comparing means with Minitab

Matched (paired) t-test

Is there a difference in energy consumption with vent damper in vs out?

```
MTB > let c11 = c9-c10
MTB > name c11 'DiffBTU'
MTB > descr c8 c9 c11

                N     MEAN   MEDIAN   TRMEAN    STDEV   SEMEAN
BTU.IN         90   10.038    9.835    9.978    2.868    0.302
BTU.OUT        90   10.813   10.740   10.738    3.088    0.326
DiffBTU        90    9.258    9.125    9.175    3.093    0.326

               MIN      MAX       Q1       Q3
BTU.IN       2.970   18.260    7.915   12.167
BTU.OUT      3.200   20.550    8.605   12.873
DiffBTU      1.200   19.550    7.273   11.063

MTB > ttest c11

TEST OF MU = 0.000 VS MU N.E. 0.000

             N      MEAN    STDEV   SE MEAN        T    P VALUE
DiffBTU     90     9.258    3.093     0.326    28.39     0.0000
```

Twosample t-test

Does the difference in consumption with vent damper in vs out depend on type of vent damper?

```
MTB > twot c11 group memberships in c10;
SUBC> pooled.

TWOSAMPLE T FOR DiffBTU
DAMPER   N      MEAN     STDEV   SE MEAN
1       40      9.57      3.24      0.51
2       50      9.01      2.98      0.42

95 PCT CI FOR MU 1 - MU 2: (-0.75, 1.87)

TTEST MU 1 = MU 2 (VS NE): T= 0.85  P=0.40  DF=  88

POOLED STDEV =       3.10
```

One-factor ANOVA

Does the number of rotten potatos depend on oxygen level?

```
MTB > oneway ANOVA on the data in c4, group membership in c3;
SUBC> tukey multiple comparisons please.

ANALYSIS OF VARIANCE ON ROT
SOURCE     DF        SS        MS        F        p
OXYGEN      2      97.8      48.9     0.96    0.391
ERROR      51    2609.2      51.2
TOTAL      53    2707.0
                                    INDIVIDUAL 95 PCT CI'S FOR MEAN
                                    BASED ON POOLED STDEV
 LEVEL      N      MEAN     STDEV  -----+---------+---------+---------+-
     1     18    11.278     6.927             (-----------*----------)
     2     18     8.167     7.139   (----------*-----------)
     3     18     8.778     7.385     (----------*-----------)
                                    -----+---------+---------+---------+-
POOLED STDEV =    7.153               6.0       9.0      12.0      15.0

Tukey's pairwise comparisons

    Family error rate = 0.0500
Individual error rate = 0.0194

Critical value = 3.41

Intervals for (column level mean) - (row level mean)

               1         2

     2    -2.638
           8.860

     3    -3.249    -6.360
           8.249     5.138
```