WILCOXON SIGNED RANK TEST

OPTIONS NOCENTER FORMDLIM='-' ;
PROC IMPORT OUT= WORK.AAA
   DATAFILE= "D:\WORK\BIOS-6222\Spring-2008\Data\Table9-1.xls"
   DBMS=EXCEL REPLACE;
   SHEET="Sheet1$";
   GETNAMES=YES;
   MIXED=NO;
   SCANTEXT=YES;
   USEDATE=YES;
   SCANTIME=YES;
RUN;

PROC CONTENTS DATA=AAA ; RUN ; QUIT ;

PROC SORT DATA=AAA ; BY DAY1 ; RUN ;

DATA BBB ; *DIFFERENCES FOR SAS WILL KEEP THEIR SIGN;
   SET AAA ;
   IF 8 LE _N_ LE 26 THE DELETE ;
   RDAY1+1 ;
   IF RDAY1 LE 7 THEN DO ;
      DIFF=DAY2-DAY1 ;
      IF DAY1<DAY2 THEN SIGN='+' ;
      IF DAY1>DAY2 THEN SIGN='-' ;
   END ;
   IF RDAY1 GE 8 THEN DO ;
      DIFF=DAY1-DAY2 ;
      IF DAY1<DAY2 THEN SIGN='-' ;
      IF DAY1>DAY2 THEN SIGN='+' ;
   END ;
RUN ;
PROC PRINT DATA=BBB ; RUN ;
title 'WILCOXON SIGNED RANK TEST';
PROC UNIVARIATE;
   VAR DIFF;
RUN;

Tests for Location: Mu0=0

<table>
<thead>
<tr>
<th>Test</th>
<th>-Statistic-</th>
<th>-----p Value------</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student's t</td>
<td>2.293105</td>
<td>Pr &gt;</td>
</tr>
<tr>
<td>Sign</td>
<td>M 3</td>
<td>Pr &gt;=</td>
</tr>
<tr>
<td>Signed Rank</td>
<td>S 29.5</td>
<td>Pr &gt;=</td>
</tr>
</tbody>
</table>

NOTE: SAS uses the sum of the ranks of the positive values minus the sum expected under the null hypothesis, (n*(n+1)/4). In this example, S is 29.5 (= 82 - 52.5). The p-value is exact for n≤20.
WILCOXON RANK SUM TEST

OPTIONS NOCENTER FORMDLIM='-' ;
data aaa ;
infile 'your path\Table 9.5.txt' expandtabs firstobs=2 ;
input ID PROP_FAT GRADES $ ;
run ;
PROC PRINT DATA=AAA ; RUN ;

PROC NPAR1WAY DATA=aaa WILCOXON;
  CLASS GRADES ;
  VAR PROP_FAT ;
RUN; QUIT ;

The NPAR1WAY Procedure

Wilcoxon Scores (Rank Sums) for Variable PROP_FAT
Classified by Variable GRADES

<table>
<thead>
<tr>
<th>GRADES</th>
<th>N</th>
<th>Sum of Scores</th>
<th>Expected Under H0</th>
<th>Std Dev Under H0</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6</td>
<td>14</td>
<td>224.50</td>
<td>238.0</td>
<td>27.450696</td>
<td>16.035714</td>
</tr>
<tr>
<td>7-8</td>
<td>19</td>
<td>336.50</td>
<td>323.0</td>
<td>27.450696</td>
<td>17.710526</td>
</tr>
</tbody>
</table>

Average scores were used for ties.

Wilcoxon Two-Sample Test

Statistic 224.5000

Normal Approximation
Z -0.4736
One-Sided Pr < Z 0.3179
Two-Sided Pr > |Z| 0.6358

Z includes a continuity correction of 0.5.

Kruskal-Wallis Test

Chi-Square 0.2419
DF 1
Pr > Chi-Square 0.6229