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


Test           -Statistic-    -----p Value------

Student's t    t  2.293105    Pr > |t|    0.0392
Sign           M         3    Pr >= |M|   0.1796
Signed Rank    S      29.5    Pr >= |S|   0.0676     (Two-sided p-value,)
```

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 $n \leq 20$.

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

GRADES	N	Sum of Scores	Expected Under H0	Std Dev Under H0	Mean Score
5-6	14	224.50	238.0	27.450696	16.035714
7-8	19	336.50	323.0	27.450696	17.710526

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

t Approximation
One-Sided Pr < Z   0.3195
Two-Sided Pr > |Z| 0.6390

Z includes a continuity correction of 0.5.

Kruskal-Wallis Test

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