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ABSTRACT

Intended for classroom use only, these unpublished notes contain computer lessons on descriptive statistics with files previously created in WordPerfect 4.2 and Lotus 1-2-3 Version 1.A for the IBM PC+. The statistical measures covered include Student's t-test with two independent samples; Student's t-test with a paired sample; Chi-square analysis; Pearson's product moment coefficient of correlation; One-way analysis of variance, with Tukey mean comparison; Two-way analysis of variance; Using PLOT and HISTOGRAM to display data; Simple linear regression; and Using SELECT IF, COMPUTE, and IF to calculate descriptive statistics. (ALF)

Nova University

Center for Computer and Information Sciences

EXAMPLES OF DATA ANALYSIS

WITH SPSS/PC+ STUDENTWARE

THOMAS W. MACFARLAND, Ed.D.

FOR CLASSROOM USE ONLY

25th ANNIVERSARY
Setting the Pace in Education

EXAMPLES OF DATA ANALYSIS WITH SPSS/PC+ STUDENTWARE

Thomas W. MacFarland, Ed.D.

Unpublished notes of the author
December, 1989

```
*  Test:      Descriptive Statistics, with files previously
*             created in WordPerfect 4.2 and Lotus 1-2-3
*             Version 1.A
*
*  Author:    Thomas W. MacFarland, Ed.D.
*
*  Source:    Personal notes
*
*  Software:  SPSS/PC+ Studentware
*
*  Scenario:  Based on data provided in Table 1, determine the
*             mean for subject Tom.
```

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	085	094

```
*  Answer:    Answer(s) can be found in sample.lis.  Briefly,
*
*             Mean for Tom = 85.00
*
*             Be sure to rename spss.lis to sample.lis.

DATA LIST /
     Test_#       01
     Tom        03-05
     Bob        07-09
     Roy        11-13
     Sue        15-17
     Bea        19-21.

VARIABLE LABELS
     Test_#    "Test Number (of five)"
```

```
      Tom         "Thomas R. O'Callish"
      Bob         "Robert E. Lee, IV"
      Roy         "Leroy G. Anglesh"
      Sue         "Susan V. Douglas"
      Bea         "Beatrice H. Malcolm".

BEGIN DATA.
1 089 091 081 081 083
2 091 081 071 089 100
3 091 065 045 081 092
4 082 071 062 079 081
5 072 067 091 085 094
END DATA.
                              SPSS/PC+ Studentware                    11/27/89
include 'sample.dat'.
*  Test:       Descriptive Statistics, with files previously
*              created in WordPerfect 4.2 and Lotus 1-2-3
*              Version 1.A
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     Personal notes
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine the
*              mean for subject Tom.
*
*
*
*                                   Table 1
*
*                                Summary Data
*
*
*
*
*
*              Test #      Tom      Bob      Roy      Sue      Bea
*
*
*                1         089      091      081      081      083
*
*                2         091      081      071      089      100
*
*                3         091      065      045      081      092
*
*                4         082      071      062      079      081
*
*                5         072      067      091      085      094
*
*
*  Answer:     Answer(s) can be found in sample.lis.  Briefly,
```

```
*
*             Mean for Tom = 85.00
*
*             Be sure to rename spss.lis to sample.lis.

DATA LIST /
     Test_#        01
     Tom         03-05
     Bob         07-09
     Roy         11-13
     Sue         15-17
     Bea         19-21.

VARIABLE LABELS
     Test_#     "Test Number (of five)"
     Tom        "Thomas R. O'Callish"
     Bob        "Robert E. Lee, IV"
     Roy        "Leroy G. Anglesh"
     Sue        "Susan V. Douglas"
     Bea        "Beatrice H. Malcolm".

BEGIN DATA.
END DATA.
      5 cases are written to the compressed active file.

This procedure was completed at  1:30:09
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to     890 Value Labels for each Variable.
```

TOM   Thomas R. O'Callish

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	72	1	20.0	20.0	20.0
	82	1	20.0	20.0	40.0
	89	1	20.0	20.0	60.0
	91	2	40.0	40.0	100.0
	TOTAL	5	100.0	100.0	

Mean   85.000

Valid Cases   5   Missing Cases   0

This procedure was completed at 1:31:44

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```
finish
[Next command's output on page   1
include 'sample.dat'.
[*  Test:       Descriptive Statistics, with files previously
[*              created in WordPerfect 4.2 and Lotus 1-2-3
[*              Version 1.A
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
[*
[*  Source:     Personal notes
[*
[*  Software:   SPSS/PC+ Studentware
[*
[*  Scenario:   Based on data provided in Table 1, determine the
[*              mean for subject Tom.
[*
[*
[*
[*                                  Table 1
[*
[*                              Summary Data
[*
[*
[*
[*
[*
[*              Test #      Tom      Bob      Roy      Sue      Bea
[*
[*
[*                1         089      091      081      081      083
[*
[*                2         091      081      071      089      100
[*
[*                3         091      065      045      081      092
[*
[*                4         082      071      062      079      081
[*
[*                5         072      067      091      085      094
[*
[*
[*  Answer:     Answer(s) can be found in sample.lis.  Briefly,
[*
[*              Mean for Tom = 85.00
[*
[*              Be sure to rename spss.lis to sample.lis.
[
[DATA LIST /
[      Test_#        01
[      Tom         03-05
[      Bob         07-09
[      Roy         11-13
```

```
[      Sue         15-17
[      Bea         19-21.
[
[VARIABLE LABELS
[      Test_#      "Test Number (of five)"
[      Tom         "Thomas R. O'Callish"
[      Bob         "Robert E. Lee, IV"
[      Roy         "Leroy G. Anglesh"
[      Sue         "Susan V. Douglas"
[      Bea         "Beatrice H. Malcolm".
[
[BEGIN DATA.
[1 089 091 081 081 083
[2 091 081 071 089 100
[3 091 065 045 081 092
[4 082 071 062 079 081
[5 072 067 091 085 094
[END DATA.
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.
[Next command's output on page   3
finish
```

* Test: Descriptive Statistics
*
* Author: Thomas W. MacFarland, Ed.D.
*
* Source: McClave, James T., and Frank H. Dietrich, II.
* STATISTICS, 4th edition. San Francisco,
* California: Dellen Publishing Company, 1988.
* ISBN 0-02-379260-4 Page 48
*
* Software: SPSS/PC+ Studentware
*
* Scenario: Based on data provided in Table 1, determine the
* following for each sample:
*
* 1. Median
*
* 2. Mean
*
* 3. Standard Deviation

Table 1

Summary Data

Sample #1	Sample #2	Sample #3
0039	0100	0100
0042	0004	0004
0040	0007	0007
0037	0096	0030
0041	0080	0080
	0003	0030
	0001	0042
	0010	0002
	0002	

* Note: Use the MISSING VALUE command so that all samples
* can be retained in the same file.
*
* Answer: Answer(s) can be found in mean-sd.lis.
*
* Be sure to rename spss.lis to mean-sd.lis.

```
DATA LIST /
     Sample_1 01-04
     Sample_2 06-09
```

```
     Sample_3 11-14.

VARIABLE LABELS
     Sample_1 "Sample #1"
     Sample_2 "Sample #2"
     Sample_3 "Sample #3".

MISSING VALUE Sample_1 (0999) Sample_2 (0999) Sample_3 (0999).

BEGIN DATA.
0039 0100 0100
0042 0004 0004
0040 0007 0007
0037 0096 0030
0041 0080 0080
0999 0003 0030
0999 0001 0042
0999 0010 0002
0999 0002 0999
END DATA.
                              SPSS/PC+ Studentware                    11/26/89
include 'mean-sd.dat'.
*  Test:       Descriptive Statistics
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
*                   California:  Dellen Publishing Company, 1988.
*                   ISBN 0-02-379260-4  Page 48
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine the
*              following for each sample:
*
*              1.  Median
*
*              2.  Mean
*
*              3.  Standard Deviation
*
*
*                                  Table 1
*
*                              Summary Data
*
*              ____________________________________________________
*              ____________________________________________________
*
*              Sample #1          Sample #2          Sample #3
*              ____________________________________________________
```

```
*
*              0039          0100          0100
*              0042          0004          0004
*              0040          0007          0007
*              0037          0096          0030
*              0041          0080          0080
*                            0003          0030
*                            0001          0042
*                            0010          0002
*                            0002
*
*
*  Note:       Use the MISSING VALUE command so that all samples
*              can be retained in the same file.
*
*  Answer:     Answer(s) can be found in mean-sd.lis.
*
*              Be sure to rename spss.lis to mean-sd.lis.

DATA LIST /
     Sample_1 01-04
     Sample_2 06-09
     Sample_3 11-14.

VARIABLE LABELS
     Sample_1 "Sample #1"
     Sample_2 "Sample #2"
     Sample_3 "Sample #3".

MISSING VALUE Sample_1 (0999) Sample_2 (0999) Sample_3 (0999).

BEGIN DATA.
END DATA.
      9 cases are written to the compressed active file.

This procedure was completed at 14:17:57
FREQUENCIES VARIABLES = Sample_1 Sample_2 Sample_3 / STATISTICS ALL.

***** Memory allows a total of   4652 Values, accumulated across all Variables.
      There also may be up to     581 Value Labels for each Variable.
```

Page 2 SPSS/PC+ Studentware 11/26/89

SAMPLE_1 Sample #1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	37	1	11.1	20.0	20.0
	39	1	11.1	20.0	40.0
	40	1	11.1	20.0	60.0

41	1	11.1	20.0	80.0
42	1	11.1	20.0	100.0
999	4	44.4	MISSING	
TOTAL	9	100.0	100.0	

Mean	39.800	Std Err	.860	Median	40.000
Mode	37.000	Std Dev	1.924	Variance	3.700
Kurtosis	-.022	S E Kurt	2.000	Skewness	-.590
S E Skew	.913	Range	5.000	Minimum	37.000
Maximum	42.000	Sum	199.000		

Valid Cases 5 Missing Cases 4

SAMPLE_2 Sample #2

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	1	11.1	11.1	11.1
	2	1	11.1	11.1	22.2
	3	1	11.1	11.1	33.3
	4	1	11.1	11.1	44.4
	7	1	11.1	11.1	55.6
	10	1	11.1	11.1	66.7
	80	1	11.1	11.1	77.8
	96	1	11.1	11.1	88.9
	100	1	11.1	11.1	100.0
	TOTAL	9	100.0	100.0	

SAMPLE_2 Sample #2

Mean	33.667	Std Err	14.717	Median	7.000
Mode	1.000	Std Dev	44.150	Variance	1949.250
Kurtosis	-1.492	S E Kurt	1.400	Skewness	.896
S E Skew	.717	Range	99.000	Minimum	1.000
Maximum	100.000	Sum	303.000		

Valid Cases 9 Missing Cases 0

SAMPLE_3 Sample #3

		Valid	Cum

Value Label	Value	Frequency	Percent	Percent	Percent
	2	1	11.1	12.5	12.5
	4	1	11.1	12.5	25.0
	7	1	11.1	12.5	37.5
	30	2	22.2	25.0	62.5
	42	1	11.1	12.5	75.0
	80	1	11.1	12.5	87.5
	100	1	11.1	12.5	100.0
	999	1	11.1	MISSING	
	TOTAL	9	100.0	100.0	

Mean	36.875	Std Err	12.786	Median	30.000
Mode	30.000	Std Dev	36.164	Variance	1307.839
Kurtosis	-.333	S E Kurt	1.481	Skewness	.913
S E Skew	.752	Range	98.000	Minimum	2.000
Maximum	100.000	Sum	295.000		

Valid Cases 8 Missing Cases 1

This procedure was completed at 14:21:02

```
finish
Next command's output on page   1
include 'mean-sd.dat'.
* Test:      Descriptive Statistics
*
* Author:    Thomas W. MacFarland, Ed.D.
*
* Source:    McClave, James T., and Frank H. Dietrich, II.
*                STATISTICS, 4th edition.  San Francisco,
*                California:  Dellen Publishing Company, 1988.
*                ISBN 0-02-379260-4  Page 48
*
* Software:  SPSS/PC+ Studentware
*
* Scenario:  Based on data provided in Table 1, determine the
*            following for each sample:
*
*            1.  Median
*
*            2.  Mean
*
*            3.  Standard Deviation
*
*
*                                Table 1
*
*                            Summary Data
```

```
[*
[*
[*       ________________________________________________________________
[*       ________________________________________________________________
[*       Sample #1               Sample #2                 Sample #3
[*       ________________________________________________________________
[*
[*         0039                    0100                      0100
[*         0042                    0004                      0004
[*         0040                    0007                      0007
[*         0037                    0096                      0030
[*         0041                    0080                      0080
[*                                 0003                      0030
[*                                 0001                      0042
[*                                 0010                      0002
[*                                 0002
[*
[*       ________________________________________________________________
[*  Note:        Use the MISSING VALUE command so that all samples
[*               can be retained in the same file.
[*
[*  Answer:      Answer(s) can be found in mean-sd.lis.
[*
[*               Be sure to rename spss.lis to mean-sd.lis.
[
[DATA LIST /
[     Sample_1 01-04
[     Sample_2 06-09
[     Sample_3 11-14.
[
[VARIABLE LABELS
[     Sample_1 "Sample #1"
[     Sample_2 "Sample #2"
[     Sample_3 "Sample #3".
[
[MISSING VALUE Sample_1 (0999) Sample_2 (0999) Sample_3 (0999).
[
[BEGIN DATA.
[0039 0100 0100
[0042 0004 0004
[0040 0007 0007
[0037 0096 0030
[0041 0080 0080
[0999 0003 0030
[0999 0001 0042
[0999 0010 0002
[0999 0002 0999
[END DATA.
FREQUENCIES VARIABLES = Sample_1 Sample_2 Sample_3 / STATISTICS ALL.
[Next command's output on page   6
finish
```

```
*   Test:        Student's t-test with two independent samples
*
*   Author:      Thomas W. MacFarland, Ed.D.
*
*   Source:      Joseph, Marjory L., and William D. Joseph.
*                     RESEARCH FUNDAMENTALS IN HOME ECONOMICS.
*                     Redondo Beach, California:  Plycon Press,
*                     1979.  ISBN 0-8087-3415-6  Page 182
*
*   Software:    SPSS/PC+ Studentware
*
*   Scenario:    Based on data provided in Table 1, determine if
*                there are true differences (alpha = .05) between
*                Group #1 and Group #2.
*
*
*                                  Table 1
*
*                               Summary Data
*
*
*                ____________________________________________________
*                ____________________________________________________
*
*                    Group #1                      Group #2
*                ____________________________________________________
*
*                36    35    39    46         26    27    37    29
*                31    36    29    31         38    36    29    36
*                43    38    33    32         33    24    22    28
*                42    47    47    36         25    31    31    30
*                ____________________________________________________
*
*   Note:        In addition, calculate descriptive statistics for
*                each group.
*
*   Ho:          There is no difference between Group #1 and Group
*                #2 (alpha = .05).
*
*   Answer:      Answer(s) can be found in t_inep.lis.  Briefly,
*
*                Computed t  = 3.89
*
*                Criterion t  = 1.697 (alpha = .05, df = 30)
*
*                Computed t (3.89) > Criterion t (1.697)
*
*                Reject Ho ..... differences are significant
*
*                Be sure to rename spss.lis to t_inep.lis.

DATA LIST /
     Group      01
```

```
     Score  03-04.

VARIABLE LABELS
     Group      "Group:  Group 1 or Group 2"
     Score      "Measured Datum".

VALUE LABELS
     Group      1 'Group #1'
                2 'Group #2'.

BEGIN DATA.
1 36
1 35
1 39
1 46
1 31
1 36
1 29
1 31
1 43
1 38
1 33
1 32
1 42
1 47
1 47
1 36
2 26
2 27
2 37
2 29
2 38
2 36
2 29
2 36
2 33
2 24
2 22
2 28
2 25
2 31
2 31
2 30
END DATA.
                              SPSS/PC+ Studentware                    11/26/89
include 't_inep.dat'.
*  Test:       Student's t-test with two independent samples
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     Joseph, Marjory L., and William D. Joseph.
*                   RESEARCH FUNDAMENTALS IN HOME ECONOMICS.
```

Redondo Beach, California: Plycon Press, 1979. ISBN 0-8087-3415-6 Page 182

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Group #1 and Group #2.

Table 1

Summary Data

Group #1				Group #2			
36	35	39	46	26	27	37	29
31	36	29	31	38	36	29	36
43	38	33	32	33	24	22	28
42	47	47	36	25	31	31	30

Note: In addition, calculate descriptive statistics for each group.

Ho: There is no difference between Group #1 and Group #2 (alpha = .05).

Answer: Answer(s) can be found in t_inep.lis. Briefly,

Computed t = 3.89

Criterion t = 1.697 (alpha = .05, df = 30)

Computed t (3.89) > Criterion t (1.697)

Reject Ho ..... differences are significant

Be sure to rename spss.lis to t_inep.lis.

```
DATA LIST /
    Group     01
    Score  03-04.

VARIABLE LABELS
    Group      "Group:  Group 1 or Group 2"
    Score      "Measured Datum".
```

```
VALUE LABELS
     Group      1 'Group #1'
                2 'Group #2'.

BEGIN DATA.
END DATA.
     32 cases are written to the compressed active file.

This procedure was completed at 14:37:13
T-TEST GROUPS = Group (1,2) / VARIABLES = Score.
```

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Independent samples of GROUP Group: Group 1 or Group 2

Group 1: GROUP EQ 1 Group 2: GROUP EQ 2

t-test for: SCORE Measured Datum

	Number of Cases	Mean	Standard Deviation	Standard Error
Group 1	16	37.5625	5.921	1.480
Group 2	16	30.1250	4.843	1.211

		Pooled Variance Estimate			Separate Variance Estimate		
F Value	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.	t Value	Degrees of Freedom	2-Tail Prob.
1.50	.445	3.89	30	.001	3.89	28.86	.001

This procedure was completed at 14:40:06

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```
finish
[Next command's output on page   1
include 't_inep.dat'.
[*  Test:       Student's t-test with two independent samples
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
[*
[*  Source:     Joseph, Marjory L., and William D. Joseph.
[*                   RESEARCH FUNDAMENTALS IN HOME ECONOMICS.
[*                   Redondo Beach, California:  Plycon Press,
[*                   1979.  ISBN 0-8087-3415-6  Page 182
[*
[*  Software:   SPSS/PC+ Studentware
[*
[*  Scenario:   Based on data provided in Table 1, determine if
```

```
[*              there are true differences (alpha = .05) between
[*              Group #1 and Group #2.
[*
[*
[*                                  Table 1
[*
[*                                Summary Data
[*
[*              ____________________________________________________
[*              ____________________________________________________
[*
[*                  Group #1                     Group #2
[*              ____________________________________________________
[*
[*              36   35   39   46           26   27   37   29
[*              31   36   29   31           38   36   29   36
[*              43   38   33   32           33   24   22   28
[*              42   47   47   36           25   31   31   30
[*              ____________________________________________________
[*
[*  Note:       In addition, calculate descriptive statistics for
[*              each group.
[*
[*  Ho:         There is no difference between Group #1 and Group
[*              #2 (alpha = .05).
[*
[*  Answer:     Answer(s) can be found in t_inep.lis.  Briefly,
[*
[*              Computed  t  = 3.89
[*
[*              Criterion t  = 1.697 (alpha = .05, df = 30)
[*
[*              Computed t (3.89) > Criterion t (1.697)
[*
[*              Reject Ho ..... differences are significant
[*
[*              Be sure to rename spss.lis to t_inep.lis.
[
[DATA LIST /
[     Group     01
[     Score   03-04.
[
[VARIABLE LABELS
[     Group     "Group:  Group 1 or Group 2"
[     Score     "Measured Datum".
[
[VALUE LABELS
[     Group     1 'Group #1'
[               2 'Group #2'.
[
[BEGIN DATA.
[1 36
```

```
[1 35
[1 39
[1 46
[1 31
[1 36
[1 29
[1 31
[1 43
[1 38
[1 33
[1 32
[1 42
[1 47
[1 47
[1 36
[2 26
[2 27
[2 37
[2 29
[2 38
[2 36
[2 29
[2 36
[2 33
[2 24
[2 22
[2 28
[2 25
[2 31
[2 31
[2 30
[END DATA.
T-TEST GROUPS = Group (1,2) / VARIABLES = Score.
[Next command's output on page   3
finish
```

Test: Student's t-test with a paired sample

Author: Thomas W. MacFarland, Ed.D.

Source: Joseph, Marjory L., and William D. Joseph. RESEARCH FUNDAMENTALS IN HOME ECONOMICS. Redondo Beach, California: Plycon Press, 1979. ISBN 0-8087-3415-6 Page 190

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Method #1 and Method #2.

Table 1

Summary Data

Pair	Method #1	Method #2
01	27	21
02	22	20
03	18	16
04	26	19
05	19	16
06	18	16
07	24	18
08	16	12
09	14	10
10	13	16
11	13	12
12	12	10

Note: In addition, calculate descriptive statistics for

```
*              each method.
*
*  Ho:         There is no difference between Method #1 and
*              Method #2 (alpha = .05).
*
*  Answer:     Answer(s) can be found in t_pair.lis.  Briefly,
*
*              Computed  t  = 3.85
*
*              Criterion t  = 1.796 (alpha = .05, df = 11)
*
*              Computed t (3.85) > Criterion t (1.796)
*
*              Reject Ho ..... differences are significant
*
*              Be sure to rename spss.lis to t_pair.lis.

DATA LIST /
     Pair     01-02
     Method_1 04-05
     Method_2 07-08.

VARIABLE LABELS
     Pair     "Matched Pair: S1 to M_#1; S2 to M_#2"
     Method_1 "Score for Subject Assigned to Method #1"
     Method_2 "Score for Subject Assigned to Method #2".

BEGIN DATA.
01 27 21
02 22 20
03 18 16
04 26 19
05 19 16
06 18 16
07 24 18
08 16 12
09 14 10
10 13 16
11 13 12
12 12 10
END DATA.
```

SPSS/PC+ Studentware 11/26/89

```
include 't_pair.dat'.
*  Test:       Student's t-test with a paired sample
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     Joseph, Marjory L., and William D. Joseph.
*                   RESEARCH FUNDAMENTALS IN HOME ECONOMICS.
*                   Redondo Beach, California:  Plycon Press,
*                   1979.  ISBN 0-8087-3415-6  Page 190
```

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Method #1 and Method #2.

Table 1

Summary Data

Pair	Method #1	Method #2
01	27	21
02	22	20
03	18	16
04	26	19
05	19	16
06	18	16
07	24	18
08	16	12
09	14	10
10	13	16
11	13	12
12	12	10

Note: In addition, calculate descriptive statistics for each method.

Ho: There is no difference between Method #1 and Method #2 (alpha = .05).

Answer: Answer(s) can be found in t_pair.lis. Briefly,

Computed t = 3.85

```
*
*              Criterion t  = 1.796 (alpha = .05, df = 11)
*
*              Computed t (3.85) > Criterion t (1.796)
*
*              Reject Ho ..... differences are significant
*
*              Be sure to rename spss.lis to t_pair.lis.

DATA LIST /
     Pair     01-02
     Method_1 04-05
     Method_2 07-08.

VARIABLE LABELS
     Pair     "Matched Pair: S1 to M_#1; S2 to M_#2"
     Method_1 "Score for Subject Assigned to Method #1"
     Method_2 "Score for Subject Assigned to Method #2".

BEGIN DATA.
END DATA.
     12 cases are written to the compressed active file.

This procedure was completed at 14:57:23

T-TEST PAIRS = Method_1 Method_2.
-------------------------------------------------------------------------------
Page   2                    SPSS/PC+ Studentware                      11/26/89


Paired samples t-test:  METHOD_1  Score for Subject Assigned to Method #1
                        METHOD_2  Score for Subject Assigned to Method #2

Variable     Number                  Standard    Standard
           of Cases      Mean       Deviation     Error

METHOD_1       12       18.5000        5.231      1.510
METHOD_2       12       15.5000        3.754      1.084


(Difference)  Standard    Standard  3        2-Tail 3     t     Degrees of  2-Tail
     Mean    Deviation      Error   3  Corr. Prob. 3   Value     Freedom     Prob.
                                    3              3
    3.0000      2.697        .778   3   .870  .000 3   3.85        11        .003

This procedure was completed at 14:59:22
finish
[Next command's output on page   1
include 't_pair.dat'.
[*  Test:       Student's t-test with a paired sample
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
```

Source: Joseph, Marjory L., and William D. Joseph. RESEARCH FUNDAMENTALS IN HOME ECONOMICS. Redondo Beach, California: Plycon Press, 1979. ISBN 0-8087-3415-6 Page 190

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Method #1 and Method #2.

Table 1

Summary Data

Pair	Method #1	Method #2
01	27	21
02	22	20
03	18	16
04	26	19
05	19	16
06	18	16
07	24	18
08	16	12
09	14	10
10	13	16
11	13	12
12	12	10

Note: In addition, calculate descriptive statistics for each method.

Ho: There is no difference between Method #1 and

```
[*              Method #2 (alpha = .05).
[*
[*  Answer:     Answer(s) can be found in t_pair.lis.  Briefly,
[*
[*              Computed  t  = 3.85
[*
[*              Criterion t  = 1.796 (alpha = .05, df = 11)
[*
[*              Computed t (3.85) > Criterion t (1.796)
[*
[*              Reject Ho ..... differences are significant
[*
[*              Be sure to rename spss.lis to t_pair.lis.
[
[DATA LIST /
[      Pair      01-02
[      Method_1  04-05
[      Method_2  07-08.
[
[VARIABLE LABELS
[      Pair      "Matched Pair: S1 to M_#1; S2 to M_#2"
[      Method_1  "Score for Subject Assigned to Method #1"
[      Method_2  "Score for Subject Assigned to Method #2".
[
[BEGIN DATA.
[01 27 21
[02 22 20
[03 18 16
[04 26 19
[05 19 16
[06 18 16
[07 24 18
[08 16 12
[09 14 10
[10 13 16
[11 13 12
[12 12 10
[END DATA.
[
T-TEST PAIRS = Method_1 Method_2.
[Next command's output on page   3
finish
```

Test: Chi-square (using all data)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 664

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between type of response and type of commitment to a staged crime.

Table 1

Summary Data

	Commitment	
	Committed	Not Committed
Response		
Intervened	26	6
Did Not Intervene	13	34

Note. For this analysis the following codes are used:

Intervened and Committed 1 1

Intervened and Not Committed 1 2

Did Not Intervene and Committed 2 1

Did Not Intervene and Not Committed ... 2 2

Ho: There is no difference between degree of commitment to victim and response to a staged crime (alpha = .05).

```
*  Answer:     Answer(s) can be found in chi-fq.lis.  Briefly,
*
*              Computed  chi = 19.78
*
*              Criterion chi =  3.84 (alpha = .05, df = 1)
*
*              Computed chi (19.78) > Criterion chi (3.84)
*
*              Reject Ho ..... differences are significant
*
*              Be sure to rename spss.lis to chi-fq.lis.

DATA LIST /
    Response  1
    Commit_t  3.

VARIABLE LABELS
     Response "Response by Bystander to a Staged Crime"
     Commit_t "Extent of Commitment to the Victim".

VALUE LABELS
     Response 1 'Intervened'
              2 'Did Not Intervene' /
     Commit_t 1 'Committed'
              2 'Not Committed'.

BEGIN DATA.
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
1 1
```

```
2 2
2 2
END DATA.
                              SPSS/PC+ Studentware                    11/26/89
include 'chi-fq.dat'.
*  Test:       Chi-square (using all data)
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
*                   California:  Dellen Publishing Company, 1988.
*                   ISBN 0-02-379260-4  Page 664
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine if
*              there are true differences (alpha = .05) between
*              type of response and type of commitment to a
*              staged crime.
*
*                                   Table 1
*
*                              Summary Data
*
*
*
*
*                                                  Commitment
*
*                                          Committed     Not Committed
*
*                    Intervened                26              6
*
*              Response
*
*                Did Not Intervene           13              34
*
*
*              Note.  For this analysis the following codes are
*                     used:
*
*                     Intervened and Committed ..............  1 1
*
*                     Intervened and Not Committed ..........  1 2
*
*                     Did Not Intervene and Committed .......  2 1
*
*                     Did Not Intervene and Not Committed ...  2 2
```

```
*
*  Ho:        There is no difference between degree of commitment
*             to victim and response to a staged crime (alpha =
*             .05).
*
*  Answer:    Answer(s) can be found in chi-fq.lis.  Briefly,
*
*             Computed  chi = 19.78
*
*             Criterion chi =  3.84 (alpha = .05, df = 1)
*
*             Computed chi (19.78) > Criterion chi (3.84)
*
*             Reject Ho ..... differences are significant
*
*             Be sure to rename spss.lis to chi-fq.lis.

DATA LIST /
    Response  1
    Commit_t  3.

VARIABLE LABELS
     Response "Response by Bystander to a Staged Crime"
     Commit_t "Extent of Commitment to the Victim".

VALUE LABELS
     Response 1 'Intervened'
              2 'Did Not Intervene' /
     Commit_t 1 'Committed'
              2 'Not Committed'.

BEGIN DATA.
END DATA.
     79 cases are written to the compressed active file.

This procedure was completed at 15:22:20
CROSSTABS TABLES = Response by Commit_t / OPTIONS 14 15 / STATISTICS 1.


 ***** Given WORKSPACE allows for  3412 Cells with
     2 Dimensions for CROSSTAB problem *****


--------------------------------------------------------------------------------
Page   2                       SPSS/PC+ Studentware                    11/26/89

Crosstabulation:      RESPONSE  Response by Bystander to a Staged Crime
                   By COMMIT_T  Extent of Commitment to the Victim

            Count   |Committe|Not Comm|
COMMIT_TD> Exp Val  |d       |itted   |   Row
           Residual |      1 |      2 | Total
```

RESPONSE			
1 Intervened	26 15.8 10.2	6 16.2 -10.2	32 40.5%
2 Did Not Interven	13 23.2 -10.2	34 23.8 10.2	47 59.5%
Column Total	39 49.4%	40 50.6%	79 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
19.78240	1	.0000	15.797	None
21.87383	1	.0000	(Before Yates Correction)	

Number of Missing Observations = 0

This procedure was completed at 15:24:43
finish
[Next command's output on page 1
include 'chi-fq.dat'.
[* Test: Chi-square (using all data)
[*
[* Author: Thomas W. MacFarland, Ed.D.
[*
[* Source: McClave, James T., and Frank H. Dietrich, II.
[* STATISTICS, 4th edition. San Francisco,
[* California: Dellen Publishing Company, 1988.
[* ISBN 0-02-379260-4 Page 664
[*
[* Software: SPSS/PC+ Studentware
[*
[* Scenario: Based on data provided in Table 1, determine if
[* there are true differences (alpha = .05) between
[* type of response and type of commitment to a
[* staged crime.
[*
[*
[* Table 1
[*
[* Summary Data
[*
[* _____
[* _____
[*
[* Commitment

	Committed	Not Committed
Intervened	26	6
Response		
Did Not Intervene	13	34

Note. For this analysis the following codes are used:

Intervened and Committed 1 1

Intervened and Not Committed 1 2

Did Not Intervene and Committed 2 1

Did Not Intervene and Not Committed ... 2 2

Ho: There is no difference between degree of commitment to victim and response to a staged crime (alpha = .05).

Answer: Answer(s) can be found in chi-fq.lis. Briefly,

Computed chi = 19.78

Criterion chi = 3.84 (alpha = .05, df = 1)

Computed chi (19.78) > Criterion chi (3.84)

Reject Ho ..... differences are significant

Be sure to rename spss.lis to chi-fq.lis.

```
DATA LIST /
    Response  1
    Commit_t  3.

VARIABLE LABELS
     Response "Response by Bystander to a Staged Crime"
     Commit_t "Extent of Commitment to the Victim".

VALUE LABELS
     Response 1 'Intervened'
              2 'Did Not Intervene' /
     Commit_t 1 'Committed'
              2 'Not Committed'.
```

```
[
[BEGIN DATA.
[1 1
[1 1
[1 1
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```
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[2 2
[END DATA.
CROSSTABS TABLES = Response by Commit_t / OPTIONS 14 15 / STATISTICS 1.
[Next command's output on page   4
finish
```

Test: Chi-square (using WEIGHT, to avoid extra keying)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 650

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between car size and manufacturer.

Table 1

Summary Data

		Manufacturer			
		A	B	C	D
Car Size	Small	157	65	181	10
	Intermediate	126	82	142	46
	Large	58	45	60	28

Note. For this analysis the following codes are used:

Small Car and Manufacturer A 1 1

Small Car and Manufacturer B 1 2

Small Car and Manufacturer C 1 3

Small Car and Manufacturer D 1 4

Intermediate Car and Manufacturer A ... 2 1

Intermediate Car and Manufacturer B ... 2 2

Intermediate Car and Manufacturer C ... 2 3

```
*
*                    Intermediate Car and Manufacturer D ... 2 4
*
*                    Large Car and Manufacturer A ......... 3 1
*
*                    Large Car and Manufacturer B ......... 3 2
*
*                    Large Car and Manufacturer C ......... 3 3
*
*                    Large Car and Manufacturer D ......... 3 4
*
*  Ho:          There is no difference between car size amd type
*               of manufacturer (alpha = .05).
*
*  Answer:      Answer(s) can be found in chi-wt.lis.  Briefly,
*
*               Computed  chi  = 45.81
*
*               Criterion chi  = 12.59 (alpha = .05, df = 6)
*
*               Computed chi = (45.81) > Criterion chi (12.59)
*
*               Reject Ho ..... differences are significant
*
*               Be sure to rename spss.lis to chi-wt.lis.

DATA LIST /
     Freq      01-03
     Car          05
     Manuf_er     07.

WEIGHT by Freq.

VARIABLE LABELS
     Freq      "Summative Frequency Count"
     Car       "Type (e.g., size) of Car"
     Manuf_er "Manufacturer".

VALUE LABELS
     Car       1 'Small'  2 'Intermediate' 3 'Large' /
     Manuf_er 1 'A'       2 'B'            3 'C'     4 'D'.

BEGIN DATA.
157 1 1
065 1 2
181 1 3
010 1 4
126 2 1
082 2 2
142 2 3
046 2 4
058 3 1
```

```
045 3 2
060 3 3
028 3 4
END DATA.
```

SPSS/PC+ Studentware 11/26/89

```
include 'chi-wt.dat'.
*  Test:      Chi-square (using WEIGHT, to avoid extra keying)
*
*  Author:    Thomas W. MacFarland, Ed.D.
*
*  Source:    McClave, James T., and Frank H. Dietrich, II.
*                  STATISTICS, 4th edition.  San Francisco,
*                  California:  Dellen Publishing Company, 1988.
*                  ISBN 0-02-379260-4  Page 650
*
*  Software:  SPSS/PC+ Studentware
*
*  Scenario:  Based on data provided in Table 1, determine if
*             there are true differences (alpha = .05) between
*             car size and manufacturer.
*
*
*                          Table 1
*
*                       Summary Data
*
```

		Manufacturer			
		A	B	C	D
	Small	157	65	181	10
Car Size	Intermediate	126	82	142	46
	Large	58	45	60	28

Note. For this analysis the following codes are used:

Small Car and Manufacturer A 1 1

Small Car and Manufacturer B 1 2

Small Car and Manufacturer C 1 3

```
*                   Small Car and Manufacturer D ..... 1 4
*
*                   Intermediate Car and Manufacturer A ... 2 1
*
*                   Intermediate Car and Manufacturer B ... 2 2
*
*                   Intermediate Car and Manufacturer C ... 2 3
*
*                   Intermediate Car and Manufacturer D ... 2 4
*
*                   Large Car and Manufacturer A ..... 3 1
*
*                   Large Car and Manufacturer B ..... 3 2
*
*                   Large Car and Manufacturer C ..... 3 3
*
*                   Large Car and Manufacturer D ..... 3 4
*
*  Ho:          There is no difference between car size amd type
*               of manufacturer (alpha = .05).
*
*  Answer:      Answer(s) can be found in chi-wt.lis.  Briefly,
*
*               Computed  chi  = 45.81
*
*               Criterion chi  = 12.59 (alpha = .05, df = 6)
*
*               Computed chi = (45.81) > Criterion chi (12.59)
*
*               Reject Ho ..... differences are significant
*
*               Be sure to rename spss.lis to chi-wt.lis.

DATA LIST /
     Freq      01-03
     Car          05
     Manuf_er     07.

WEIGHT by Freq.

VARIABLE LABELS
     Freq      "Summative Frequency Count"
     Car       "Type (e.g., size) of Car"
     Manuf_er "Manufacturer".

VALUE LABELS
     Car       1 'Small'  2 'Intermediate' 3 'Large' /
     Manuf_er 1 'A'       2 'B'             3 'C'     4 'D'.

BEGIN DATA.
END DATA.
     12 cases are written to the compressed active file.
```

This procedure was completed at 15:45:40

CROSSTABS TABLES = Car by Manuf_er / OPTIONS 14 15 / STATISTICS 1.

***** Given WORKSPACE allows for 3412 Cells with
2 Dimensions for CROSSTAB problem *****

Crosstabulation: CAR Type (e.g., size) of Car
By MANUF_ER Manufacturer

MANUF_ERD> / CAR	Count / Exp Val / Residual	A 1	B 2	C 3	D 4	Row Total
Small	1	157	65	181	10	413
		140.8	79.3	158.2	34.7	41.3%
		16.2	-14.3	22.8	-24.7	
Intermediate	2	126	82	142	46	396
		135.0	76.0	151.7	33.3	39.6%
		-9.0	6.0	-9.7	12.7	
Large	3	58	45	60	28	191
		65.1	36.7	73.2	16.0	19.1%
		-7.1	8.3	-13.2	12.0	
	Column Total	341 34.1%	192 19.2%	383 38.3%	84 8.4%	1000 100.0%

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F.< 5
45.81247	6	.0000	16.044	None

Number of Missing Observations = 0

This procedure was completed at 15:47:33
finish
[Next command's output on page 1
include 'chi-wt.dat'.
[* Test: Chi-square (using WEIGHT, to avoid extra keying)
[*
[* Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 650

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between car size and manufacturer.

Table 1

Summary Data

		Manufacturer			
		A	B	C	D
Car Size	Small	157	65	181	10
	Intermediate	126	82	142	46
	Large	58	45	60	28

Note. For this analysis the following codes are used:

Small Car and Manufacturer A 1 1

Small Car and Manufacturer B 1 2

Small Car and Manufacturer C 1 3

Small Car and Manufacturer D 1 4

Intermediate Car and Manufacturer A ... 2 1

Intermediate Car and Manufacturer B ... 2 2

Intermediate Car and Manufacturer C ... 2 3

Intermediate Car and Manufacturer D ... 2 4

```
[*                    Large Car and Manufacturer A ..... 3 1
[*
[*                    Large Car and Manufacturer B ..... 3 2
[*
[*                    Large Car and Manufacturer C ..... 3 3
[*
[*                    Large Car and Manufacturer D ..... 3 4
[*
[*  Ho:          There is no difference between car size amd type
[*               of manufacturer (alpha = .05).
[*
[*  Answer:      Answer(s) can be found in chi-wt.lis.  Briefly,
[*
[*               Computed  chi  = 45.81
[*
[*               Criterion chi  = 12.59 (alpha = .05, df = 6)
[*
[*               Computed chi = (45.81) > Criterion chi (12.59)
[*
[*               Reject Ho ..... differences are significant
[*
[*               Be sure to rename spss.lis to chi-wt.lis.
[
[DATA LIST /
[     Freq      01-03
[     Car          05
[     Manuf_er     07.
[
[WEIGHT by Freq.
[
[VARIABLE LABELS
[     Freq      "Summative Frequency Count"
[     Car       "Type (e.g., size) of Car"
[     Manuf_er "Manufacturer".
[
[VALUE LABELS
[     Car       1 'Small'  2 'Intermediate' 3 'Large' /
[     Manuf_er 1 'A'       2 'B'            3 'C'     4 'D'.
[
[BEGIN DATA.
[157 1 1
[065 1 2
[181 1 3
[010 1 4
[126 2 1
[082 2 2
[142 2 3
[046 2 4
[058 3 1
[045 3 2
[060 3 3
[028 3 4
```

```
[END DATA.
[
CROSSTABS TABLES = Car by Manuf_er / OPTIONS 14 15 / STATISTICS 1.
[Next command's output on page   4
finish
```

Test: Pearson's product-moment coefficient of correlation

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 719

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there is a correlation (alpha = .05) between number of games won (baseball) and team batting average. (American League teams from the 1986 season will serve as the example for this exercise).

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253

```
*              Kansas City                76              .252
*
*              Oakland                    76              .252
*
*              Chicago                    72              .247
*
*
*  Ho:         There is no association between number of games won
*              and team batting average (alpha = .05).
*
*  Answer:     Answer(s) can be found in pearson.lis.  Briefly,
*
*              Computed  r  = .600
*
*              Criterion r  = .458 (alpha = .05, n = 14)
*
*              Computed r (.600) > Criterion r (.458)
*
*              Reject Ho ..... the association is significant
*
*              Be sure to rename spss.lis to pearson.lis.
*
*  Note:       Use (a) to signify an alphabetical string when key-
*              ing baseball teams.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
New_York             90 .271
Boston               95 .271
Toronto              86 .269
Texas                87 .267
Detroit              87 .263
Minnesota            71 .261
Baltimore            73 .258
California           92 .255
Milwaukee            77 .255
Seattle              67 .253
Kansas_City          76 .252
Oakland              76 .252
Chicago              72 .247
END DATA.
```

```
include 'pearson.dat'.
*  Test:       Pearson's product-moment coefficient of
*              correlation
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
*                   California:  Dellen Publishing Company, 1988.
*                   ISBN 0-02-379260-4  Page 719
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine if
*              there is a correlation (alpha = .05) between number
*              of games won (baseball) and team batting average.
*              (American League teams from the 1986 season will
*              serve as the example for this exercise).
*
*
*                                  Table 1
*
*                               Summary Data
*
*
*              ___________________________________________________
*              ___________________________________________________
*
*                                  Number of Games    Team Batting
*              Team                      Won            Average
*              ___________________________________________________
*
*              Cleveland                 84               .284
*
*              New York                  90               .271
*
*              Boston                    95               .271
*
*              Toronto                   86               .269
*
*              Texas                     87               .267
*
*              Detroit                   87               .263
*
*              Minnesota                 71               .261
*
*              Baltimore                 73               .258
*
*              California                92               .255
*
*              Milwaukee                 77               .255
*
*              Seattle                   67               .253
```

```
*
*              Kansas City                76              .252
*
*              Oakland                    76              .252
*
*              Chicago                    72              .247
*
*
*  Ho:         There is no association between number of games won
*              and team batting average (alpha = .05).
*
*  Answer:     Answer(s) can be found in pearson.lis.  Briefly,
*
*              Computed  r  = .600
*
*              Criterion r  = .458 (alpha = .05, n = 14)
*
*              Computed r (.600) > Criterion r (.458)
*
*              Reject Ho ..... the association is significant
*
*              Be sure to rename spss.lis to pearson.lis.
*
*  Note:       Use (a) to signify an alphabetical string when key-
*              ing baseball teams.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
END DATA.
     14 cases are written to the compressed active file.

This procedure was completed at 16:20:18
CORRELATION VARIABLES = G_Won with TBA / OPTIONS 3 5 / STATISTICS 1.
```

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Variable	Cases	Mean	Std Dev
G_WON	14	80.9286	8.8184
TBA	14	.2613	.0101

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```
Correlations:  TBA

  G_WON          .6003
                (   14)
                P= .023


(Coefficient / (Cases) / 2-tailed Significance)

" . " is printed if a coefficient cannot be computed

This procedure was completed at 16:21:33
finish
[Next command's output on page   1
include 'pearson.dat'.
[*  Test:       Pearson's product-moment coefficient of
[*              correlation
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
[*
[*  Source:     McClave, James T., and Frank H. Dietrich, II.
[*                   STATISTICS, 4th edition.  San Francisco,
[*                   California:  Dellen Publishing Company, 1988.
[*                   ISBN 0-02-379260-4  Page 719
[*
[*  Software:   SPSS/PC+ Studentware
[*
[*  Scenario:   Based on data provided in Table 1, determine if
[*              there is a correlation (alpha = .05) between number
[*              of games won (baseball) and team batting average.
[*              (American League teams from the 1986 season will
[*              serve as the example for this exercise).
[*
[*
[*                                   Table 1
[*
[*                              Summary Data
[*
[*              ------------------------------------------------
[*              ------------------------------------------------
[*              Team            Number of Games Won   Team Batting Average
[*              ------------------------------------------------
[*
[*              Cleveland               84                .284
[*
[*              New York                90                .271
[*
[*              Boston                  95                .271
[*
[*              Toronto                 86                .269
```

Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Answer: Answer(s) can be found in pearson.lis. Briefly,

Computed r = .600

Criterion r = .458 (alpha = .05, n = 14)

Computed r (.600) > Criterion r (.458)

Reject Ho ..... the association is significant

Be sure to rename spss.lis to pearson.lis.

Note: Use (a) to signify an alphabetical string when keying baseball teams.

```
DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
```

```
[New_York                90 .271
[Boston                  95 .271
[Toronto                 86 .269
[Texas                   87 .267
[Detroit                 87 .263
[Minnesota               71 .261
[Baltimore               73 .258
[California              92 .255
[Milwaukee               77 .255
[Seattle                 67 .253
[Kansas_City             76 .252
[Oakland                 76 .252
[Chicago                 72 .247
[END DATA.
CORRELATION VARIABLES = G_Won with TBA / OPTIONS 3 5 / STATISTICS 1.
[Next command's output on page   4
finish
```

Test: Oneway Analysis of Variance (ANOVA), with mean comparison (e.g., Tukey)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 505

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Nematocides #1, #2, #3, and #4.

Table 1

Yield (Pounds per Plot for the Same Variety of Tomatoes) by Nematocide Treatment

Nematocide			
1	2	3	4
18.6	18.7	19.4	19.0
18.2	19.3	19.9	18.5
17.6	18.9	19.7	18.6
		19.1	

Note: In addition, calculate descriptive statistics for each group.

Ho: There is no difference in yield between nematocide treatments #1, #2, #3, and #4 (alpha = .05).

Answer: Answer(s) can be found in anova1.lis. Briefly,

Computed F = 8.63

Criterion F = 3.86 (alpha = .05, df = 3, 9)

```
*               Computed F (8.63) > Criterion F (3.86)
*
*               Reject Ho ..... differences are significant
*
*               Based on the use of Tukey mean comparison,
*
*               Nematocide #3 (19.53) > Nematocide # 1 (18.13).
*
*               The difference between all other comparisons
*               is due to chance.
*
*               Be sure to rename spss.lis to anova1.lis.

DATA LIST /
    Group          01
    Yield       03-06.

VARIABLE LABELS
    Group       "One of Four Nematocides (a Pesticide)"
    Yield       "Yield of the Same Tomato Variety (Pounds/Plot)".

VALUE LABELS
    Group       1 'Nematocide #1'
                2 'Nematocide #2'
                3 'Nematocide #3'
                4 'Nematocide #4'.

BEGIN DATA.
1 18.6
1 18.2
1 17.6
2 18.7
2 19.3
2 18.9
3 19.4
3 19.9
3 19.7
3 19.1
4 19.0
4 18.5
4 18.6
END DATA.
                                SPSS/PC+ Studentware                    11/26/89
include 'anova1.dat'.
*  Test:        Oneway Analysis of Variance (ANOVA), with
*               mean comparison (e.g., Tukey)
*
*  Author:      Thomas W. MacFarland, Ed.D.
*
*  Source:      McClave, James T., and Frank H. Dietrich, II.
*                    STATISTICS, 4th edition.  San Francisco,
*                    California:  Dellen Publishing Company, 1988.
```

ISBN 0-02-379260-4 Page 505

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between Nematocides #1, #2, #3, and #4.

Table 1

Yield (Pounds per Plot for the Same Variety of Tomatoes) by Nematocide Treatment

Nematocide			
1	2	3	4
18.6	18.7	19.4	19.0
18.2	19.3	19.9	18.5
17.6	18.9	19.7	18.6
		19.1	

Note: In addition, calculate descriptive statistics for each group.

Ho: There is no difference in yield between nematocide treatments #1, #2, #3, and #4 (alpha = .05).

Answer: Answer(s) can be found in anova1.lis. Briefly,

Computed F = 8.63

Criterion F = 3.86 (alpha = .05, df = 3, 9)

Computed F (8.63) > Criterion F (3.86)

Reject Ho ..... differences are significant

Based on the use of Tukey mean comparison,

Nematocide #3 (19.53) > Nematocide # 1 (18.13).

```
*             The difference between all other comparisons
*             is due to chance.
*
*             Be sure to rename spss.lis to anova1.lis.

DATA LIST /
    Group        01
    Yield     03-06.

VARIABLE LABELS
    Group     "One of Four Nematocides (a Pesticide)"
    Yield     "Yield of the Same Tomato Variety (Pounds/Plot)".

VALUE LABELS
    Group     1 'Nematocide #1'
              2 'Nematocide #2'
              3 'Nematocide #3'
              4 'Nematocide #4'.

BEGIN DATA.
END DATA.
     13 cases are written to the compressed active file.

This procedure was completed at 19:53:35
ONEWAY Yield by Group (1,4) / RANGES = TUKEY / STATISTICS 1.
```

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- - - - - - - - - - O N E W A Y - - - - - - - - - -

Variable YIELD Yield of the Same Tomato Variety (Pounds
By Variable GROUP One of Four Nematocides (a Pesticide)

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	3.4561	1.1520	8.6342	.0052
Within Groups	9	1.2008	.1334		
Total	12	4.6569			

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- - - - - - - - - - O N E W A Y - - - - - - - - - -

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean

Grp 1	3	18.1333	.5033	.2906	16.8830	To	19.3837
Grp 2	3	18.9667	.3055	.1764	18.2077	To	19.7256
Grp 3	4	19.5250	.3500	.1750	18.9681	To	20.0819
Grp 4	3	18.7000	.2646	.1528	18.0428	To	19.3572
Total	13	18.8846	.6230	.1728	18.5082	To	19.2611

Group	Minimum	Maximum
Grp 1	17.6000	18.6000
Grp 2	18.7000	19.3000
Grp 3	19.1000	19.9000
Grp 4	18.5000	19.0000
Total	17.6000	19.9000

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable YIELD Yield of the Same Tomato Variety (Pounds
By Variable GROUP One of Four Nematocides (a Pesticide)

Multiple Range Test

Tukey-HSD Procedure
Ranges for the .050 level -

4.41 4.41 4.41

The ranges above are table ranges.
The value actually compared with Mean(J)-Mean(I) is..
.2583 * Range * Sqrt(1/N(I) + 1/N(J))

(*) Denotes pairs of groups significantly different at the .050 level

---

- - - - - - - - - - - O N E W A Y - - - - - - - - - - -

Variable YIELD Yield of the Same Tomato Variety (Pounds
(Continued)

G G G G
r r r r

```
                        p p p p
     Mean       Group   1 4 2 3

    18.1333     Grp 1
    18.7000     Grp 4
    18.9667     Grp 2
    19.5250     Grp 3   *

This procedure was completed at 19:56:46
finish
[Next command's output on page   1
include 'anova1.dat'.
[*  Test:       Oneway Analysis of Variance (ANOVA), with
[*              mean comparison (e.g., Tukey)
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
[*
[*  Source:     McClave, James T , and Frank H. Dietrich, II.
[*                   STATISTICS, 4th edition.  San Francisco,
[*                   California:  Dellen Publishing Company, 1988.
[*                   ISBN 0-02-379260-4  Page 505
[*
[*  Software:   SPSS/PC+ Studentware
[*
[*  Scenario:   Based on data provided in Table 1, determine if
[*              there are true differences (alpha = .05) between
[*              Nematocides #1, #2, #3, and #4.
[*
[*
[*                                  Table 1
[*
[*                Yield (Pounds per Plot for the Same Variety of
[*                      Tomatoes) by Nematocide Treatment
[*
[*
[*
[*
[*                                  Nematocide
[*
[*                     1          2          3          4
[*
[*                   18.6       18.7       19.4       19.0
[*
[*                   18.2       19.3       19.9       18.5
[*
[*                   17.6       18.9       19.7       18.6
[*
[*                                         19.1
[*
```

```
[*
[*  Note:       In addition, calculate descriptive statistics for
[*              each group.
[*
[*  Ho:         There is no difference in yield between nematocide
[*              treatments #1, #2, #3, and #4 (alpha = .05).
[*
[*  Answer:     Answer(s) can be found in anova1.lis.  Briefly,
[*
[*              Computed  F  = 8.63
[*
[*              Criterion F  = 3.86 (alpha = .05, df = 3, 9)
[*
[*              Computed F (8.63) > Criterion F (3.86)
[*
[*              Reject Ho ..... differences are significant
[*
[*              Based on the use of Tukey mean comparison,
[*
[*              Nematocide #3 (19.53) > Nematocide # 1 (18.13).
[*
[*              The difference between all other comparisons
[*              is due to chance.
[*
[*              Be sure to rename spss.lis to anova1.lis.
[
[DATA LIST /
[     Group          01
[     Yield       03-06.
[
[VARIABLE LABELS
[     Group       "One of Four Nematocides (a Pesticide)"
[     Yield       "Yield of the Same Tomato Variety (Pounds/Plot)".
[
[VALUE LABELS
[     Group       1 'Nematocide #1'
[                 2 'Nematocide #2'
[                 3 'Nematocide #3'
[                 4 'Nematocide #4'.
[
[BEGIN DATA.
[1 18.6
[1 18.2
[1 17.6
[2 18.7
[2 19.3
[2 18.9
[3 19.4
[3 19.9
[3 19.7
[3 19.1
[4 19.0
```

```
[4 18.5
[4 18.6
[END DATA.
ONEWAY Yield by Group (1,4) / RANGES = TUKEY / STATISTICS 1.
[Next command's output on page   6
finish
```

Test: Twoway Analysis of Variance (ANOVA)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 544

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between type of display, pricing, and interaction(s) of display and pricing.

Table 1

Summary Data on In-store Promotions: Unit Sales by Display and Pricing Strategy

	Pricing Strategy		
Display	Regular	Reduced	Sell at Cost
Normal	989	1,211	1,577
	1,025	1,215	1,559
	1,030	1,182	1,598
Normal Plus	1,191	1,860	2,492
	1,233	1,910	2,527
	1,221	1,926	2,511
Twice Normal	1,226	1,516	1,801
	1,202	1,501	1,833
	1,180	1,498	1,852

Note: In addition, calculate descriptive statistics for each group.

Ho: There is no difference in unit sales between variations of in-store promotional displays and pricing strategies (alpha = .05).

Answer: Answer(s) can be found in anova2.lis. Briefly,

```
*              there are significant differences between:
*
*              1.  type of display
*
*              2.  pricing strategy
*
*              3.  interactions between display and pricing
*
*              ================================================
*                                                    Signif
*              Source of Variation          F      of Prob.
*
*              Main Effects              2415.632     .000
*                DISPLAY                 1709.373     .000
*                PRICE                   3121.892     .000
*
*              2-way Interactions
*                DISPLAY  PRICE           258.067     .000
*              ================================================
*
*              Reject Ho ..... differences are significant
*
*              Be sure to rename spss.lis to anova2.lis.

DATA LIST /
     Treat_mt 01-02
     Display     04
     Price       06
     Sales    08-11.

VARIABLE LABELS
     Treat_mt "Treatment # (3 Treatments/Cell x 9 Cells)"
     Display  "Type of In-store Promotional Display"
     Price    "Pricing Strategy"
     Sales    "Unit Sales ($) for the Promoted Item".

VALUE LABELS
     Display  1 'Normal'   2 'Normal Plus'   3 'Twice Normal' /
     Price    1 'Regular'  2 'Reduced'       3 'Sell at Cost'.

BEGIN DATA.
01 1 1 0989
02 1 1 1025
03 1 1 1030
04 1 2 1211
05 1 2 1215
06 1 2 1182
07 1 3 1577
08 1 3 1559
09 1 3 1598
10 2 1 1191
11 2 1 1233
```

```
.2 2 1 1221
.3 2 2 1860
.4 2 2 1910
.5 2 2 1926
.6 2 3 2492
.7 2 3 2527
.8 2 3 2511
.9 3 1 1226
:0 3 1 1202
:1 3 1 1180
:2 3 2 1516
:3 3 2 1501
:4 3 2 1498
:5 3 3 1801
:6 3 3 1833
:7 3 3 1852
END DATA.
```

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```
include 'anova2.dat'.
```

Test: Twoway Analysis of Variance (ANOVA)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 544

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between type of display, pricing, and interaction(s) of display and pricing.

Table 1

Summary Data on In-store Promotions: Unit Sales by Display and Pricing Strategy

	Pricing Strategy		
Display	Regular	Reduced	Sell at Cost
	989	1,211	1,577
Normal	1,025	1,215	1,559

```
*                          1,030       1,182       1,598
*
*                          1,191       1,860       2,492
*              Normal Plus 1,233       1,910       2,527
*                          1,221       1,926       2,511
*
*                          1,226       1,516       1,801
*              Twice Normal 1,202      1,501       1,833
*                          1,180       1,498       1,852
*
*
*   Note:      In addition, calculate descriptive statistics for
*              each group.
*
*   Ho:        There is no difference in unit sales between
*              variations of in-store promotional displays and
*              pricing strategies (alpha = .05).
*
*   Answer:    Answer(s) can be found in anova2.lis.  Briefly,
*              there are significant differences between:
*
*              1.  type of display
*
*              2.  pricing strategy
*
*              3.  interactions between display and pricing
*
*              ================================================
*                                                    Signif
*              Source of Variation          F       of Prob.
*
*              Main Effects              2415.632      .000
*                DISPLAY                 1709.373      .000
*                PRICE                   3121.892      .000
*
*              2-way Interactions
*                DISPLAY  PRICE           258.067      .000
*              ================================================
*
*              Reject Ho ..... differences are significant
*
*              Be sure to rename spss.lis to anova2.lis.

DATA LIST /
     Treat_mt 01-02
     Display     04
     Price       06
     Sales    08-11.

VARIABLE LABELS
     Treat_mt "Treatment # (3 Treatments/Cell x 9 Cells)"
     Display  "Type of In-store Promotional Display"
```

```
     Price     "Pricing Strategy"
     Sales     "Unit Sales ($) for the Promoted Item".

VALUE LABELS
     Display   1 'Normal'    2 'Normal Plus'    3 'Twice Normal' /
     Price     1 'Regular'   2 'Reduced'        3 'Sell at Cost'.

BEGIN DATA.
END DATA.
     27 cases are written to the compressed active file.

This procedure was completed at 20:44:32
ANOVA Sales by Display (1,3) Price (1,3) / STATISTICS 3.
```

---

* * * C E L L M E A N S * * *

```
            SALES     Unit Sales ($) for the Promoted Item
         BY DISPLAY   Type of In-store Promotional Display
            PRICE     Pricing Strategy


TOTAL POPULATION

  1550.59
 (    27)


DISPLAY
        1          2          3

  1265.11    1874.56    1512.11
 (     9)   (     9)   (     9)
```

```
PRICE
        1          2          3

  1144.11    1535.44    1972.22
 (     9)   (     9)   (     9)



          PRICE
                 1          2          3
DISPLAY
        1    1014.67    1202.67    1578.00
            (     3)   (     3)   (     3)
```

```
        2   1215.00   1898.67   2510.00
            (     3)  (     3)  (     3)

        3   1202.67   1505.00   1828.67
            (     3)  (     3)  (     3)
```

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* * * A N A L Y S I S O F V A R I A N C E * * *

SALES Unit Sales ($) for the Promoted Item
BY DISPLAY Type of In-store Promotional Display
PRICE Pricing Strategy

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif of F
Main Effects	4780446.370	4	1195111.593	2415.632	.000
DISPLAY	1691392.519	2	845696.259	1709.373	.000
PRICE	3089053.852	2	1544526.926	3121.892	.000
2-way Interactions	510704.815	4	127676.204	258.067	.000
DISPLAY PRICE	510704.815	4	127676.204	258.067	.000
Explained	5291151.185	8	661393.898	1336.849	.000
Residual	8905.333	18	494.741		
Total	5300056.519	26	203848.328		

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```
     27 Cases were processed.
      0 Cases (   .0 PCT) were missing.

This procedure was completed at 20:48:21
finish
[Next command's output on page   1
include 'anova2.dat'.
[*  Test:      Twoway Analysis of Variance (ANOVA)
[*
[*  Author:    Thomas W. MacFarland, Ed.D.
[*
[*  Source:    McClave, James T., and Frank H. Dietrich, II.
[*                  STATISTICS, 4th edition.  San Francisco,
[*                  California:  Dellen Publishing Company, 1988.
[*                  ISBN 0-02-379260-4  Page 544
[*
```

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there are true differences (alpha = .05) between type of display, pricing, and interaction(s) of display and pricing.

Table 1

Summary Data on In-store Promotions: Unit Sales by Display and Pricing Strategy

	Pricing Strategy		
Display	Regular	Reduced	Sell at Cost
Normal	989	1,211	1,577
	1,025	1,215	1,559
	1,030	1,182	1,598
Normal Plus	1,191	1,860	2,492
	1,233	1,910	2,527
	1,221	1,926	2,511
Twice Normal	1,226	1,516	1,801
	1,202	1,501	1,833
	1,180	1,498	1,852

Note: In addition, calculate descriptive statistics for each group.

Ho: There is no difference in unit sales between variations of in-store promotional displays and pricing strategies (alpha = .05).

Answer: Answer(s) can be found in anova2.lis. Briefly, there are significant differences between:

1. type of display
2. pricing strategy
3. interactions between display and pricing

```
[*
[*                Source of Variation          F       Signif
[*                                                     of Prob.
[*
[*                Main Effects               2415.632     .000
[*                  DISPLAY                  1709.373     .000
[*                  PRICE                    3121.892     .000
[*
[*                2-way Interactions
[*                  DISPLAY  PRICE            258.067     .000
[*               ================================================
[*
[*                Reject Ho ..... differences are significant
[*
[*                Be sure to rename spss.lis to anova2.lis.
[
[DATA LIST /
[      Treat_mt 01-02
[      Display    04
[      Price      06
[      Sales    08-11.
[
[VARIABLE LABELS
[      Treat_mt "Treatment # (3 Treatments/Cell x 9 Cells)"
[      Display  "Type of In-store Promotional Display"
[      Price    "Pricing Strategy"
[      Sales    "Unit Sales ($) for the Promoted Item".
[
[VALUE LABELS
[      Display  1 'Normal'   2 'Normal Plus'   3 'Twice Normal' /
[      Price    1 'Regular'  2 'Reduced'       3 'Sell at Cost'.
[
[BEGIN DATA.
[01 1 1 0989
[02 1 1 1025
[03 1 1 1030
[04 1 2 1211
[05 1 2 1215
[06 1 2 1182
[07 1 3 1577
[08 1 3 1559
[09 1 3 1598
[10 2 1 1191
[11 2 1 1233
[12 2 1 1221
[13 2 2 1860
[14 2 2 1910
[15 2 2 1926
[16 2 3 2492
[17 2 3 2527
[18 2 3 2511
[19 3 1 1226
[20 3 1 1202
```

```
[21 3 1 1180
[22 3 2 1516
[23 3 2 1501
[24 3 2 1498
[25 3 3 1801
[26 3 3 1833
[27 3 3 1852
[END DATA.
ANOVA Sales by Display (1,3) Price (1,3) / STATISTICS 3.
[Next command's output on page   6
finish
```

* Test: Using PLOT to display data associated with a correlation study (Pearson's product-moment coefficient of correlation)

* Author: Thomas W. MacFarland, Ed.D.

* Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 719

* Software: SPSS/PC+ Studentware

* Scenario: Based on data provided in Table 1, determine if there is a correlation (alpha = .05) between number of games won (baseball) and team batting average. (American League teams from the 1986 season will serve as the example for this exercise).

* Plot the association.

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Clevelar	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255

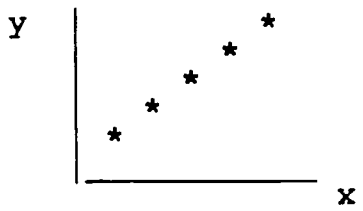
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Note. Use (a) to signify an alphabetical string when keying baseball teams.

Answer: Answer(s) can be found in plot1.lis. Briefly,

Computed r = .600, a generally moderate positive association.



Representation of a positive correlation

Be sure to rename spss.lis to plot1.lis.

```
DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
New_York             90 .271
Boston               95 .271
Toronto              86 .269
Texas                87 .267
Detroit              87 .263
Minnesota            71 .261
Baltimore            73 .258
California           92 .255
Milwaukee            77 .255
```

```
Seattle                  67 .253
Kansas_City              76 .252
Oakland                  76 .252
Chicago                  72 .247
END DATA.
                            SPSS/PC+ Studentware                      11/26/89
include 'plot1.dat'.
*  Test:       Using PLOT to display data associated with a
*              correlation study (Pearson's product-moment
*              coefficient of correlation)
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
*                   California:  Dellen Publishing Company, 1988.
*                   ISBN 0-02-379260-4  Page 719
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine if
*              there is a correlation (alpha = .05) between number
*              of games won (baseball) and team batting average.
*              (American League teams from the 1986 season will
*              serve as the example for this exercise).
*
*              Plot the association.
*
*
*                                  Table 1
*
*                               Summary Data
*
*
*              ___________________________________________________
*              ___________________________________________________
*
*                                    Number of Games    Team Batting
*              Team                        Won             Average
*              ___________________________________________________
*
*              Cleveland                   84               .284
*
*              New York                    90               .271
*
*              Boston                      95               .271
*
*              Toronto                     86               .269
*
*              Texas                       87               .267
*
*              Detroit                     87               .263
*
```

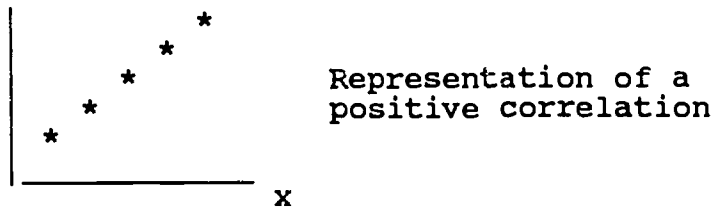
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Note. Use (a) to signify an alphabetical string when keying baseball teams.

Answer: Answer(s) can be found in plot1.lis. Briefly,

Computed r = .600, a generally moderate positive association.



Representation of a positive correlation

Be sure to rename spss.lis to plot1.lis.

```
DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
END DATA.
     14 cases are written to the compressed active file.
```

```
This procedure was completed at 21:32:48
PLOT HSIZE = 36 / VSIZE = 14 / FORMAT = REGRESSION / PLOT = G_Won with TBA.
PLOT requires 3664 BYTES of workspace for execution.
```

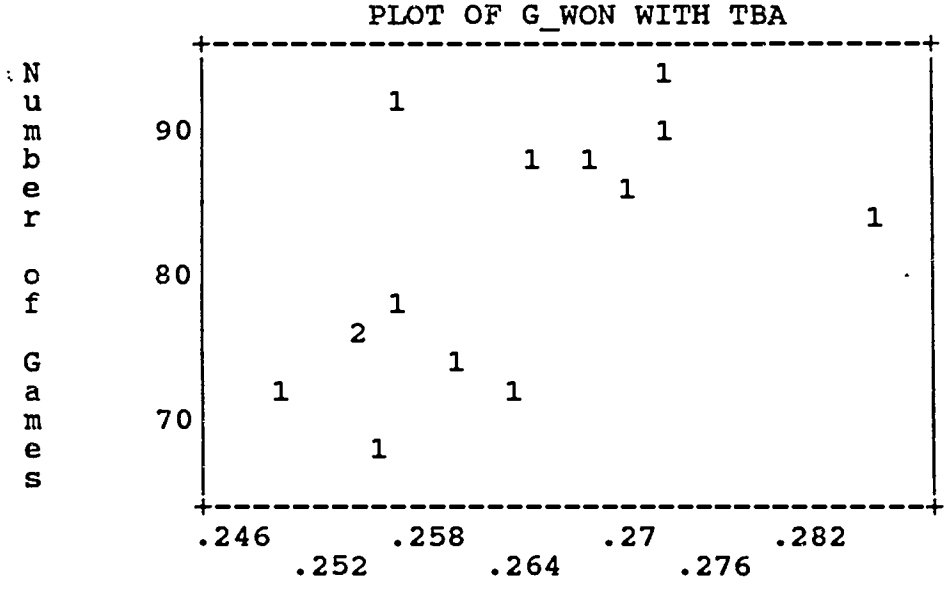
```
Page   2                    SPSS/PC+ Studentware                    11/26/89

* * * * * * * * * * * * * * * * * P L O T * * * * * * * * * * * * * * * * *

Data   Information

         14 unweighted cases accepted.
```

```
Page   3                    SPSS/PC+ Studentware                    11/26/89
```



```
Page   4                    SPSS/PC+ Studentware                    11/26/89
14 cases plotted. Regression statistics of G_WON on TBA:
Correlation  .60025 R Squared  .36030  S.E. of Est    7.34103 Sig.  .0232
Intercept(S.E.)  -55.55854( 52.53619)  Slope(S.E.)  522.36729(200.92770)

This procedure was completed at 21:35:06
finish
[Next command's output on page   1
include 'plot1.dat'.
[*  Test:      Using PLOT to display data associated with a
[*             correlation study (Pearson's product-moment
[*             coefficient of correlation)
[*
```

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 719

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there is a correlation (alpha = .05) between number of games won (baseball) and team batting average. (American League teams from the 1986 season will serve as the example for this exercise).

Plot the association.

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252

```
[*
[*              Oakland                    76              .252
[*
[*              Chicago                    72              .247
[*
[*
[*  Ho:         There is no association between number of games won
[*              and team batting average (alpha = .05).
[*
[*  Note.       Use (a) to signify an alphabetical string when key-
[*              ing baseball teams.
[*
[   Answer:     Answer(s) can be found in plot1.lis.  Briefly,
[*
[*              Computed  r  = .600, a generally moderate positive
[*              association.
[*
[*                y |          *
[*                  |        *
[*                  |      *          Representation of a
[*                  |    *            positive correlation
[*                  |  *
[*                  |
[*                  |_____________
[*                                 x
[*
[*              Be sure to rename spss.lis to plot1.lis.
[
[DATA LIST /
[       Team      01-20 (a)
[       G_Won     22-23
[       TBA       25-28.
[
[VARIABLE LABELS
[       Team      "American League, 1986 Season"
[       G_Won     "Number of Games Won"
[       TBA       "Team Batting Average".
[
[BEGIN DATA.
[Cleveland              84 .284
[New_York               90 .271
[Boston                 95 .271
[Toronto                86 .269
[Texas                  87 .267
[Detroit                87 .263
[Minnesota              71 .261
[Baltimore              73 .258
[California             92 .255
[Milwaukee              77 .255
[Seattle                67 .253
[Kansas_City            76 .252
[Oakland                76 .252
[Chicago                72 .247
```

```
END DATA.
PLOT HSIZE = 36 / VSIZE = 14 / FORMAT = REGRESSION / PLOT = G_Won with TBA.
Next command's output on page   5
finish
```

Test: Using HISTOGRAM to display data associated with a correlation study (Pearson's product-moment coefficient of correlation)

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 719

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, determine if there is a correlation (alpha = .05) between number of games won (baseball) and team batting average. (American League teams from the 1986 season will serve as the example for this exercise).

Plot a histogram of number of games won (G_Won).

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
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Milwaukee	77	.255

Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Note. Use (a) to signify an alphabetical string when keying baseball teams.

Answer: Answer(s) can be found in plot2.lis. Briefly, a histogram of the data offers evidence of a "quasi-bell shaped curve." Remember, with low n it is difficult to obtain representation of a bell shaped curve.

The histogram of a bell shaped curve would appear as:

```
|X
|XX
|XXXX
|XXXXXX
|XXXXXXXX
|XXXXXXXXXX
|XXXXXXXXXXXX
|XXXXXXXXXXXXXX
|XXXXXXXXXXXXXXXX
|XXXXXXXXXXXXXXXXXX
|XXXXXXXXXXXXXXXX
|XXXXXXXXXXXXXX
|XXXXXXXXXXXX
|XXXXXXXXXX
|XXXXXXXX
|XXXXXXX
|XXXXX
|XX
|X
```

Be sure to rename spss.lis to plot2.lis.

```
DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.
```

```
VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
New_York             90 .271
Boston               95 .271
Toronto              86 .269
Texas                87 .267
Detroit              87 .263
Minnesota            71 .261
Baltimore            73 .258
California           92 .255
Milwaukee            77 .255
Seattle              67 .253
Kansas_City          76 .252
Oakland              76 .252
Chicago              72 .247
END DATA.
                              SPSS/PC+ Studentware                    11/26/89
include 'plot2.dat'.
*  Test:       Using HISTOGRAM to display data associated with
*              a correlation study (Pearson's product-moment
*              coefficient of correlation)
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
*                   California:  Dellen Publishing Company, 1988.
*                   ISBN 0-02-379260-4  Page 719
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine if
*              there is a correlation (alpha = .05) between number
*              of games won (baseball) and team batting average.
*              (American League teams from the 1986 season will
*              serve as the example for this exercise).
*
*              Plot a histogram of number of games won (G_Won).
*
*
*                                   Table 1
*
*                                Summary Data
*
*
*
*
```

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Note. Use (a) to signify an alphabetical string when keying baseball teams.

Answer: Answer(s) can be found in plot2.lis. Briefly, a histogram of the data offers evidence of a "quasi-bell shaped curve." Remember, with low n it is difficult to obtain representation of a bell shaped curve.

The histogram of a bell shaped curve would appear as:

```
|X
|XX
|XXXX
|XXXXXX
```

```
*               |XXXXXXXX
*               |XXXXXXXXXX
*               |XXXXXXXXXXX
*               |XXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXX
*               |XXXXXXXXXXXX
*               |XXXXXXXXXX
*               |XXXXXXXX
*               |XXXXXXX
*               |XXXXX
*               |XX
*               |X
*
*              Be sure to rename spss.lis to plot2.lis.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
END DATA.
     14 cases are written to the compressed active file.

This procedure was completed at 22:08:28
FREQUENCIES VARIABLES = G_Won / HISTOGRAM
MINIMUM (50)
MAXIMUM (100)
INCREMENT (5).

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to    890 Value Labels for each Variable.
```

Page 2 SPSS/PC+ Studentware 11/26/89

G_WON Number of Games Won

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	67	1	7.1	7.1	7.1
	71	1	7.1	7.1	14.3
	72	1	7.1	7.1	21.4

73	1	7.1	7.1	28.6
76	2	14.3	14.3	42.9
77	1	7.1	7.1	50.0
84	1	7.1	7.1	57.1
86	1	7.1	7.1	64.3
87	2	14.3	14.3	78.6
90	1	7.1	7.1	85.7
92	1	7.1	7.1	92.9
95	1	7.1	7.1	100.0
TOTAL	14	100.0	100.0	

Page 3 SPSS/PC+ Studentware 11/26/89

G_WON Number of Games Won

```
  Count   Midpoint
      0      52.50 |
      0      57.50 |
      0      62.50 |
      1      67.50 |\\\\\
      3      72.50 |\\\\\\\\\\\\\\
      3      77.50 |\\\\\\\\\\\\\\
      1      82.50 |\\\\\
      3      87.50 |\\\\\\\\\\\\\\
      2      92.50 |\\\\\\\\\
      1      97.50 |\\\\\
            I....+....I....+....I....+....I....+....I....+....I
            0         1         2         3         4         5
                      Histogram Frequency
```

Valid Cases 14 Missing Cases 0

This procedure was completed at 22:14:50

Page 4 SPSS/PC+ Studentware 11/26/89

```
finish
[Next command's output on page   1
include 'plot2.dat'.
[*  Test:      Using HISTOGRAM to display data associated with
[*             a correlation study (Pearson's product-moment
[*             coefficient of correlation)
[*
[*  Author:    Thomas W. MacFarland, Ed.D.
[*
[*  Source:    McClave, James T., and Frank H. Dietrich, II.
[*                  STATISTICS, 4th edition.  San Francisco,
[*                  California:  Dellen Publishing Company, 1988.
[*                  ISBN 0-02-379260-4  Page 719
[*
[*  Software:  SPSS/PC+ Studentware
[*
[*  Scenario:  Based on data provided in Table 1, determine if
```

there is a correlation (alpha = .05) between number of games won (baseball) and team batting average. (American League teams from the 1986 season will serve as the example for this exercise).

Plot a histogram of number of games won (G_Won).

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Note. Use (a) to signify an alphabetical string when key-

```
*               ing baseball teams.
*
*  Answer:      Answer(s) can be found in plot2.lis.  Briefly,
*               a histogram of the data offers evidence of a
*               "quasi-bell shaped curve."  Remember, with low
*               n it is difficult to obtain representation of
*               a bell shaped curve.
*
*               The histogram of a bell shaped curve would
*               appear as:
*
*               |X
*               |XX
*               |XXXX
*               |XXXXXX
*               |XXXXXXXX
*               |XXXXXXXXXX
*               |XXXXXXXXXXXX
*               |XXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXXXX
*               |XXXXXXXXXXXXXX
*               |XXXXXXXXXXXX
*               |XXXXXXXXXX
*               |XXXXXXXX
*               |XXXXXXX
*               |XXXXX
*               |XX
*               |X
*
*               Be sure to rename spss.lis to plot2.lis.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
New_York             90 .271
Boston               95 .271
Toronto              86 .269
Texas                87 .267
Detroit              87 .263
Minnesota            71 .261
Baltimore            73 .258
```

```
[California              92 .255
[Milwaukee               77 .255
[Seattle                 67 .253
[Kansas_City             76 .252
[Oakland                 76 .252
[Chicago                 72 .247
[END DATA.
FREQUENCIES VARIABLES = G_Won / HISTOGRAM
MINIMUM (50)
MAXIMUM (100)
INCREMENT (5).
[Next command's output on page   4
finish
```

Test: Simple linear regression

Author: Thomas W. MacFarland, Ed.D.

Source: McClave, James T., and Frank H. Dietrich, II. STATISTICS, 4th edition. San Francisco, California: Dellen Publishing Company, 1988. ISBN 0-02-379260-4 Page 694

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, develop a model describing the relationship between y (G_Won) and x (TBA). (American League teams from the 1986 season will serve as the example for this exercise).

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252

```
*              Oakland                    76              .252
*
*              Chicago                    72              .247
*
*
*  Ho:         There is no association between number of games won
*              and team batting average (alpha = .05).
*
*  Answer:     Answer(s) can be found in regress.lis.  Briefly,
*
*              ^
*              y = -55.56 + 522.37 x
*
*              Be sure to rename spss.lis to regress.lis.
*
*  Note:       Use (a) to signify an alphabetical string when key-
*              ing baseball teams.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
Cleveland            84 .284
New_York             90 .271
Boston               95 .271
Toronto              86 .269
Texas                87 .267
Detroit              87 .263
Minnesota            71 .261
Baltimore            73 .258
California           92 .255
Milwaukee            77 .255
Seattle              67 .253
Kansas_City          76 .252
Oakland              76 .252
Chicago              72 .247
END DATA.
                              SPSS/PC+ Studentware                    11/27/89
include 'regress.dat'.
*  Test:       Simple linear regression
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     McClave, James T., and Frank H. Dietrich, II.
*                   STATISTICS, 4th edition.  San Francisco,
```

California: Dellen Publishing Company, 1988.
ISBN 0-02-379260-4 Page 694

Software: SPSS/PC+ Studentware

Scenario: Based on data provided in Table 1, develop a model describing the relationship between y (G_Won) and x (TBA). (American League teams from the 1986 season will serve as the example for this exercise).

Table 1

Summary Data

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
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Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won

```
*              and team batting average (alpha = .05).
*
*  Answer:     Answer(s) can be found in regress.lis.  Briefly,
*
*              ^
*              y = -55.56 + 522.37 x
*
*              Be sure to rename spss.lis to regress.lis.
*
*  Note:       Use (a) to signify an alphabetical string when key-
*              ing baseball teams.

DATA LIST /
     Team      01-20 (a)
     G_Won     22-23
     TBA       25-28.

VARIABLE LABELS
     Team      "American League, 1986 Season"
     G_Won     "Number of Games Won"
     TBA       "Team Batting Average".

BEGIN DATA.
END DATA.
     14 cases are written to the compressed active file.

This procedure was completed at  2:25:59
REGRESSION VARIABLES = G_Won TBA / DEPENDENT = G_Won / METHOD = ENTER.
```

Page 2 SPSS/PC+ Studentware 11/27/89

* * * * M U L T I P L E R E G R E S S I O N * * * *

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. G_WON Number of Games Won

Beginning Block Number 1. Method: Enter

Page 3 SPSS/PC+ Studentware 11/27/89

* * * * M U L T I P L E R E G R E S S I O N * * * *

Equation Number 1 Dependent Variable.. G_WON Number of Games Won

Variable(s) Entered on Step Number
1.. TBA Team Batting Average

Multiple R .60025

```
R Square                .36030
Adjusted R Square       .30699
Standard Error         7.34103

Analysis of Variance
                    DF        Sum of Squares      Mean Square
Regression           1             364.23925        364.23925
Residual            12             646.68932         53.89078

F =       6.75884       Signif F =  .0232
```

```
        * * * *  M U L T I P L E  R E G R E S S I O N  * * * *

Equation Number 1    Dependent Variable..   G_WON   Number of Games Won

------------------ Variables in the Equation -----------------

Variable                B         SE B        Beta         T  Sig T

TBA            522.36729    200.92771      .60025     2.600  .0232
(Constant)     -55.55854     52.53619                -1.058  .3111


End Block Number   1   All requested variables entered.

This procedure was completed at  2:29:10
finish
[Next command's output on page   1
include 'regress.dat'.
[*  Test:       Simple linear regression
[*
[*  Author:     Thomas W. MacFarland, Ed.D.
[*
[*  Source:     McClave, James T., and Frank H. Dietrich, II.
[*                   STATISTICS, 4th edition.  San Francisco,
[*                   California:  Dellen Publishing Company, 1988.
[*                   ISBN 0-02-379260-4  Page 694
[*
[*  Software:   SPSS/PC+ Studentware
[*
[*  Scenario:   Based on data provided in Table 1, develop a model
[*              describing the relationship between y (G_Won) and
[*              x (TBA).  (American League teams from the 1986
[*              season will serve as the example for this exercise).
[*
[*
[*                                  Table 1
[*
[*                                Summary Data
```

Team	Number of Games Won	Team Batting Average
Cleveland	84	.284
New York	90	.271
Boston	95	.271
Toronto	86	.269
Texas	87	.267
Detroit	87	.263
Minnesota	71	.261
Baltimore	73	.258
California	92	.255
Milwaukee	77	.255
Seattle	67	.253
Kansas City	76	.252
Oakland	76	.252
Chicago	72	.247

Ho: There is no association between number of games won and team batting average (alpha = .05).

Answer: Answer(s) can be found in regress.lis. Briefly,

$\hat{y} = -55.56 + 522.37\ x$

Be sure to rename sp s.lis to regress.lis.

Note: Use (a) to signify an alphabetical string when keying baseball teams.

```
DATA LIST /
     Team      01-20 (a)
```

```
[     G_Won     22-23
[     TBA       25-28.
[
[VARIABLE LABELS
[     Team      "American League, 1986 Season"
[     G_Won     "Number of Games Won"
[     TBA       "Team Batting Average".
[
[BEGIN DATA.
[Cleveland              84 .284
[New_York               90 .271
[Boston                 95 .271
[Toronto                86 .269
[Texas                  87 .267
[Detroit                87 .263
[Minnesota              71 .261
[Baltimore              73 .258
[California             92 .255
[Milwaukee              77 .255
[Seattle                67 .253
[Kansas_City            76 .252
[Oakland                76 .252
[Chicago                72 .247
[END DATA.
REGRESSION VARIABLES = G_Won TBA / DEPENDENT = G_Won / METHOD = ENTER.
[Next command's output on page   5
finish
```

```
*  Test:       Using SELECT IF to calculate descriptive statistics
*              for parts of a data set
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     Personal notes
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine the
*              mean for subject Tom.
*
*              By using SELECT IF, do not include Test #1 in the
*              calculations.
*
*
*                                   Table 1
*
*                                Summary Data
*
*
*
*
*
*
*
*
*
*  Answer:     Answer(s) can be found in selectif.lis.  Briefly,
*
*              Mean for Tom (Test #2 to Test #5) = 84.00
*
*              Be sure to rename spss.lis to selectif.lis.
```

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	085	094

```
DATA LIST /
     Test_#       01
     Tom        03-05
     Bob        07-09
     Roy        11-13
     Sue        15-17
     Bea        19-21.

VARIABLE LABELS
```

```
     Test_#     "Test Number (of five)"
     Tom        "Thomas R. O'Callish"
     Bob        "Robert E. Lee, IV"
     Roy        "Leroy G. Anglesh"
     Sue        "Susan V. Douglas"
     Bea        "Beatrice H. Malcolm".

SELECT IF (Test_# > 1).

BEGIN DATA.
1 089 091 081 081 083
2 091 081 071 089 100
3 091 065 045 081 092
4 082 071 062 079 081
5 072 067 091 085 094
END DATA.
```

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```
include 'selectif.dat'.
*  Test:        Using SELECT IF to calculate descriptive statistics
*               for parts of a data set
*
*  Author:      Thomas W. MacFarland, Ed.D.
*
*  Source:      Personal notes
*
*  Software:    SPSS/PC+ Studentware
*
*  Scenario:    Based on data provided in Table 1, determine the
*               mean for subject Tom.
*
*               By using SELECT IF, do not include Test #1 in the
*               calculations.
```

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081

```
*                5          072       067       091       085       094
*
*
*  Answer:       Answer(s) can be found in selectif.lis.  Briefly,
*
*                Mean for Tom (Test #2 to Test #5) = 84.00
*
*                Be sure to rename spss.lis to selectif.lis.

DATA LIST /
     Test_#          01
     Tom          03-05
     Bob          07-09
     Roy          11-13
     Sue          15-17
     Bea          19-21.

VARIABLE LABELS
     Test_#       "Test Number (of five)"
     Tom          "Thomas R. O'Callish"
     Bob          "Robert E. Lee, IV"
     Roy          "Leroy G. Anglesh"
     Sue          "Susan V. Douglas"
     Bea          "Beatrice H. Malcolm".

SELECT IF (Test_# > 1).

BEGIN DATA.
END DATA.
      4 cases are written to the compressed active file.

This procedure was completed at  0:42:36
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to     890 Value Labels for each Variable.
```

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TOM Thomas R. O'Callish

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	72	1	25.0	25.0	25.0
	82	1	25.0	25.0	50.0
	91	2	50.0	50.0	100.0
	TOTAL	4	100.0	100.0	

Mean 84.000

Valid Cases 4 Missing Cases 0

This procedure was completed at 0:43:49

---

finish
[Next command's output on page 1
include 'selectif.dat'.
[* Test: Using SELECT IF to calculate descriptive statistics
[* for parts of a data set
[*
[* Author: Thomas W. MacFarland, Ed.D.
[*
[* Source: Personal notes
[*
[* Software: SPSS/PC+ Studentware
[*
[* Scenario: Based on data provided in Table 1, determine the
[* mean for subject Tom.
[*
[* By using SELECT IF, do not include Test #1 in the
[* calculations.

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	085	094

[* Answer: Answer(s) can be found in selectif.lis. Briefly,
[* Mean for Tom (Test #2 to Test #5) = 84.00
[*
[* Be sure to rename spss.lis to selectif.lis.

```
[
[DATA LIST /
[      Test_#        01
[      Tom         03-05
[      Bob         07-09
[      Roy         11-13
[      Sue         15-17
[      Bea         19-21.
[
[VARIABLE LABELS
[      Test_#     "Test Number (of five)"
[      Tom        "Thomas R. O'Callish"
[      Bob        "Robert E. Lee, IV"
[      Roy        "Leroy G. Anglesh"
[      Sue        "Susan V. Douglas"
[      Bea        "Beatrice H. Malcolm".
[
[SELECT IF (Test_# > 1).
[
[BEGIN DATA.
[1 089 091 081 081 083
[2 091 081 071 089 100
[3 091 065 045 081 092
[4 082 071 062 079 081
[5 072 067 091 085 094
[END DATA.
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.
[Next command's output on page   3
finish
```

```
*  Test:      Using COMPUTE to calculate descriptive statistics
*             that will be different than the original data set
*
*  Author:    Thomas W. MacFarland, Ed.D.
*
*  Source:    Personal notes
*
*  Software:  SPSS/PC+ Studentware
*
*  Scenario:  Based on data provided in Table 1, determine the
*             mean for subject Tom.
*
*             By using COMPUTE, each datum for Tom will be
*             increased by a value of "10."
```

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	085	094

```
*  Answer:    Answer(s) can be found in compute.lis.  Briefly,
*
*             Mean for Tom = 95.00
*
*             Be sure to rename spss.lis to compute.lis.

DATA LIST /
     Test_#       01
     Tom       03-05
     Bob       07-09
     Roy       11-13
     Sue       15-17
     Bea       19-21.

VARIABLE LABELS
```

```
     Test_#     "Test Number (of five)"
     Tom        "Thomas R. O'Callish"
     Bob        "Robert E. Lee, IV"
     Roy        "Leroy G. Anglesh"
     Sue        "Susan V. Douglas"
     Bea        "Beatrice H. Malcolm".

COMPUTE Tom = Tom + 10.

BEGIN DATA.
1 089 091 081 081 083
2 091 081 071 089 100
3 091 065 045 081 092
4 082 071 062 079 081
5 072 067 091 085 094
END DATA.
```

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```
include 'compute.dat'.
*  Test:       Using COMPUTE to calculate descriptive statistics
*              that will be different than the original data set
*
*  Author:     Thomas W. MacFarland, Ed.D.
*
*  Source:     Personal notes
*
*  Software:   SPSS/PC+ Studentware
*
*  Scenario:   Based on data provided in Table 1, determine the
*              mean for subject Tom.
*
*              By using COMPUTE, each datum for Tom will be
*              increased by a value of "10."
*
*
*                              Table 1
*
*                           Summary Data
*
*
*
*
*              Test #    Tom    Bob    Roy    Sue    Bea
*
*
*                1       089    091    081    081    083
*
*                2       091    081    071    089    100
*
*                3       091    065    045    081    092
*
*                4       082    071    062    079    081
*
```

```
*                5          072       067       091       085       094
*
*
*  Answer:       Answer(s) can be found in compute.lis.  Briefly,
*
*                Mean for Tom = 95.00
*
*                Be sure to rename spss.lis to compute.lis.

DATA LIST /
     Test_#          01
     Tom           03-05
     Bob           07-09
     Roy           11-13
     Sue           15-17
     Bea           19-21.

VARIABLE LABELS
     Test_#      "Test Number (of five)"
     Tom         "Thomas R. O'Callish"
     Bob         "Robert E. Lee, IV"
     Roy         "Leroy G. Anglesh"
     Sue         "Susan V. Douglas"
     Bea         "Beatrice H. Malcolm".

COMPUTE Tom = Tom + 10.

BEGIN DATA.
END DATA.
      5 cases are written to the compressed active file.

This procedure was completed at  0:55:40
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to     890 Value Labels for each Variable.
```

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TOM Thomas R. O'Callish

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	82	1	20.0	20.0	20.0
	92	1	20.0	20.0	40.0
	99	1	20.0	20.0	60.0
	101	2	40.0	40.0	100.0
	TOTAL	5	100.0	100.0	

```
Mean          95.000

Valid Cases       5      Missing Cases     0

This procedure was completed at  0:57:13
```

```
Page    3                    SPSS/PC+ Studentware                        11/27/89
finish
[Next command's output on page    1
include 'compute.dat'.
[*   Test:        Using COMPUTE to calculate descriptive statistics
[*                that will be different than the original data set
[*
[*   Author:      Thomas W. MacFarland, Ed.D.
[*
[*   Source:      Personal notes
[*
[*   Software:    SPSS/PC+ Studentware
[*
[*   Scenario:    Based on data provided in Table 1, determine the
[*                mean for subject Tom.
[*
[*                By using COMPUTE, each datum for Tom will be
[*                increased by a value of "10."
[*
[*
[*                            Table 1
[*
[*                          Summary Data
[*
```

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	C85	094

```
[*
[*   Answer:      Answer(s) can be found in compute.lis.  Briefly,
[*
[*                Mean for Tom = 95.00
[*
```

```
[*              Be sure to rename spss.lis to compute.lis.
[
[DATA LIST /
[       Test_#          01
[       Tom         03-05
[       Bob         07-09
[       Roy         11-13
[       Sue         15-17
[       Bea         19-21.
[
[VARIABLE LABELS
[       Test_#      "Test Number (of five)"
[       Tom         "Thomas R. O'Callish"
[       Bob         "Robert E. Lee, IV"
[       Roy         "Leroy G. Anglesh"
[       Sue         "Susan V. Douglas"
[       Bea         "Beatrice H. Malcolm".
[
[COMPUTE Tom = Tom + 10.
[
[BEGIN DATA.
[1 089 091 081 081 083
[2 091 081 071 089 100
[3 091 065 045 081 092
[4 082 071 062 079 081
[5 072 067 091 085 094
[END DATA.
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.
[Next command's output on page   3
finish
```

```
*   Test:        Using IF to calculate descriptive statistics that
*                will be different than the original data set
*
*   Author:      Thomas W. MacFarland, Ed.D.
*
*   Source:      Personal notes
*
*   Software:    SPSS/PC+ Studentware
*
*   Scenario:    Based on data provided in Table 1, determine the
*                mean for subject Tom.
*
*                By using IF, the overall mean for Tom will be
*                different than originally suggested.
*
*
*                                Table 1
*
*                             Summary Data
*
*
*
*
*                Test #     Tom     Bob     Roy     Sue     Bea
*
*
*                  1        089     091     081     081     083
*
*                  2        091     081     071     089     100
*
*                  3        091     065     045     081     092
*
*                  4        082     071     062     079     081
*
*                  5        072     067     091     085     094
*
*
*   Answer:      Answer(s) can be found in if.lis.  Briefly,
*
*                Mean for Tom = 87.20
*
*                Be sure to rename spss.lis to if.lis.

DATA LIST /
     Test_#      01
     Tom       03-05
     Bob       07-09
     Roy       11-13
     Sue       15-17
     Bea       19-21.

VARIABLE LABELS
```

```
Test_#    "Test Number (of five)"
Tom       "Thomas R. O'Callish"
Bob       "Robert E. Lee, IV"
Roy       "Leroy G. Anglesh"
Sue       "Susan V. Douglas"
Bea       "Beatrice H. Malcolm".

IF (Test_# = 1) Tom = 100.

BEGIN DATA.
1 089 091 081 081 083
2 091 081 071 089 100
3 091 065 045 081 092
4 082 071 062 079 081
5 072 067 091 085 094
END DATA.
```

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```
include 'if.dat'.
* Test:      Using IF to calculate descriptive statistics that
*            will be different than the original data set
*
* Author:    Thomas W. MacFarland, Ed.D.
*
* Source:    Personal notes
*
* Software:  SPSS/PC+ Studentware
*
* Scenario:  Based on data provided in Table 1, determine the
*            mean for subject Tom.
*
*            By using IF, the overall mean for Tom will be
*            different than originally suggested.
```

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081

```
*                5          072       067       091       085       094
*
*
*  Answer:       Answer(s) can be found in if.lis.  Briefly,
*
*                Mean for Tom = 87.20
*
*                Be sure to rename spss.lis to if.lis.

DATA LIST /
     Test_#          01
     Tom          03-05
     Bob          07-09
     Roy          11-13
     Sue          15-17
     Bea          19-21.

VARIABLE LABELS
     Test_#       "Test Number (of five)"
     Tom          "Thomas R. O'Callish"
     Bob          "Robert E. Lee, IV"
     Roy          "Leroy G. Anglesh"
     Sue          "Susan V. Douglas"
     Bea          "Beatrice H. Malcolm".

IF (Test_# = 1) Tom = 100.

BEGIN DATA.
END DATA.
      5 cases are written to the compressed active file.

This procedure was completed at  1:06:57
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to     890 Value Labels for each Variable.
```

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TOM Thomas R. O'Callish

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	72	1	20.0	20.0	20.0
	82	1	20.0	20.0	40.0
	91	2	40.0	40.0	80.0
	100	1	20.0	20.0	100.0
	TOTAL	5	100.0	100.0	

Mean 87.200

Valid Cases 5 Missing Cases 0

This procedure was completed at 1:08:48

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```
finish
[Next command's output on page   1
include 'if.dat'.
[*  Test:      Using IF to calculate descriptive statistics that
[*             will be different than the original data set
[*
[*  Author:    Thomas W. MacFarland, Ed.D.
[*
[*  Source:    Personal notes
[*
[*  Software:  SPSS/PC+ Studentware
[*
[*  Scenario:  Based on data provided in Table 1, determine the
[*             mean for subject Tom.
[*
[*             By using IF, the overall mean for Tom will be
[*             different than originally suggested.
```

Table 1

Summary Data

Test #	Tom	Bob	Roy	Sue	Bea
1	089	091	081	081	083
2	091	081	071	089	100
3	091	065	045	081	092
4	082	071	062	079	081
5	072	067	091	085	094

```
*  Answer:    Answer(s) can be found in if.lis.  Briefly,
*
*             Mean for Tom = 87.20
*
```

```
[*              Be sure to rename spss.lis to if.lis.
[
[DATA LIST /
[      Test_#        01
[      Tom         03-05
[      Bob         07-09
[      Roy         11-13
[      Sue         15-17
[      Bea         19-21.
[
[VARIABLE LABELS
[      Test_#     "Test Number (of five)"
[      Tom        "Thomas R. O'Callish"
[      Bob        "Robert E. Lee, IV"
[      Roy        "Leroy G. Anglesh"
[      Sue        "Susan V. Douglas"
[      Bea        "Beatrice H. Malcolm".
[
[IF (Test_# = 1) Tom = 100.
[
[BEGIN DATA.
[1 089 091 081 081 083
[2 091 081 071 089 100
[3 091 065 045 081 092
[4 082 071 062 079 081
[5 072 067 091 085 094
[END DATA.
FREQUENCIES VARIABLES = Tom / STATISTICS = MEAN.
[Next command's output on page   3
finish
```

```
*  Test:      Descriptive Statistics, Using Percentiles
*
*  Author:    Thomas W. MacFarland, Ed.D.
*
*  Source:    Personal notes
*
*  Software:  SPSS/PC+ Studentware
*
*  Scenario:  Based on data provided in Table 1, determine the
*             following percentiles for each student:
*
*             1.  25th percentile
*
*             2.  50th percentile
*
*             3.  75th percentile
*
*
*                                  Table 1
*
*                              Summary Data
*
*  ------------------------------------------------------------
*  |  Tom  |  Bob  |  Roy  |  Sue  |  Bea  |
*  ------------------------------------------------------------
*  |  089  |  091  |  081  |  081  |  083  |
*  |  091  |  081  |  071  |  089  |  100  |
*  |  091  |  065  |  045  |  081  |  092  |
*  |  082  |  071  |  062  |  079  |  081  |
*  |  072  |  067  |  091  |  085  |  094  |
*  ------------------------------------------------------------
*
*  Answer:    Answer(s) for each student can be found in pct.lis.
*
*             Be sure to rename spss.lis to pct.lis.

DATA LIST /
     Tom        01-03
     Bob        06-08
     Roy        11-13
     Sue        16-18
     Bea        21-23.

VARIABLE LABELS
     Tom        "Thomas R. O'Callish"
```

```
     Bob        "Robert E. Lee, IV"
     Roy        "Leroy G. Anglesh"
     Sue        "Susan V. Douglas"
     Bea        "Beatrice H. Malcolm".

BEGIN DATA.
089  091  081  081  083
091  081  071  089  100
091  065  045  081  092
082  071  062  079  081
072  067  091  085  094
END DATA.
```

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```
include 'pct.dat'.
*  Test:        Descriptive Statistics, Using Percentiles
*
*  Author:      Thomas W. MacFarland, Ed.D.
*
*  Source:      Personal notes
*
*  Software:    SPSS/PC+ Studentware
*
*  Scenario:    Based on data provided in Table 1, determine the
*               following percentiles for each student:
*
*               1.  25th percentile
*
*               2.  50th percentile
*
*               3.  75th percentile
*
*
*                               Table 1
*
*                            Summary Data
*
```

Tom	Bob	Roy	Sue	Bea
089	091	081	081	083
091	081	071	089	100
091	065	045	081	092
082	071	062	079	081
072	067	091	085	094

```
*
*  Answer:    Answer(s) for each student can be found in pct.lis.
*
*             Be sure to rename spss.lis to pct.lis.

DATA LIST /
     Tom        01-03
     Bob        06-08
     Roy        11-13
     Sue        16-18
     Bea        21-23.

VARIABLE LABELS
     Tom        "Thomas R. O'Callish"
     Bob        "Robert E. Lee, IV"
     Roy        "Leroy G. Anglesh"
     Sue        "Susan V. Douglas"
     Bea        "Beatrice H. Malcolm".

BEGIN DATA.
END DATA.
      5 cases are written to the compressed active file.

This procedure was completed at 22:57:51
FREQUENCIES VARIABLES = ALL / PERCENTILES = 25 50 75.

***** Memory allows a total of   7119 Values, accumulated across all Variables.
      There also may be up to    890 Value Labels for each Variable.
```

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TOM Thomas R. O'Callish

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	72	1	20.0	20.0	20.0
	82	1	20.0	20.0	40.0
	89	1	20.0	20.0	60.0
	91	2	40.0	40.0	100.0
	TOTAL	5	100.0	100.0	

Percentile	Value	Percentile	Value	Percentile	Value
25.00	77.000	50.00	89.000	75.00	91.000

Valid Cases 5 Missing Cases 0

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BOB Robert E. Lee, IV

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	65	1	20.0	20.0	20.0
	67	1	20.0	20.0	40.0
	71	1	20.0	20.0	60.0
	81	1	20.0	20.0	80.0
	91	1	20.0	20.0	100.0
	TOTAL	5	100.0	100.0	

Percentile	Value	Percentile	Value	Percentile	Value
25.00	66.000	50.00	71.000	75.00	86.000

Valid Cases 5 Missing Cases 0

ROY Leroy G. Anglesh

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	45	1	20.0	20.0	20.0
	62	1	20.0	20.0	40.0
	71	1	20.0	20.0	60.0
	81	1	20.0	20.0	80.0
	91	1	20.0	20.0	100.0
	TOTAL	5	100.0	100.0	

Percentile	Value	Percentile	Value	Percentile	Value
25.00	53.500	50.00	71.000	75.00	86.000

Valid Cases 5 Missing Cases 0

SUE Susan V. Douglas

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	79	1	20.0	20.0	20.0
	81	2	40.0	40.0	60.0
	85	1	20.0	20.0	80.0
	89	1	20.0	20.0	100.0

TOTAL	5	100.0	100.0

Percentile	Value	Percentile	Value	Percentile	Value
25.00	80.000	50.00	81.000	75.00	87.000

Valid Cases 5 Missing Cases 0

BEA Beatrice H. Malcolm

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	81	1	20.0	20.0	20.0
	83	1	20.0	20.0	40.0
	92	1	20.0	20.0	60.0
	94	1	20.0	20.0	80.0
	100	1	20.0	20.0	100.0
	TOTAL	5	100.0	100.0	

Percentile	Value	Percentile	Value	Percentile	Value
25.00	82.000	50.00	92.000	75.00	97.000

Valid Cases 5 Missing Cases 0

This procedure was completed at 23:00:51

```
finish
[Next command's output on page   1
include 'pct.dat'.
[*  Test:      Descriptive Statistics, Using Percentiles
[*
[*  Author:    Thomas W. MacFarland, Ed.D.
[*
[*  Source:    Personal notes
[*
[*  Software:  SPSS/PC+ Studentware
[*
[*  Scenario:  Based on data provided in Table 1, determine the
[*             following percentiles for each student:
[*
[*             1.  25th percentile
[*
[*             2.  50th percentile
[*
[*             3.  75th percentile
[*
```

[*
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[*

Table 1

Summary Data

Tom	Bob	Roy	Sue	Bea
089	091	081	081	083
091	081	071	089	100
091	065	045	081	092
082	071	062	079	081
072	067	091	085	094

[* Answer: Answer(s) for each student can be found in pct.lis.
[*
[* Be sure to rename spss.lis to pct.lis.

```
[
[DATA LIST /
[      Tom         01-03
[      Bob         06-08
[      Roy         11-13
[      Sue         16-18
[      Bea         21-23.
[
[VARIABLE LABELS
[      Tom         "Thomas R. O'Callish"
[      Bob         "Robert E. Lee, IV"
[      Roy         "Leroy G. Anglesh"
[      Sue         "Susan V. Douglas"
[      Bea         "Beatrice H. Malcolm".
[
[BEGIN DATA.
[089   091   081   081   083
[091   081   071   089   100
[091   065   045   081   092
[082   071   062   079   081
[072   067   091   085   094
[END DATA.
FREQUENCIES VARIABLES = ALL / PERCENTILES = 25 50 75.
[Next command's output on page   7
finish
```

```
DATA LIST /
     Test_#        01
     Tom         03-05
     Bob         07-09
     Roy         11-13
     Sue         15-17
     Bea         19-21.

VARIABLE LABELS
     Test_#      "Test Number (of five)"
     Tom         "Thomas R. O'Callish"
     Bob         "Robert E. Lee, IV"
     Roy         "Leroy G. Anglesh"
     Sue         "Susan V. Douglas"
     Bea         "Beatrice H. Malcolm".
```

Test #	Tom	Bob	Roy	Sue	Bea
1	89	91	81	81	83
2	91	81	71	89	100
3	91	65	45	81	92
4	82	71	62	79	81
5	72	67	91	85	94
Count	5	5	5	5	5
Mean	85.00	75.00	70.00	83.00	90.00