```
1            OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
NOTE: ODS statements in the SAS Studio environment may disable some output features.
69
70           *///*PROJECT 7*///*;
71
72           *Import school 2 final data*;
73           DATA s2f;
74               INFILE '/home/u63559709/sasuser.v94/Week 7/school 2 final.csv' DSD firstobs=2;
75               INPUT ClassID ChildID Gender $ ClassAge $ f1 f2 f3 f4;
76           RUN;

NOTE: The infile '/home/u63559709/sasuser.v94/Week 7/school 2 final.csv' is:
      Filename=/home/u63559709/sasuser.v94/Week 7/school 2 final.csv,
      Owner Name=u63559709,Group Name=oda,
      Access Permission=-rw-r--r--,
      Last Modified=12Oct2023:21:35:34,
      File Size (bytes)=3348

NOTE: 87 records were read from the infile '/home/u63559709/sasuser.v94/Week 7/school 2 final.csv'.
      The minimum record length was 35.
      The maximum record length was 37.
NOTE: The data set WORK.S2F has 87 observations and 8 variables.
NOTE: DATA statement used (Total process time):
      real time            0.00 seconds
      user cpu time        0.00 seconds
      system cpu time      0.00 seconds
      memory               937.15k
      OS Memory            26284.00k
      Timestamp            10/18/2023 02:55:39 AM
      Step Count                      319  Switch Count  2
      Page Faults                     0
      Page Reclaims                   94
      Page Swaps                      0
      Voluntary Context Switches      15
      Involuntary Context Switches    1
      Block Input Operations          0
      Block Output Operations         264


77
78           ***Problem 1***;
79
80           *Part 1*;
81           proc univariate data = s2f;
82               var f1;
83           run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time            0.03 seconds
      user cpu time        0.04 seconds
      system cpu time      0.01 seconds
      memory               1813.53k
      OS Memory            26284.00k
      Timestamp            10/18/2023 02:55:39 AM
      Step Count                      320  Switch Count  0
      Page Faults                     0
      Page Reclaims                   64
      Page Swaps                      0
      Voluntary Context Switches      0
      Involuntary Context Switches    0
      Block Input Operations          0
      Block Output Operations         16


84
85           proc univariate data = s2f;
86               var f2;
87           run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
```

```
        real time            0.03 seconds
        user cpu time        0.03 seconds
        system cpu time      0.00 seconds
        memory               946.59k
        OS Memory            26284.00k
        Timestamp            10/18/2023 02:55:39 AM
        Step Count                       321  Switch Count  0
        Page Faults                      0
        Page Reclaims                    56
        Page Swaps                       0
        Voluntary Context Switches       0
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          0


88
89          proc univariate data = s2f;
90              var f3;
91          run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
        real time            0.03 seconds
        user cpu time        0.03 seconds
        system cpu time      0.00 seconds
        memory               902.71k
        OS Memory            26284.00k
        Timestamp            10/18/2023 02:55:39 AM
        Step Count                       322  Switch Count  0
        Page Faults                      0
        Page Reclaims                    55
        Page Swaps                       0
        Voluntary Context Switches       0
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          16


92
93          proc univariate data = s2f;
94              var f4;
95          run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
        real time            0.03 seconds
        user cpu time        0.04 seconds
        system cpu time      0.00 seconds
        memory               891.75k
        OS Memory            26284.00k
        Timestamp            10/18/2023 02:55:39 AM
        Step Count                       323  Switch Count  0
        Page Faults                      0
        Page Reclaims                    55
        Page Swaps                       0
        Voluntary Context Switches       0
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          24


96
97          *The variables that are normally distributed are f1, f3, and f4*;
98          *The variables that are right skewed are f2*;
99
100         *Part 2*;
101         ODS SELECT PLOTS;
102         proc univariate data=s2f PLOT;
103             var f3;
104         run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
        real time            0.10 seconds
```

```
        user cpu time         0.05 seconds
        system cpu time       0.00 seconds
        memory                9735.18k
        OS Memory             33632.00k
        Timestamp             10/18/2023 02:55:40 AM
        Step Count                       324  Switch Count  0
        Page Faults                      0
        Page Reclaims                    1952
        Page Swaps                       0
        Voluntary Context Switches       220
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          496


105
106         *Part 3*;
107         DATA s2f_updated;
108             SET s2f;
109             difference = f4 - f2;
110         RUN;

NOTE: There were 87 observations read from the data set WORK.S2F.
NOTE: The data set WORK.S2F_UPDATED has 87 observations and 9 variables.
NOTE: DATA statement used (Total process time):
        real time             0.00 seconds
        user cpu time         0.00 seconds
        system cpu time       0.00 seconds
        memory                957.90k
        OS Memory             32688.00k
        Timestamp             10/18/2023 02:55:40 AM
        Step Count                       325  Switch Count  2
        Page Faults                      0
        Page Reclaims                    142
        Page Swaps                       0
        Voluntary Context Switches       15
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          264


111
112         ods graphics on;
113         proc univariate data=s2f_updated;
114             var difference;
115             histogram difference;
116             qqplot difference / normal(mu=est sigma=est);
117         RUN;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
        real time             0.16 seconds
        user cpu time         0.10 seconds
        system cpu time       0.01 seconds
        memory                11741.87k
        OS Memory             42512.00k
        Timestamp             10/18/2023 02:55:40 AM
        Step Count                       326  Switch Count  0
        Page Faults                      0
        Page Reclaims                    3243
        Page Swaps                       0
        Voluntary Context Switches       244
        Involuntary Context Switches     0
        Block Input Operations           0
        Block Output Operations          472


118
119         proc sgplot data=s2f_updated;
120             vbox difference;
121         RUN;

NOTE: PROCEDURE SGPLOT used (Total process time):
```

```
      real time             0.06 seconds
      user cpu time         0.02 seconds
      system cpu time       0.00 seconds
      memory                1871.65k
      OS Memory             33332.00k
      Timestamp             10/18/2023 02:55:40 AM
      Step Count                        327  Switch Count  1
      Page Faults                       0
      Page Reclaims                     294
      Page Swaps                        0
      Voluntary Context Switches        164
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           384

NOTE: There were 87 observations read from the data set WORK.S2F_UPDATED.

122        ods graphics off;
123
124        *We would reject the null hypothesis and conclude that the mean
125        of the variable 'difference' does not statistically equal to 0
126        due to the p-values all being under .05.*;
127
128        *Part 4*;
129        proc sort data=s2f_updated;
130            by Gender;
131        run;

NOTE: There were 87 observations read from the data set WORK.S2F_UPDATED.
NOTE: The data set WORK.S2F_UPDATED has 87 observations and 9 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time             0.00 seconds
      user cpu time         0.00 seconds
      system cpu time       0.00 seconds
      memory                928.00k
      OS Memory             32688.00k
      Timestamp             10/18/2023 02:55:40 AM
      Step Count                        328  Switch Count  2
      Page Faults                       0
      Page Reclaims                     115
      Page Swaps                        0
      Voluntary Context Switches        12
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


132
133        proc univariate data=s2f_updated;
134            var difference;
135            by Gender;
136        run;

NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time             0.06 seconds
      user cpu time         0.06 seconds
      system cpu time       0.00 seconds
      memory                1111.50k
      OS Memory             32428.00k
      Timestamp             10/18/2023 02:55:40 AM
      Step Count                        329  Switch Count  0
      Page Faults                       0
      Page Reclaims                     58
      Page Swaps                        0
      Voluntary Context Switches        1
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           32


137
138        *Part 5*;
```

```
139        ODS TRACE ON;
140        proc univariate data=s2f_updated;
141            var difference;
142            output out=percentiles pctlpre=P_ pctlpts=5 to 100 by 5;
143        run;
```

Output Added:

Name: Moments
Label: Moments
Template: base.univariate.Moments
Path: Univariate.difference.Moments

Output Added:

Name: BasicMeasures
Label: Basic Measures of Location and Variability
Template: base.univariate.Measures
Path: Univariate.difference.BasicMeasures

Output Added:

Name: TestsForLocation
Label: Tests For Location
Template: base.univariate.Location
Path: Univariate.difference.TestsForLocation

Output Added:

Name: Quantiles
Label: Quantiles
Template: base.univariate.Quantiles
Path: Univariate.difference.Quantiles

Output Added:

Name: ExtremeObs
Label: Extreme Observations
Template: base.univariate.ExtObs
Path: Univariate.difference.ExtremeObs

NOTE: The data set WORK.PERCENTILES has 1 observations and 20 variables.
NOTE: PROCEDURE UNIVARIATE used (Total process time):
      real time   0.03 seconds
      user cpu time   0.04 seconds
      system cpu time   0.00 seconds
      memory   1206.50k
      OS Memory   32688.00k
      Timestamp   10/18/2023 02:55:40 AM
      Step Count   330 Switch Count 2
      Page Faults   0
      Page Reclaims   123
      Page Swaps   0
      Voluntary Context Switches   14
      Involuntary Context Switches   0
      Block Input Operations   0
      Block Output Operations   280

144   ODS TRACE OFF;
145
146
147   ods excel file="/home/u63559709/sasuser.v94/Week 7/percentiles.xlsx";
148   proc print data=work.percentiles;
149   run;

NOTE: There were 1 observations read from the data set WORK.PERCENTILES.
```

```
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.02 seconds
      user cpu time       0.02 seconds
      system cpu time     0.00 seconds
      memory              2175.31k
      OS Memory           39120.00k
      Timestamp           10/18/2023 02:55:40 AM
      Step Count                     331  Switch Count  0
      Page Faults                    0
      Page Reclaims                  457
      Page Swaps                     0
      Voluntary Context Switches     1
      Involuntary Context Switches   0
      Block Input Operations         0
      Block Output Operations        16


150        ods excel close;
NOTE: Writing EXCEL file: /home/u63559709/sasuser.v94/Week 7/percentiles.xlsx
151
152        ***Problem 2***;
153        *Part 1*;
154        data allSections;
155            length Section $ 1;
156            set sectiona (in=a) sectionb (in=b);
157            if a then Section = 'A';
158            else if b then Section = 'B';
159        run;

NOTE: There were 5 observations read from the data set WORK.SECTIONA.
NOTE: There were 5 observations read from the data set WORK.SECTIONB.
NOTE: The data set WORK.ALLSECTIONS has 10 observations and 2 variables.
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              1290.25k
      OS Memory           33204.00k
      Timestamp           10/18/2023 02:55:40 AM
      Step Count                     332  Switch Count  2
      Page Faults                    0
      Page Reclaims                  163
      Page Swaps                     0
      Voluntary Context Switches     12
      Involuntary Context Switches   0
      Block Input Operations         0
      Block Output Operations        264


160
161        proc ttest data=allSections;
162            class Section;
163            var score;
164        run;

NOTE: PROCEDURE TTEST used (Total process time):
      real time           0.03 seconds
      user cpu time       0.03 seconds
      system cpu time     0.00 seconds
      memory              1268.53k
      OS Memory           32684.00k
      Timestamp           10/18/2023 02:55:40 AM
      Step Count                     333  Switch Count  0
      Page Faults                    0
      Page Reclaims                  54
      Page Swaps                     0
      Voluntary Context Switches     0
      Involuntary Context Switches   0
      Block Input Operations         0
      Block Output Operations        0
```

```
165
166        *I disagree with the professor, Section A did not do statistically better than section B on average.
167        Although the mean score for Section A is higher than that for Section B, the difference is not
168        statistically significant based on the t-test results. The p-values are both over .3 and our
169        T-value is positive.*;
170
171        *Part 2*;
172        data BloodPressure;
173            input Test $ Pressure @@;
174            datalines;

NOTE: SAS went to a new line when INPUT statement reached past the end of a line.
NOTE: The data set WORK.BLOODPRESSURE has 12 observations and 2 variables.
NOTE: DATA statement used (Total process time):
      real time               0.00 seconds
      user cpu time           0.00 seconds
      system cpu time         0.00 seconds
      memory                  677.09k
      OS Memory               32684.00k
      Timestamp               10/18/2023 02:55:40 AM
      Step Count                        334  Switch Count  2
      Page Faults                       0
      Page Reclaims                     91
      Page Swaps                        0
      Voluntary Context Switches        14
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


177        ;
178
179        proc ttest;
180            class Test;
181            var Pressure;
182        run;

NOTE: PROCEDURE TTEST used (Total process time):
      real time               0.03 seconds
      user cpu time           0.02 seconds
      system cpu time         0.00 seconds
      memory                  987.53k
      OS Memory               32684.00k
      Timestamp               10/18/2023 02:55:40 AM
      Step Count                        335  Switch Count  0
      Page Faults                       0
      Page Reclaims                     54
      Page Swaps                        0
      Voluntary Context Switches        1
      Involuntary Context Switches      1
      Block Input Operations            0
      Block Output Operations           16


183
184        *The data does not provide enough evidence to state the mean blood pressure decreased
185        after training. The p-value is over .38 for both pooled and Satterthwaite methods which is well
186        above our alpha of .05. The T-value is negative which would be evidence but we must none the less
187        we would fail to reject the null hypothesis.*;
188
189        ***Problem 3***;
190        DATA Shows;
191            INPUT Show $ Gender $ Count;
192            DATALINES;

NOTE: The data set WORK.SHOWS has 6 observations and 3 variables.
NOTE: DATA statement used (Total process time):
      real time               0.00 seconds
      user cpu time           0.00 seconds
      system cpu time         0.00 seconds
      memory                  679.09k
      OS Memory               32684.00k
```

```
        Timestamp              10/18/2023 02:55:40 AM
        Step Count                        336  Switch Count  2
        Page Faults                       0
        Page Reclaims                     91
        Page Swaps                        0
        Voluntary Context Switches        16
        Involuntary Context Switches      0
        Block Input Operations            0
        Block Output Operations           264


199          ;
200          RUN;
201
202          PROC FREQ DATA=Shows;
203              TABLE Show * Gender/ CHISQ  EXPECT NOCOL NOROW NOPERCENT;
204              WEIGHT Count;
205          RUN;

NOTE: There were 6 observations read from the data set WORK.SHOWS.
NOTE: PROCEDURE FREQ used (Total process time):
        real time             0.02 seconds
        user cpu time         0.02 seconds
        system cpu time       0.00 seconds
        memory                1232.34k
        OS Memory             33204.00k
        Timestamp             10/18/2023 02:55:40 AM
        Step Count                        337  Switch Count  4
        Page Faults                       0
        Page Reclaims                     190
        Page Swaps                        0
        Voluntary Context Switches        24
        Involuntary Context Switches      0
        Block Input Operations            0
        Block Output Operations           544


206
207          *Based on the chi-square test results, there is a statistically significant difference between
208          boys' and girls' preferences for these TV programs. The p-value is less than .0001 meaning we
209          can reject the null hypothesis. Cramers V of .2538 suggests a moderate relationship between gender and
210          choice of TV program as well.*;
211
212          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
222
```