```
1          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
NOTE: ODS statements in the SAS Studio environment may disable some output features.
69
70         /* 1.) Add a header comment section to the beginning of a new program in your SAS session.  */
71         /* Be sure to include a comment line above each section of the program that identifies the  */
72         /* associated assignment step and a brief description of what the section is doing. Include  */
73         /* housekeeping statements to clear titles and footnotes and suppress the printing of procedure titles. */
74
75         /*****************************************************************************/
76         /* Program Name: STAT 604 HW#12   */
77         /* Date Created: 11/10/2021   */
78         /* Author: Jack Rodoni   */
79         /* Purpose: STAT 604 HW#12   */
80         /* Date Modified: 11/16/2021    */
81         /* Location: /home/u59649056/Homeworks/JRodoni_Homework12.sas   */
82         /*****************************************************************************/
83
84         TITLE;
85         FOOTNOTE;
86         ods noproctitle;
87
88
89         /* 2.) Assign a libref to the mylib folder containing your permanent data sets.  Create a fileref to the pdf file  */
90         /*     for output.  */
91
92         libname mylib "/home/u59649056/Homeworks/mylib";
NOTE: Libref MYLIB refers to the same physical library as _TEMP0.
NOTE: Libref MYLIB was successfully assigned as follows:
      Engine:        V9
      Physical Name: /home/u59649056/Homeworks/mylib
93         filename HW12pdf "/home/u59649056/Homeworks/mylib/JRodoni_HW12_Output.pdf";
94
95
96         /* 3.) Open the PDF destination to receive your output. */
97
98         ods pdf file = HW12pdf;
NOTE: Writing ODS PDF output to DISK destination "HW12PDF", printer "PDF".
99
100        /* 4.) Create a temporary custom format that can be applied to any of the columns containing the number of jobs.   */
101        /*     All values less than 10 will be displayed as 'Very Low'.  Values between 10 and 100 inclusive display
101      ! 'Low'.   */
102        /*     Values above 100 through 200 are 'Medium'.  Values above 200 through 500 are 'Medium High'.   */
103        /*     Values above 500 through 1000 are'High' and all values above 1000 are 'Very High'. */
104
105        proc format;
106        value hrange low-<10 = 'Very Low'
107         10-100 = 'Low'
108         100<-200 = 'Medium'
109         200<-500 = 'Medium High'
110         500<-1000 = 'High'
111         1000<-high = 'Very High';
NOTE: Format HRANGE has been output.
112        run;

NOTE: PROCEDURE FORMAT used (Total process time):
      real time           0.01 seconds
      user cpu time       0.01 seconds
      system cpu time     0.01 seconds
      memory              295.43k
      OS Memory           27812.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        29  Switch Count  2
      Page Faults                       0
      Page Reclaims                     86
      Page Swaps                        0
      Voluntary Context Switches        15
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           64



113
114        /* 5.) Write a single SAS step that will use the "Jobs" data set from the previous assignment as input  */
115        /* and create a temporary data set with the following modifications: */
116
117        data Jobs2018;
118        set mylib.jobs2018;
NOTE: Data file MYLIB.JOBS2018.DATA is in a format that is native to another host, or the file encoding does not match the session
      encoding. Cross Environment Data Access will be used, which might require additional CPU resources and might reduce
      performance.
```

```
119
120         /* (a) Without creating a new variable, recalculate the value in the variable containing the  */
121         /* 2017 Jobs total by subtracting the Aug_2017 value from the existing value. Use one of  */
122         /* the numeric functions to ensure that a missing August value does not cause the total to  */
123         /* be missing. (Hint: You can cause “subtraction” to occur by making one of your  */
124         /* arguments to the function negative.) */
125
126         TOTAL_2017 = sum(Total_2017,-Aug_2017);
127
128         /* (b) Without creating a new variable, change the Industry values to proper case. */
129
130         Industry = propcase(Industry);
131
132         /* (c) Since words like “And” should not be capitalized, replace them with “and” in the  */
133         /* Industry variable. */
134
135         Industry = tranwrd(Industry, 'And ','and ');
136         run;

NOTE: There were 420 observations read from the data set MYLIB.JOBS2018.
NOTE: The data set WORK.JOBS2018 has 420 observations and 19 variables.
NOTE: DATA statement used (Total process time):
      real time           0.01 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              1231.96k
      OS Memory           28584.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        30  Switch Count  2
      Page Faults                       0
      Page Reclaims                     263
      Page Swaps                        0
      Voluntary Context Switches        17
      Involuntary Context Switches      0
      Block Input Operations            128
      Block Output Operations           264


137
138         /* 6.) Without creating a new data set, reorder the rows in the new temporary data set by state and  */
139         /*    industry to accommodate the reports in the next two steps. */
140
141         proc sort data = work.Jobs2018;
142         by State Industry;
143         run;

NOTE: There were 420 observations read from the data set WORK.JOBS2018.
NOTE: The data set WORK.JOBS2018 has 420 observations and 19 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time           0.00 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
      memory              929.53k
      OS Memory           28844.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        31  Switch Count  2
      Page Faults                       0
      Page Reclaims                     204
      Page Swaps                        0
      Voluntary Context Switches        9
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


144
145
146         /* 7.) Produce a report listing the categories based on the “August Average” column by applying your  */
147         /* custom format to that column. The first few rows of the report are shown below. Your output  */
148         /* must match this sample. Use statements, proc options, temporary labels and temporary  */
149         /* formats as needed to accomplish this purpose. Note: The state column is used in place of the  */
150         /* default OBS column to identify records in the report. */
151
152         /* See Lecture Slides 10, pg 9 for ID and Var statements*/
153         /* See Lecture Slides 10 pg 57 for Label */
154         /* See Lecture Slides 10, pg 67 for format */
155         /* See Lecture Slides 10, pg 59 for split*/
156
157         title "Jobs Analysis by August Categories";
158         proc print data = work.Jobs2018 label split='*';
159         format Avg_Aug hrange.;
160         id State;
```

```
161         var Industry Avg_Aug;
162         label Avg_Aug = 'August*Average*Jobs'
163           State = '**State'
164           Industry = '**Industry';
165         run;

NOTE: There were 420 observations read from the data set WORK.JOBS2018.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.37 seconds
      user cpu time       0.38 seconds
      system cpu time     0.00 seconds
      memory              2612.78k
      OS Memory           30120.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        32  Switch Count  1
      Page Faults                       0
      Page Reclaims                     776
      Page Swaps                        0
      Voluntary Context Switches        4
      Involuntary Context Switches      2
      Block Input Operations            0
      Block Output Operations           184


166
167
168         /* 8.) Produce a report of jobs summaries from the midwestern states of 'Texas', 'Oklahoma', 'Kansas', */
169         /* 'Nebraska', 'South Dakota', and 'North Dakota' based on the values in the Total 2017 and Total  */
170         /* 2018 columns. The first table of the report are shown below. Your output, including titles, must  */
171         /* match this sample. Use statements, proc options, temporary labels and temporary formats as  */
172         /* needed to accomplish this purpose. Note: The var statement can be used without any variables  */
173         /* to exclude unwanted columns from appearing in the report. State and Industry are used to  */
174         /* replace the OBS column for identifying rows. */
175
176         /* See Lecture Slides 7 pg 41 for format */
177         /* See Lecture Slides 10 and 11 for by, page by and Sum*/
178
179
180
181         title1 "Midwest States Jobs Summary";
182         title2 "Thousands of Jobs";
183
184         proc print data=work.Jobs2018 label split='*';
185         where State in ('Texas','Oklahoma','Kansas','Nebraska','South Dakota','North Dakota');
186         format Total_2017 Total_2018 comma7.;
187         id State Industry;
188         var Total_2017 Total_2018;
189         by State;
190         sum Total_2017 Total_2018;
191         pageby State;
192         label Total_2017 = 'Sep. - Dec.*2017'
193           Total_2018 = 'Jan. - Aug.*2018'
194           Industry = '*Industry'
195           State = '*State';
196         run;

NOTE: There were 48 observations read from the data set WORK.JOBS2018.
      WHERE State in ('Kansas', 'Nebraska', 'North Dakota', 'Oklahoma', 'South Dakota', 'Texas');
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.09 seconds
      user cpu time       0.10 seconds
      system cpu time     0.00 seconds
      memory              1147.75k
      OS Memory           30892.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        33  Switch Count  1
      Page Faults                       0
      Page Reclaims                     278
      Page Swaps                        0
      Voluntary Context Switches        6
      Involuntary Context Switches      1
      Block Input Operations            0
      Block Output Operations           40


197
198
199
200         /* 9.) In a single PROC step, create a copy of the temporary data set created earlier in the assignment, */
201         /* reordered by the descending values of Aug_2018. The copy will also be a temporary data set. */
202
203         /* See lecture Slides 10, pg 44 */
```

```
204
205         proc sort data=work.Jobs2018
206           out = work.Jobs2018Sort;
207         by descending Aug_2018;
208         run;

NOTE: There were 420 observations read from the data set WORK.JOBS2018.
NOTE: The data set WORK.JOBS2018SORT has 420 observations and 19 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time           0.00 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
      memory              1197.84k
      OS Memory           31152.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        34  Switch Count  2
      Page Faults                       0
      Page Reclaims                     128
      Page Swaps                        0
      Voluntary Context Switches        12
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           272


209
210         /* 10.) Write a single PROC step that will list and report the descriptor portion of all data sets in the  */
211         /* WORK library. Supply an appropriate title.  */
212
213         proc contents DATA=work._All_ NODS;
214         title1 "Work Datasets Descriptor Portion";
215         RUN;

NOTE: PROCEDURE CONTENTS used (Total process time):
      real time           0.04 seconds
      user cpu time       0.04 seconds
      system cpu time     0.00 seconds
      memory              885.46k
      OS Memory           30632.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        35  Switch Count  1
      Page Faults                       0
      Page Reclaims                     251
      Page Swaps                        0
      Voluntary Context Switches        12
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           32


216
217
218         /* 11.) Use the last data set created to print a “Top 10” list of the industries and states with the highest  */
219         /* number of jobs in August 2018. Suppress the printing of observation numbers. Include only the  */
220         /* Aug_2018, Industry, and State columns in that order. Supply an appropriate first title and use  */
221         /* “Thousands of Jobs” as the second title line. Give Aug_2018 a label of “August 2018  */
222         /* Employment” and show the values with a comma separator. */
223
224         title1 "Top 10 August Job Numbers";
225         title2 "Thousands of Jobs";
226         proc print data = work.jobs2018Sort (obs = 10) noobs label;
227         format Aug_2018 comma7.;
228         var Aug_2018 Industry State;
229         label Aug_2018 = 'August 2018 Employment';
230         run;

NOTE: There were 10 observations read from the data set WORK.JOBS2018SORT.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.02 seconds
      user cpu time       0.03 seconds
      system cpu time     0.00 seconds
      memory              629.68k
      OS Memory           30888.00k
      Timestamp           11/16/2021 09:19:14 PM
      Step Count                        36  Switch Count  0
      Page Faults                       0
      Page Reclaims                     69
      Page Swaps                        0
      Voluntary Context Switches        1
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           8
```

```
231
232
233         /* 12.) Close the PDF destination. */
234
235         ods pdf close;
NOTE: ODS PDF printed 20 pages to /home/u59649056/Homeworks/mylib/JRodoni_HW12_Output.pdf.
236
237         OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
247
```