```
/*************************************************************************************/
/* Program Name: DSmith_HW14_prog.sas                                                */
/* Date Created: 4/26/2023                                                           */
/* Author: Dustin Smith                                                              */
/* Purpose: To complete Homework 15 of stats 604.                                    */
/*                                                                                   */
/* Inputs: hotheight.sas  all of which are found here "/home/u63307645/STAT_604_Folder/mylib"
   Outputs:DSmith_HW15_output.pdf located at "/home/u63307645/STAT_604_Folder/STAT_604_Howework/DSmith_HW14_output.pdf"
/*                                                                                   */
/*                                                                                */
/*************************************************************************************/

title;
footnote;
ods noproctitle;

/*2-3 Create file and librefs and open a pdf for reading the file to. */
libname mylib "/home/u63307645/STAT_604_Folder/mylib";
filename output "/home/u63307645/STAT_604_Folder/STAT_604_Howework/DSmith_HW15_output.pdf";
ods pdf file=output;

/*4 Create a format called Howhigh*/
proc format;
    value howhigh
    1000<-High = 'Very High'
    500<-1000 = 'High'
    175<-500 = 'Moderate'
    85<-175 = 'Low'
    OTHER = 'Very Low';
    select howhigh;
run;


/*5 Transpose the hothigh.sas dataset  */
proc transpose data=mylib.hotheight out=work.widehotheight prefix=_;
    where missing(TFMAX22) = 0;
    var TFMAX22;
    ID day;
    by STATION NAME ELEVATION;
run;

/*This helped me see what happened.*/
/* proc print data=work.widehotheight; */
/* run; */

/*6 Create a new ratio variable*/
data work.modwide;
    set work.widehotheight(rename=(ELEVATION=drop1));
    drop drop1;
    ELEVATION = input(drop1,5.);
    Ratio = _31/_1;
    format Ratio 4.2;
    label Ratio = "Last/First day of the Month";
run;

/*7 Print the descriptor portion*/
title "Descrtiptor Portion of Modified Wide Data set";
proc contents data=work.modwide varnum;
run;

/*8 Use the Freq Step*/
title "Frequency of each Elevation";
proc freq data=work.modwide nlevels order=freq;
    tables elevation / nocum nopercent nocol norow;
run;

/*9 Create a frequency table of the Elevation types in Texas*/
title "Frequency of the Elevation types in Texas";
proc freq data=work.modwide;
    tables ELEVATION / nocum nocol norow;
    format ELEVATION howhigh.;
run;

/*10 Use the proc means*/
title "Mean Ratio of Last to First Day's heat by elevation class";
proc means data=work.modwide;
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78      var Ratio;
79      class elevation;
80      format elevation howhigh.;
81  run;
82
83  /*11 More Means steps*/
84  title1 "Mean of Temperature per day";
85  title2 "From a wide data set";
86  proc means data=work.modwide min median mean max nonobs;
87      var _1-_31;
88      class elevation;
89      format elevation howhigh.;
90  run;
91
92  /*12 Use means on the hotheight data set*/
93  /*For some reason my elevation is in the char type. I needed the data step to fix that.*/
94  data mylib.hotheight;
95      set mylib.hotheight(rename=(ELEVATION=drop1));
96      drop drop1;
97      ELEVATION=input(drop1,5.);
98  run;
99
100 title1 "Mean of Temperature per day";
101 title2 "From a narrow data set";
102 title3 "Means Procedure";
103 proc means data=mylib.hotheight min median mean max nonobs;
104     var TFMAX22;
105     class day elevation; /*I do not know what order Prof. K. preferred, but I liked this one better.*/
106     format elevation howhigh.;
107 run;
108
109 /*13 Use the proc tabulate*/
110 title1 "Five number summary of the HotHeight data";
111 title2 "From a narrow data set";
112 title3 "Tabulate Procedure";
113 proc tabulate data=mylib.hotheight;
114     class Elevation day;
115     var TFMAX22;
116     table Elevation*day all, TFMAX22*(min median mean max);
117     format elevation howhigh.;
118 run;
119
120 /*14 Use the proc Univariate to show the extreme values of hotheight*/
121 title1 "Extreme temperatures";
122 title2 "From the July 2022 data";
123 proc univariate data=mylib.hotheight;
124     var TFMAX22;
125 run;
126
127 /*15 Print the extreme days, I completed this twice for each value in the extreme list*/
128 title "Second hottest recordings in July 2022";
129 proc print data=mylib.hotheight noobs;
130     where TFMAX22=114;
131     var Station name elevation day TFMAX21 TFMAX22;
132 run;
133
134 title "Second hottest recordings in July 2022";
135 proc print data=mylib.hotheight noobs;
136     where TFMAX22=115;
137     var Station name elevation day TFMAX21 TFMAX22;
138 run;
139 /*Close the pdf*/
140 ods pdf close;
141
142 /*****Questions*****/
143 /*A)  There were 10444 observations read into the transpose step, and 352 read out.
144
145 B) My script found 311 elevation levels in Texas.
146
147 C) I am not certain I interpreted part 8 correctly. I found 5 elevations with the highest frequency of 3.
148     They are 1.5, 4.6, 1140, 115.8, and 152.4
149
150 D) It seems that the 'Very Low' group has the highest percentage of occurrence, being at 24.72%.
151
152 E) It seems that the 'Moderate' group has the lowest standard deviation of Ratio with a value of 0.0357726
153
154 F) The overall Median value for July 2022 was 100 degrees.
155
```

```
156
157 G) If I am reading the Proc Univariate table correctly then 76.30% of TFMAX22 were missing.
158
    H) The two highest values both occurred on the 19th day. */
```