```
1          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
72
73         ********************************************************************************
74         *  TITLE :      SAS GRAIN PRICE PROJECT
75         *
76         *  DESCRIPTION: Final project for BIOS 7400 with Xiao Song, UGA, Spring 2022.
77         *               Cleaning data for grain price analysis.
78         *
79         *-------------------------------------------------------------------------------
80         *  JOB NAME:    cleaning.SAS
81         *  LANGUAGE:    SAS v9.4 (on demand for academics)
82         *
83         *  NAME:        Zane Billings
84         *  DATE:        2022-04-20
85         *
86         ********************************************************************************;
87
88         FOOTNOTE "Job run by Zane Billings on &SYSDATE at &SYSTIME";
89
90         TITLE 'Grain Price Analysis';
91
92         OPTIONS NODATE LS=95 PS=42;
93
94         LIBNAME HOME '/home/u59465388/SAS-Grain-Prices';
NOTE: Libref HOME was successfully assigned as follows:
      Engine:        V9
      Physical Name: /home/u59465388/SAS-Grain-Prices
95
96         ********************************************************************************;
97         * Macros;
98         ********************************************************************************;
99
100        * Variables for filtering the years to export in the cleaned dataset. I have
101        them set to the min/max values in the dataset, but this allows for easier
102        changing than specifying the years manually.;
103        %LET MINYEAR = 1866;
104        %LET MAXYEAR = 2021;
105
106        * Variable for controlling whether the following macro prints to the report.
107        It is easier to toggle this in one place than to add or remove the macro
108        calls later in the script.
109        1: Prints first &PRINTN observations of the dataset and the descriptor
110        portion as well.
111        Any other value (preferably 0): does not print (indeed, the macro will
112        not execute anything after the logical step).;
113        %LET VERBOSE = 1;
114        %LET PRINTN = 10;
115
116        * Macro for printing values and descriptor portion of data;
117        %MACRO DESCRIBE (DAT =, N = &PRINTN);
118        %IF %EVAL(&VERBOSE = 1) %THEN %DO;
119        PROC PRINT DATA = &DAT (OBS = &N) LABEL;
120        RUN;
121
122        PROC CONTENTS DATA = &DAT;
123        RUN;
124        %END;
125        %MEND;
126
127        ********************************************************************************;
128        * Data importing;
129        ********************************************************************************;
130
```

```
131         * Import the temperature anomaly data;
132         FILENAME NASATEMP "/home/u59465388/SAS-Grain-Prices/nasatemp.txt";
133         DATA TEMP;
134         * Read in the NASA temperature data. The data starts at line 9.;
135         INFILE NASATEMP FIRSTOBS = 9;
136
137         * Bring the next line of the INFILE into the input buffer;
138         INPUT @;
139
140         * If the first detectable word (which should be the YEAR) is not a numeric
141           digit, delete the row from the buffer, and thus do not import it.
142           This skips the blank rows and repeated header rows.
143           After DELETE is executed, return to the beginning of the data step.;
144         IF NOTDIGIT(SCAN(_INFILE_, 1)) THEN DELETE;
145
146         * If the YEAR is a number, import the current infile into the dataset;
147         ELSE DO;
148         * The data has missing values coded as '****', replace these with . so that
149           SAS interprets them as missing correctly.;
150         _INFILE_ = TRANSTRN(_INFILE_, "****", ".");
151         * Read in only the first 13 columns.;
152         INPUT YEAR JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC;
153         END;
154
155         * Get the yearly average, and then divide by 100 to make the units degrees C.
156         Round to two decimal places.;
157         TEMP = ROUND(MEAN(OF JAN -- DEC) / 100, 0.01);
158         DROP JAN -- DEC;
159
160         * Give information labels to the variables;
161         LABEL
162         YEAR = "Calendar year"
163         TEMP = "Temperature diff. (deg. C)"
164         ;
165         RUN;

NOTE: The infile NASATEMP is:
      Filename=/home/u59465388/SAS-Grain-Prices/nasatemp.txt,
      Owner Name=u59465388,Group Name=oda,
      Access Permission=-rw-r--r--,
      Last Modified=21Apr2022:19:12:22,
      File Size (bytes)=16794

NOTE: 164 records were read from the infile NASATEMP.
      The minimum record length was 0.
      The maximum record length was 104.
NOTE: The data set WORK.TEMP has 143 observations and 2 variables.
NOTE: DATA statement used (Total process time):
      real time           0.07 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              882.15k
      OS Memory           30632.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        24  Switch Count  2
      Page Faults                       0
      Page Reclaims                     283
      Page Swaps                        0
      Voluntary Context Switches        18
      Involuntary Context Switches      0
      Block Input Operations            40
      Block Output Operations           264


166
```

```
167        %DESCRIBE(DAT = WORK.TEMP);

NOTE: There were 10 observations read from the data set WORK.TEMP.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.03 seconds
      user cpu time       0.04 seconds
      system cpu time     0.00 seconds
      memory              2410.84k
      OS Memory           31912.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        25  Switch Count  0
      Page Faults                       0
      Page Reclaims                     800
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           8



NOTE: PROCEDURE CONTENTS used (Total process time):
      real time           0.05 seconds
      user cpu time       0.05 seconds
      system cpu time     0.01 seconds
      memory              1675.78k
      OS Memory           33196.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        26  Switch Count  0
      Page Faults                       0
      Page Reclaims                     427
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      1
      Block Input Operations            0
      Block Output Operations           8


168
169        * Import the presidential party data;
170        FILENAME PRESI '/home/u59465388/SAS-Grain-Prices/presidential.csv';
171        DATA PRES;
172        * Set length of variables to ensure character vars don't get cut off;
173        LENGTH YEAR 4 PRES $ 20 PARTY $ 25;
174
175        * Import CSV file, nothing complicated like the last file;
176        INFILE PRESI DLM = ',' FIRSTOBS = 2;
177        INPUT YEAR PRES $ PARTY $;
178
179        * Abraham Lincoln and Andrew Johnson are listed as 'National Union' party
180        members, but this isn't terribly useful. Historically, Abraham Lincoln
181        was a Republican and Andrew Johnson was a Democrat, and the National Union
182        coalition was a transitionary step. So I'll recode these two for simplicity.;
183        IF PRES = "Abraham Lincoln" THEN PARTY = "Republican";
184        ELSE IF PRES = "Andrew Johnson" THEN PARTY = "Democrat";
185
186        * Add descriptive labels;
187        LABEL
188        YEAR = "Calendar year"
189        PRES = "President name"
190        PARTY = "President party"
191        ;
192        RUN;

NOTE: The infile PRESI is:
```

```
      Filename=/home/u59465388/SAS-Grain-Prices/presidential.csv,
      Owner Name=u59465388,Group Name=oda,
      Access Permission=-rw-r--r--,
      Last Modified=21Apr2022:20:19:26,
      File Size (bytes)=7602

NOTE: 227 records were read from the infile PRESI.
      The minimum record length was 20.
      The maximum record length was 44.
NOTE: The data set WORK.PRES has 227 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              773.84k
      OS Memory           33192.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        27  Switch Count  2
      Page Faults                       0
      Page Reclaims                     108
      Page Swaps                        0
      Voluntary Context Switches        15
      Involuntary Context Switches      0
      Block Input Operations            16
      Block Output Operations           264


193
194       * The presidential data only goes through 2013, so we will have to manually
195       input the 2013 - 2022 data and append that to the end.;
196       DATA PRES_END;
197       LENGTH YEAR 4 PRES $ 20 PARTY $ 25;
198       INPUT YEAR PRES $ PARTY $;
199       LABEL
200       YEAR = "Calendar year"
201       PRES = "President name"
202       PARTY = "President party"
203       ;
204       INFILE DATALINES DSD DLM = " ";
205       DATALINES;

NOTE: The data set WORK.PRES_END has 9 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              668.84k
      OS Memory           33192.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        28  Switch Count  2
      Page Faults                       0
      Page Reclaims                     92
      Page Swaps                        0
      Voluntary Context Switches        18
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


215       ;
216       RUN;
217
218       * Now append the second dataset to the end of the first;
219       PROC APPEND BASE = WORK.PRES DATA = WORK.PRES_END;
220       RUN;
```

```
NOTE: Appending WORK.PRES_END to WORK.PRES.
NOTE: There were 9 observations read from the data set WORK.PRES_END.
NOTE: 9 observations added.
NOTE: The data set WORK.PRES has 236 observations and 3 variables.
NOTE: PROCEDURE APPEND used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              1006.84k
      OS Memory           33712.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        29  Switch Count  0
      Page Faults                       0
      Page Reclaims                     128
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           16


221
222        %DESCRIBE(DAT = WORK.PRES);

NOTE: There were 10 observations read from the data set WORK.PRES.
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              760.53k
      OS Memory           33448.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        30  Switch Count  0
      Page Faults                       0
      Page Reclaims                     98
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      1
      Block Input Operations            0
      Block Output Operations           24



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              959.65k
      OS Memory           33708.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        31  Switch Count  0
      Page Faults                       0
      Page Reclaims                     105
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      6
      Block Input Operations            0
      Block Output Operations           8


223
224        * Import the inflation data;
225        FILENAME INFL '/home/u59465388/SAS-Grain-Prices/inflation_data.csv';
226        DATA INFLATION;
```

```
227         * Import CSV file, easy like the presidential data;
228         INFILE INFL DLM = ',' FIRSTOBS = 2;
229         INPUT YEAR VALUE INFL;
230
231         * Create a new column for relative 'worth': 1 / value in 1886 dollars
232           is the 'buying power' of $1 relative to an 1866 dollar.;
233         PWR = ROUND(1 / VALUE, 0.01);
234
235         * Assign descriptive lables;
236         LABEL
237         YEAR = 'Calendar year'
238         VALUE = 'Adjusted value'
239         INFL = 'Rate of inflation'
240         PWR = 'Buying power'
241         ;
242         RUN;

NOTE: The infile INFL is:
      Filename=/home/u59465388/SAS-Grain-Prices/inflation_data.csv,
      Owner Name=u59465388,Group Name=oda,
      Access Permission=-rw-r--r--,
      Last Modified=22Apr2022:09:42:44,
      File Size (bytes)=2604

NOTE: 157 records were read from the infile INFL.
      The minimum record length was 14.
      The maximum record length was 16.
NOTE: The data set WORK.INFLATION has 157 observations and 4 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              768.18k
      OS Memory           33448.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        32  Switch Count  2
      Page Faults                       0
      Page Reclaims                     91
      Page Swaps                        0
      Voluntary Context Switches        20
      Involuntary Context Switches      0
      Block Input Operations            8
      Block Output Operations           272


243
244         %DESCRIBE(DAT = WORK.INFLATION);

NOTE: There were 10 observations read from the data set WORK.INFLATION.
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              676.90k
      OS Memory           33448.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        33  Switch Count  0
      Page Faults                       0
      Page Reclaims                     78
      Page Swaps                        0
      Voluntary Context Switches        1
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           24
```

```
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              945.93k
      OS Memory           33708.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        34  Switch Count  0
      Page Faults                       0
      Page Reclaims                     101
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           24


245
246        * Import the feed grains data. This is a complex and messy excel spreadsheet
247        that is easy to manually view but difficult to use as actual data. For
248        this project, I will only clean the first sheet.;
249        * In the current form, importing the data will be quite complicated and I think
250        impossible using PROC IMPORT. So I opened the dataset in Excel and exported
251        the sheet that I needed as a CSV file, which is what I'll import here.;
252        FILENAME FDGRN '/home/u59465388/SAS-Grain-Prices/fg-sheet1.csv';
253
254        DATA ALLGRNS;
255        * Import the CSV file. The option DSD is necessary to read in consecutive
256        delimiters as missing data, and the MISSOVER option is necessary as
257        there are missing values at the end of lines, so the INPUT specification
258        should be interpreted strictly.;
259        INFILE FDGRN DLM = ',' FIRSTOBS = 9 DSD MISSOVER;
260
261        * SAS doesn't like the missing values being denoted by ,, even with the DSD
262        option, and has a hard time parsing the numeric values. So, I'll import
263        all of the variables as character variables with silly names. The
264        names are uninformative, but easy to use all together in SAS statements.
265          Note that I have also included the trailing @ so I can check the next line
266        for all blanks, and delete the line before being read if that is the case.;
267        INPUT GRN $ YR $ V1 $ V2 $ V3 $ V4 $ V5 $ V6 $ @;
268
269        * If the next line (@) is all missing, do not read it in;
270        IF MISSING(YR) THEN DELETE;
271
272        * The grain variable is only denoted once, and is missing for all other
273        records in the time series. This part of the code saves the most recent
274        non-missing value of GRN, and then uses it to fill in the value of
275        all missing GRN values until it finds a new non-missing value.;
276        IF NOT MISSING(GRN) THEN DO;
277        TMP = GRN;
278        RETAIN TMP;
279        END;
280        ELSE GRN = TMP;
281
282        * Create a YEAR variable as the first four digits of the YR variable, which
283        looks like ####/##. Use INPUT() to make this new variable numeric.;
284        YEAR = INPUT(SUBSTR(YR, 1, 4), 4.);
285
286        * Convert the imported character variables to numeric variables. Since SAS
287        cannot modify variable types in place, we have to create two arrays. One
288        array (_CHA) holds the placeholder character variables, and the second array
289        (_NUM) holds the newly declared numeric variables with somewhat better
290        names. Then we handle the missing character values explicitly to prevent SAS
```

```
291        from complaining about the blanks, and use INPUT to parse the remaining
292        values to numbers. We use the comma informat here since some of the
293        numeric values have commas as place value separators.;
294        ARRAY _CHA{6} $ V1 - V6;
295        ARRAY _NUM{6} ACR HVT PRD YLD PCE LNR;
296        DO I = 1 TO 6;
297        IF MISSING(_CHA{I}) THEN _NUM{I} = .;
298        ELSE _NUM{I} = INPUT(_CHA{I}, COMMA8.);
299        END;
300
301        * Compute the percent change from the previous year;
302        PCT = ROUND(DIF(PCE) / LAG(PCE) * 100, 0.01);
303
304        * Compute the log of the price;
305        LPE = LOG10(PCE);
306
307        * Drop all of the temporary and placeholder variables that we don't need in
308        the cleaned dataset;
309        DROP TMP YR V1 - V6 I;
310
311        * Assign descriptive labels to the remaining useful variables.;
312        LABEL
313        GRN = "Grain commodity"
314        YEAR = "Calendar year"
315        ACR = "Acerage (M)"
316        HVT = "Acres harvested (M)"
317        PRD = "Bushels produced (M)"
318        YLD = "Yield (bushels per acre)"
319        PCE = "Price per bushel"
320        LPE = "log10 price per bushel"
321        LNR = "Loan rate per bushel"
322        PCT = "Pct change in price"
323        ;
324        RUN;

NOTE: The infile FDGRN is:
      Filename=/home/u59465388/SAS-Grain-Prices/fg-sheet1.csv,
      Owner Name=u59465388,Group Name=oda,
      Access Permission=-rw-r--r--,
      Last Modified=21Apr2022:20:52:21,
      File Size (bytes)=25338

NOTE: 582 records were read from the infile FDGRN.
      The minimum record length was 8.
      The maximum record length was 124.
NOTE: Missing values were generated as a result of performing an operation on missing values.
      Each place is given by: (Number of times) at (Line):(Column).
      1 at 302:8    1 at 302:23   1 at 302:34
NOTE: The data set WORK.ALLGRNS has 571 observations and 10 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              921.65k
      OS Memory           33708.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        35  Switch Count  2
      Page Faults                       0
      Page Reclaims                     152
      Page Swaps                        0
      Voluntary Context Switches        18
      Involuntary Context Switches      0
      Block Input Operations            56
      Block Output Operations           272
```

```
325
326         %DESCRIBE(DAT = WORK.ALLGRNS);

NOTE: There were 10 observations read from the data set WORK.ALLGRNS.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.04 seconds
      user cpu time       0.04 seconds
      system cpu time     0.01 seconds
      memory              844.65k
      OS Memory           33704.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        36  Switch Count  0
      Page Faults                       0
      Page Reclaims                     100
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           8



NOTE: PROCEDURE CONTENTS used (Total process time):
      real time           0.05 seconds
      user cpu time       0.05 seconds
      system cpu time     0.00 seconds
      memory              1005.37k
      OS Memory           33964.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        37  Switch Count  0
      Page Faults                       0
      Page Reclaims                     95
      Page Swaps                        0
      Voluntary Context Switches        0
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           40


327
328         ********************************************************************************;
329         * Data merging;
330         ********************************************************************************;
331
332         * Next, we need to do a one-to-many merge of the four datasets by year. The
333         grains dataset has up to four records for each year, so the other three
334         datasets will need to be replicated.;
335
336         * First, we must sort all data sets by year. This macro will sort an arbitrary
337         number of datasets. Note that it mutates currently existing datasets rather
338         than assigning new names to the sorted datasets.;
339
340         %MACRO SORTALL (DAT = , BYVAR = );
341         %LET N = %SYSFUNC(COUNTW(&DAT));
342         %DO I = 1 %TO &N;
343         PROC SORT DATA = %SCAN(&DAT, &I);
344         BY &BYVAR;
345         RUN;
346         %END;
347         %MEND;
348
349         %SORTALL(
350         DAT = ALLGRNS INFLATION PRES TEMP,
351         BYVAR = YEAR
```

```
352         );

NOTE: There were 571 observations read from the data set WORK.ALLGRNS.
NOTE: The data set WORK.ALLGRNS has 571 observations and 10 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              929.28k
      OS Memory           33964.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        38  Switch Count  2
      Page Faults                       0
      Page Reclaims                     199
      Page Swaps                        0
      Voluntary Context Switches        13
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264



NOTE: There were 157 observations read from the data set WORK.INFLATION.
NOTE: The data set WORK.INFLATION has 157 observations and 4 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              937.15k
      OS Memory           34220.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        39  Switch Count  2
      Page Faults                       0
      Page Reclaims                     123
      Page Swaps                        0
      Voluntary Context Switches        20
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264



NOTE: There were 236 observations read from the data set WORK.PRES.
NOTE: The data set WORK.PRES has 236 observations and 3 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              930.40k
      OS Memory           34220.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        40  Switch Count  2
      Page Faults                       0
      Page Reclaims                     111
      Page Swaps                        0
      Voluntary Context Switches        14
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264



NOTE: There were 143 observations read from the data set WORK.TEMP.
NOTE: The data set WORK.TEMP has 143 observations and 2 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              945.15k
      OS Memory           34220.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        41  Switch Count  2
      Page Faults                       0
      Page Reclaims                     114
      Page Swaps                        0
      Voluntary Context Switches        14
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


353
354        * Now we can do the actual merge. Only the records with admissible years
355        (specified by the macro variables &MINYEAR and &MAXYEAR respectively)
356        will be read in and included in the merge.;
357
358        DATA HOME.GRAINS;
359        MERGE ALLGRNS INFLATION PRES TEMP;
360        WHERE &MINYEAR <= YEAR <= &MAXYEAR;
361        BY YEAR;
362        RUN;

NOTE: MERGE statement has more than one data set with repeats of BY values.
NOTE: There were 571 observations read from the data set WORK.ALLGRNS.
      WHERE (YEAR>=1866 and YEAR<=2021);
NOTE: There were 156 observations read from the data set WORK.INFLATION.
      WHERE (YEAR>=1866 and YEAR<=2021);
NOTE: There were 157 observations read from the data set WORK.PRES.
      WHERE (YEAR>=1866 and YEAR<=2021);
NOTE: There were 142 observations read from the data set WORK.TEMP.
      WHERE (YEAR>=1866 and YEAR<=2021);
NOTE: The data set HOME.GRAINS has 571 observations and 16 variables.
NOTE: DATA statement used (Total process time):
      real time           0.12 seconds
      user cpu time       0.00 seconds
      system cpu time     0.01 seconds
      memory              2202.25k
      OS Memory           35256.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        42  Switch Count  9
      Page Faults                       0
      Page Reclaims                     366
      Page Swaps                        0
      Voluntary Context Switches        62
      Involuntary Context Switches      0
      Block Input Operations            32
      Block Output Operations           264


363
364        PROC SORT DATA = HOME.GRAINS;
365        BY GRN YEAR;
366        RUN;

NOTE: There were 571 observations read from the data set HOME.GRAINS.
NOTE: The data set HOME.GRAINS has 571 observations and 16 variables.
NOTE: PROCEDURE SORT used (Total process time):
      real time           0.01 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
```

```
      memory              933.53k
      OS Memory           34476.00k
      Timestamp           05/05/2022 02:14:53 PM
      Step Count                        43  Switch Count  1
      Page Faults                       0
      Page Reclaims                     124
      Page Swaps                        0
      Voluntary Context Switches        46
      Involuntary Context Switches      0
      Block Input Operations            288
      Block Output Operations           264


367
368        %DESCRIBE(DAT = HOME.GRAINS);

NOTE: There were 10 observations read from the data set HOME.GRAINS.
NOTE: PROCEDURE PRINT used (Total process time):
      real time           0.06 seconds
      user cpu time       0.06 seconds
      system cpu time     0.00 seconds
      memory              915.96k
      OS Memory           34216.00k
      Timestamp           05/05/2022 02:14:54 PM
      Step Count                        44  Switch Count  0
      Page Faults                       0
      Page Reclaims                     97
      Page Swaps                        0
      Voluntary Context Switches        11
      Involuntary Context Switches      0
      Block Input Operations            288
      Block Output Operations           16



NOTE: PROCEDURE CONTENTS used (Total process time):
      real time           0.06 seconds
      user cpu time       0.07 seconds
      system cpu time     0.00 seconds
      memory              1054.31k
      OS Memory           34476.00k
      Timestamp           05/05/2022 02:14:54 PM
      Step Count                        45  Switch Count  0
      Page Faults                       0
      Page Reclaims                     96
      Page Swaps                        0
      Voluntary Context Switches        4
      Involuntary Context Switches      1
      Block Input Operations            0
      Block Output Operations           48


369
370        ********************************************************************************;
371        * END OF FILE;
372        ********************************************************************************;
373
374
375        OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
387
```