

```

1      OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
70
71      title 'Gas Home Heating System Study';
72
73
74      data auto;
75          infile '/home/risahowell0/Text/furnace.data.txt';
76          input Fur_Type Chim_Area Chim_Shape Chim_Height Chim_Lin House_Typ$ House_Age Dam_Active Dam_Inactive Dam_Type$;
77          label Fur_Type = 'Type of Furnace'
78                Chim_Area = 'Chimney Area'
79                Chim_Shape = 'Chimney Shape'
80                Chim_Height = 'Chimney Height in feet'
81                Chim_Lin = 'Type of Chimney Liner'
82                House_Typ = 'Type of House'
83                House_Age = 'House age in yrs'
84                Dam_Active = 'Energy consumption with damper active'
85                Dam_Inactive = 'Energy consumption with damper inactive'
86                Dam_Type = 'Type of damper'
87                Avg = 'Average energy consumption with vent damper in'
88                Avg_Out = 'Average energy consumption with vent damper out'
89                Engy_Diff = 'The difference between energy consumption with vent damper in and out';
90
91          Avg = (Dam_Active + Dam_Inactive)/2;
92          num_Dam = input(Dam_Type, 8.);
93          format Fur_Type FurTypfmt. ;
94          format Chim_Shape ChimShpfmt. ;
95          format Chim_Lin ChimLinfmt. ;
96          format h1 h1fmt. ;
97          /*format Num_Dam DNum_Damfmt. ;*/
98
99
100         Engy_Diff = sum(Dam_Inactive - Dam_Active);
101
102         if House_Typ = ' ' then h1=.;
103         else if House_Typ = '1' then h1=1;
104         else if House_Typ = '2' then h1=2;
105         else h1=3;
106
107         if Dam_Type = ' ' then Dam =.;
108         else if Dam_Type = 'EVD' then dam = 1;
109         else dam = 0;
110

```

NOTE: Variable Avg\_Out is uninitialized.

NOTE: The infile '/home/risahowell0/Text/furnace.data.txt' is:  
 Filename=/home/risahowell0/Text/furnace.data.txt,  
 Owner Name=risahowell0,Group Name=oda,  
 Access Permission=-rw-r--r--,  
 Last Modified=February 02, 2018 15:10:46,  
 File Size (bytes)=4050

NOTE: Invalid argument to function INPUT at line 92 column 12.

RULE: -----1-----2-----3-----4-----5-----6-----7-----8-----9-----0

```

1      1 28 1 20 2 3 8 7.87 8.25 EVD 43
Fur_Type=Forced air Chim_Area=28 Chim_Shape=Round Chim_Height=20 Chim_Lin=Metal House_Typ=3 House_Age=8 Dam_Active=7.87
Dam_Inactive=8.25 Dam_Type=EVD Avg=8.06 Engy_Diff=0.38 num_Dam=. h1=Other Dam=1 _ERROR_=1 _N_=1

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

RULE: -----1-----2-----3-----4-----5-----6-----7-----8-----9-----0

```

2      2 144 2 26 0 2 75 9.43 9.66 EVD 43
Fur_Type=Gravity Chim_Area=144 Chim_Shape=Square Chim_Height=26 Chim_Lin=Unlined House_Typ=2 House_Age=75 Dam_Active=9.43
Dam_Inactive=9.66 Dam_Type=EVD Avg=9.545 Engy_Diff=0.23 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=2

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

3      3 80 3 30 1 2 44 7.16 8.33 EVD 43
Fur_Type=Forced air Chim_Area=80 Chim_Shape=Rectangular Chim_Height=30 Chim_Lin=Tile House_Typ=2 House_Age=44 Dam_Active=7.16
Dam_Inactive=8.33 Dam_Type=EVD Avg=7.745 Engy_Diff=1.17 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=3

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

4      4 100 2 24 0 2 75 8.67 8.82 EVD 43
Fur_Type=Gravity Chim_Area=100 Chim_Shape=Square Chim_Height=24 Chim_Lin=Unlined House_Typ=2 House_Age=75 Dam_Active=8.67
Dam_Inactive=8.82 Dam_Type=EVD Avg=8.745 Engy_Diff=0.15 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=4

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

5      5 168 3 35 1 2 30 12.31 12.06 EVD 43
Fur_Type=Forced water Chim_Area=168 Chim_Shape=Rectangular Chim_Height=35 Chim_Lin=Tile House_Typ=2 House_Age=30 Dam_Active=12.31
Dam_Inactive=12.06 Dam_Type=EVD Avg=12.185 Engy_Diff=-0.25 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=5

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

6      6 28 1 17 2 3 4 9.84 9.67 EVD 43
Fur_Type=Forced water Chim_Area=28 Chim_Shape=Round Chim_Height=17 Chim_Lin=Metal House_Typ=3 House_Age=4 Dam_Active=9.84
Dam_Inactive=9.67 Dam_Type=EVD Avg=9.755 Engy_Diff=-0.17 num_Dam=. h1=Other Dam=1 _ERROR_=1 _N_=6

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

7      7 64 2 24 1 2 45 16.90 17.51 EVD 43
Fur_Type=Forced air Chim_Area=64 Chim_Shape=Square Chim_Height=24 Chim_Lin=Tile House_Typ=2 House_Age=45 Dam_Active=16.9
Dam_Inactive=17.51 Dam_Type=EVD Avg=17.205 Engy_Diff=0.61 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=7

```

NOTE: Invalid argument to function INPUT at line 92 column 12.

```

8      1 64 2 18 1 1 16 10.04 10.79 EVD 43
Fur_Type=Forced air Chim_Area=64 Chim_Shape=Square Chim_Height=18 Chim_Lin=Tile House_Typ=1 House_Age=16 Dam_Active=10.04
Dam_Inactive=10.79 Dam_Type=EVD Avg=10.415 Engy_Diff=0.75 num_Dam=. h1=Ranch Dam=1 _ERROR_=1 _N_=8
NOTE: Invalid argument to function INPUT at line 92 column 12.
9      3 96 3 25 1 5 45 12.62 13.59 EVD 43
Fur_Type=Forced water Chim_Area=96 Chim_Shape=Rectangular Chim_Height=25 Chim_Lin=Tile House_Typ=5 House_Age=45 Dam_Active=12.62
Dam_Inactive=13.59 Dam_Type=EVD Avg=13.105 Engy_Diff=0.97 num_Dam=. h1=Other Dam=1 _ERROR_=1 _N_=9
NOTE: Invalid argument to function INPUT at line 92 column 12.
10     3 108 3 27 1 5 40 7.62 7.99 EVD 43
Fur_Type=Forced water Chim_Area=108 Chim_Shape=Rectangular Chim_Height=27 Chim_Lin=Tile House_Typ=5 House_Age=40 Dam_Active=7.62
Dam_Inactive=7.99 Dam_Type=EVD Avg=7.805 Engy_Diff=0.37 num_Dam=. h1=Other Dam=1 _ERROR_=1 _N_=10
NOTE: Invalid argument to function INPUT at line 92 column 12.
11     1 64 2 16 1 1 22 11.12 12.64 EVD 43
Fur_Type=Forced air Chim_Area=64 Chim_Shape=Square Chim_Height=16 Chim_Lin=Tile House_Typ=1 House_Age=22 Dam_Active=11.12
Dam_Inactive=12.64 Dam_Type=EVD Avg=11.88 Engy_Diff=1.52 num_Dam=. h1=Ranch Dam=1 _ERROR_=1 _N_=11
NOTE: Invalid argument to function INPUT at line 92 column 12.
12     2 63 3 30 1 2 40 13.43 14.42 EVD 43
Fur_Type=Gravity Chim_Area=63 Chim_Shape=Rectangular Chim_Height=30 Chim_Lin=Tile House_Typ=2 House_Age=40 Dam_Active=13.43
Dam_Inactive=14.42 Dam_Type=EVD Avg=13.925 Engy_Diff=0.99 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=12
NOTE: Invalid argument to function INPUT at line 92 column 12.
13     1 42 3 15 1 1 13 9.07 9.25 EVD 43
Fur_Type=Forced air Chim_Area=42 Chim_Shape=Rectangular Chim_Height=15 Chim_Lin=Tile House_Typ=1 House_Age=13 Dam_Active=9.07
Dam_Inactive=9.25 Dam_Type=EVD Avg=9.16 Engy_Diff=0.18 num_Dam=. h1=Ranch Dam=1 _ERROR_=1 _N_=13
NOTE: Invalid argument to function INPUT at line 92 column 12.
14     1 117 3 25 0 2 99 6.94 7.79 EVD 43
Fur_Type=Forced air Chim_Area=117 Chim_Shape=Rectangular Chim_Height=25 Chim_Lin=Unlined House_Typ=2 House_Age=99 Dam_Active=6.94
Dam_Inactive=7.79 Dam_Type=EVD Avg=7.365 Engy_Diff=0.85 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=14
NOTE: Invalid argument to function INPUT at line 92 column 12.
15     1 64 2 18 1 1 19 10.28 11.29 EVD 43
Fur_Type=Forced air Chim_Area=64 Chim_Shape=Square Chim_Height=18 Chim_Lin=Tile House_Typ=1 House_Age=19 Dam_Active=10.28
Dam_Inactive=11.29 Dam_Type=EVD Avg=10.785 Engy_Diff=1.01 num_Dam=. h1=Ranch Dam=1 _ERROR_=1 _N_=15
NOTE: Invalid argument to function INPUT at line 92 column 12.
16     1 28 1 17 2 2 30 9.37 10.26 EVD 43
Fur_Type=Forced air Chim_Area=28 Chim_Shape=Round Chim_Height=17 Chim_Lin=Metal House_Typ=2 House_Age=30 Dam_Active=9.37
Dam_Inactive=10.26 Dam_Type=EVD Avg=9.815 Engy_Diff=0.89 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=16
NOTE: Invalid argument to function INPUT at line 92 column 12.
RULE:  -----1-----2-----3-----4-----5-----6-----7-----8-----9-----0
17     2 64 2 28 0 2 60 7.93 9.46 EVD 43
Fur_Type=Gravity Chim_Area=64 Chim_Shape=Square Chim_Height=28 Chim_Lin=Unlined House_Typ=2 House_Age=60 Dam_Active=7.93
Dam_Inactive=9.46 Dam_Type=EVD Avg=8.695 Engy_Diff=1.53 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=17
NOTE: Invalid argument to function INPUT at line 92 column 12.
18     1 64 2 19 1 2 30 13.96 14.77 EVD 43
Fur_Type=Forced air Chim_Area=64 Chim_Shape=Square Chim_Height=19 Chim_Lin=Tile House_Typ=2 House_Age=30 Dam_Active=13.96
Dam_Inactive=14.77 Dam_Type=EVD Avg=14.365 Engy_Diff=0.81 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=18
NOTE: Invalid argument to function INPUT at line 92 column 12.
19     1 28 1 26 2 2 10 6.80 7.21 EVD 43
Fur_Type=Forced air Chim_Area=28 Chim_Shape=Round Chim_Height=26 Chim_Lin=Metal House_Typ=2 House_Age=10 Dam_Active=6.8
Dam_Inactive=7.21 Dam_Type=EVD Avg=7.005 Engy_Diff=0.41 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=19
NOTE: Invalid argument to function INPUT at line 92 column 12.
WARNING: Limit set by ERRORS= option reached. Further errors of this type will not be printed.
20     1 80 3 27 0 2 60 4.00 4.29 EVD 43
Fur_Type=Forced air Chim_Area=80 Chim_Shape=Rectangular Chim_Height=27 Chim_Lin=Unlined House_Typ=2 House_Age=60 Dam_Active=4
Dam_Inactive=4.29 Dam_Type=EVD Avg=4.145 Engy_Diff=0.29 num_Dam=. h1=Two-Story Dam=1 _ERROR_=1 _N_=20
NOTE: 90 records were read from the infile '/home/risahowell0/Text/furnace.data.txt'.
      The minimum record length was 43.
      The maximum record length was 43.
NOTE: Mathematical operations could not be performed at the following places. The results of the operations have been set to
missing values.
      Each place is given by: (Number of times) at (Line):(Column).
      90 at 92:12
NOTE: The data set WORK.AUTO has 90 observations and 15 variables.
NOTE: DATA statement used (Total process time):
      real time           0.00 seconds
      user cpu time       0.01 seconds
      system cpu time     0.00 seconds
      memory              649.68k
      OS Memory           29608.00k
      Timestamp           2018-02-06 02:43:21 PM
      Step Count          123   Switch Count   2
      Page Faults         0
      Page Reclaims       152
      Page Swaps          0
      Voluntary Context Switches 14
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 264

```

```
111      proc format;
```

```

112
112      ! value FurTypfmt 1 = 'Forced air' 2 = 'Gravity' 3 = 'Forced water';
NOTE: Format FURTYPFMT is already on the library WORK.FORMATS.
NOTE: Format FURTYPFMT has been output.
113

```

```

113      ! value ChimShpfmt 1 = 'Round' 2 = 'Square' 3 = 'Rectangular';
NOTE: Format CHIMSHPFMT is already on the library WORK.FORMATS.
NOTE: Format CHIMSHPFMT has been output.
114
114      ! value ChimLinfmt 0 = 'Unlined' 1 = 'Tile' 2 = 'Metal';
NOTE: Format CHIMLINFMT is already on the library WORK.FORMATS.
NOTE: Format CHIMLINFMT has been output.
115
115      ! value h1fmt 1 = 'Ranch' 2 = 'Two-Story' 3 = 'Other';
NOTE: Format H1FMT is already on the library WORK.FORMATS.
NOTE: Format H1FMT has been output.
116      /*value Num_Dam */
117

NOTE: PROCEDURE FORMAT used (Total process time):
      real time           0.00 seconds
      user cpu time       0.00 seconds
      system cpu time     0.00 seconds
      memory              99.43k
      OS Memory           29348.00k
      Timestamp           2018-02-06 02:43:21 PM
      Step Count          124  Switch Count  0
      Page Faults         0
      Page Reclaims       14
      Page Swaps           0
      Voluntary Context Switches 0
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 32

118      proc means n mean median std;

119      var Chim_Area Chim_Height House_Age Dam_Active Dam_Inactive Engy_Diff;
120

NOTE: There were 90 observations read from the data set WORK.AUTO.
NOTE: PROCEDURE MEANS used (Total process time):
      real time           0.04 seconds
      user cpu time       0.04 seconds
      system cpu time     0.01 seconds
      memory              8213.28k
      OS Memory           35772.00k
      Timestamp           2018-02-06 02:43:21 PM
      Step Count          125  Switch Count  0
      Page Faults         0
      Page Reclaims       1615
      Page Swaps           0
      Voluntary Context Switches 13
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 8

121      proc freq;

122      tables House_Typ Fur_Type Chim_Shape Chim_Lin h1 Dam_Type num_Dam /*Avg*/;
123
124      /* Question 2 */
125      /*proc glm;
126      title2 'Energy Consumption with Damper Active vs. Inactive';
127      model Dam_Active = Dam_Inactive; */

NOTE: There were 90 observations read from the data set WORK.AUTO.
NOTE: PROCEDURE FREQ used (Total process time):
      real time           0.07 seconds
      user cpu time       0.07 seconds
      system cpu time     0.00 seconds
      memory              1325.71k
      OS Memory           31148.00k
      Timestamp           2018-02-06 02:43:21 PM
      Step Count          126  Switch Count  2
      Page Faults         0
      Page Reclaims       221
      Page Swaps           0
      Voluntary Context Switches 8
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 288

128      proc ttest plots=none;

129      var Engy_Diff;
130

NOTE: PROCEDURE TTEST used (Total process time):

```

```

real time          0.02 seconds
user cpu time      0.03 seconds
system cpu time    0.00 seconds
memory            1102.90k
OS Memory          30888.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count        127  Switch Count  0
Page Faults       0
Page Reclaims     88
Page Swaps        0
Voluntary Context Switches  0
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations 448

```

```

131      proc glm plots = none;

132      title2 'Dam and Furance Type';
133      class Fur_Type;
134      model dam = Fur_Type;
135

```

NOTE: PROCEDURE GLM used (Total process time):

```

real time          0.05 seconds
user cpu time      0.05 seconds
system cpu time    0.00 seconds
memory            1820.18k
OS Memory          31928.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count        128  Switch Count  3
Page Faults       0
Page Reclaims     222
Page Swaps        0
Voluntary Context Switches 16
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations 312

```

```

136      proc freq;

137      title2 'Relationship btwn Type of Damper Vent and Categorical Variables';
138      tables Dam*Fur_Type/chisq;
139      tables Dam*Chim_Shape/chisq;
140      tables Dam*Chim_Lin/chisq;
141      tables Dam*h1/chisq;
142

```

NOTE: There were 90 observations read from the data set WORK.AUTO.

NOTE: PROCEDURE FREQ used (Total process time):

```

real time          0.13 seconds
user cpu time      0.14 seconds
system cpu time    0.01 seconds
memory            1506.06k
OS Memory          31664.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count        129  Switch Count  5
Page Faults       0
Page Reclaims     231
Page Swaps        0
Voluntary Context Switches 29
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations 592

```

```

143      proc glm plots = none;

144      title2 'Dam and Chimney Shape';
145      class Chim_Shape;
146      model Dam = Chim_Shape;

```

NOTE: PROCEDURE GLM used (Total process time):

```

real time          0.05 seconds
user cpu time      0.05 seconds
system cpu time    0.00 seconds
memory            1791.25k
OS Memory          32440.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count        130  Switch Count  3
Page Faults       0
Page Reclaims     251
Page Swaps        0
Voluntary Context Switches 16
Involuntary Context Switches 0
Block Input Operations  0

```

Block Output Operations 296

```

147      proc glm plots = none;

148      title2 'Dam and Type of Chimney Liner';
149      class Chim_Lin;
150      model Dam = Chim_Lin;

NOTE: PROCEDURE GLM used (Total process time):
      real time          0.05 seconds
      user cpu time      0.05 seconds
      system cpu time    0.00 seconds
      memory             1797.93k
      OS Memory          32440.00k
      Timestamp          2018-02-06 02:43:21 PM
      Step Count         131  Switch Count  3
      Page Faults        0
      Page Reclaims      231
      Page Swaps          0
      Voluntary Context Switches 16
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 312

```

```

151      proc glm plots = none;

152      title2 'Dam and House Type (3 Categories)';
153      class h1;
154      model dam = h1;
155

```

```

NOTE: PROCEDURE GLM used (Total process time):
      real time          0.04 seconds
      user cpu time      0.05 seconds
      system cpu time    0.00 seconds
      memory             1736.25k
      OS Memory          32440.00k
      Timestamp          2018-02-06 02:43:21 PM
      Step Count         132  Switch Count  3
      Page Faults        0
      Page Reclaims      223
      Page Swaps          0
      Voluntary Context Switches 16
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 312

```

```

156      proc reg plots= none;

157      title2 'Vent Damper Type and Quantitative Var of House';
158      model dam = House_Age Chim_Height Chim_Area;
159      /*test House_Age = ;
160      test Chim_Height = 0;
161      test Chim_Area = 0; */
162
163      /*proc freq;
164      title2 'Vent Damper Active vs. Inactive';
165      tables Dam_Active*Dam_Inactive/chisq;*/
166

```

```

NOTE: PROCEDURE REG used (Total process time):
      real time          0.04 seconds
      user cpu time      0.04 seconds
      system cpu time    0.01 seconds
      memory             2417.46k
      OS Memory          33472.00k
      Timestamp          2018-02-06 02:43:21 PM
      Step Count         133  Switch Count  2
      Page Faults        0
      Page Reclaims      317
      Page Swaps          0
      Voluntary Context Switches 14
      Involuntary Context Switches 0
      Block Input Operations 0
      Block Output Operations 64

```

```

167      proc reg plots=none;

168      title2 'Active vs. Inactive';
169      model Dam_Active=Dam_Inactive;
170

```

```

NOTE: PROCEDURE REG used (Total process time):
      real time          0.04 seconds

```

```

user cpu time      0.04 seconds
system cpu time    0.00 seconds
memory             2400.96k
OS Memory          33472.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count         134  Switch Count  2
Page Faults        0
Page Reclaims      267
Page Swaps         0
Voluntary Context Switches  11
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations  56

```

```

171      proc glm plots = none;

172      model Dam_Active = Dam_Inactive;
173

```

NOTE: PROCEDURE GLM used (Total process time):

```

real time          0.05 seconds
user cpu time      0.05 seconds
system cpu time    0.00 seconds
memory             1808.75k
OS Memory          32952.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count         135  Switch Count  2
Page Faults        0
Page Reclaims      226
Page Swaps         0
Voluntary Context Switches  9
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations  312

```

```

174      proc reg plots = none;

175      title2 'Type of Vent Damper and Energy Consumption(active)';
176      model Dam_Active = Dam;
177

```

NOTE: PROCEDURE REG used (Total process time):

```

real time          0.04 seconds
user cpu time      0.04 seconds
system cpu time    0.00 seconds
memory             2405.03k
OS Memory          33472.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count         136  Switch Count  2
Page Faults        0
Page Reclaims      262
Page Swaps         0
Voluntary Context Switches  11
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations  72

```

```

178      proc reg plots = none;

179      title2 'Types of Vent Damper and difference in mean amount';
180      model Engy_Diff = Dam;
181

```

NOTE: PROCEDURE REG used (Total process time):

```

real time          0.04 seconds
user cpu time      0.04 seconds
system cpu time    0.00 seconds
memory             2376.65k
OS Memory          33472.00k
Timestamp          2018-02-06 02:43:21 PM
Step Count         137  Switch Count  2
Page Faults        0
Page Reclaims      272
Page Swaps         0
Voluntary Context Switches  10
Involuntary Context Switches 0
Block Input Operations  0
Block Output Operations  48

```

```

182      proc reg plots = None;

183      title2 'Does engery active vary depending on type of damper (cat)';
184      model Dam_Active = Dam Dam_InActive;
185

```

186

187

199

OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;