```
1          OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
68
69         *  AST  504
70            Zainab Akinjobi
71            ANCOVA  1
72            Combine  ANOVA  and  regression  ;
73
74         data  mydata  ;
75
76         seed  = 17171 ;
77
78         do alloy  =  1 to  3 ;
79
80         do  x1  =   2.3 to   6.5  by  .4 ;
81         do rep  =  1 to 2 ;
82         stren  =   2.3*alloy  +  1.5*x1  +   1.3*rannor(seed ) ;
83         if alloy  = 3 then stren = stren +  1.5 ;
84         if alloy  = 1 then stren = stren -0.3  ;
85         output;
86         end;
87         end;
88
89         end;
90
91
92         * re-form the  data set to alloy for   reg  and  GLM  approach  ;
93
NOTE: The data set WORK.MYDATA has 66 observations and 5 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              780.25k
      OS Memory           30884.00k
      Timestamp           12/13/2021 03:46:33 AM
      Step Count                        242  Switch Count  2
      Page Faults                       0
      Page Reclaims                     89
      Page Swaps                        0
      Voluntary Context Switches        11
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           264


94         data mydata  ;
95         set  mydata  ;
96         x2 = 0 ;    x3 = 0 ;
97         if alloy = 2 then x2  = 1 ;
98         if alloy = 3 then x3  = 1 ;
99
100
101        *  print a sample of the  new dataset  ;
102
103

NOTE: There were 66 observations read from the data set WORK.MYDATA.
NOTE: The data set WORK.MYDATA has 66 observations and 7 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                         1170.18k
      OS Memory                      31144.00k
      Timestamp                      12/13/2021 03:46:33 AM
      Step Count                           243  Switch Count  2
      Page Faults                          0
      Page Reclaims                        129
      Page Swaps                           0
      Voluntary Context Switches           9
      Involuntary Context Switches         0
      Block Input Operations               0
      Block Output Operations              264


104        proc print  data  = mydata (  obs  =  15 )   ;
105        var  x1  x2  x3  alloy stren ;
106
107
108

NOTE: There were 15 observations read from the data set WORK.MYDATA.
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                       1412.87k
      OS Memory                    30884.00k
      Timestamp                    12/13/2021 03:46:33 AM
      Step Count                           244  Switch Count  0
      Page Faults                          0
      Page Reclaims                        60
      Page Swaps                           0
      Voluntary Context Switches           0
      Involuntary Context Switches         0
      Block Input Operations               0
      Block Output Operations              8


109        proc sgplot  data  = mydata  ;
110        reg  x  = x1  y = stren  / group  = alloy  ;
111        title1  ' 3 alloys ,  x1 is  weld diameter ' ;
112
113
114
115        *  regression approach  to  ANCOVA  - - - - - -  ;
116
117

118        proc reg  data  = mydata  ;
NOTE: PROCEDURE SGPLOT used (Total process time):
      real time                    0.14 seconds
      user cpu time                0.06 seconds
      system cpu time              0.01 seconds
      memory                       8478.28k
      OS Memory                    34860.00k
      Timestamp                    12/13/2021 03:46:33 AM
      Step Count                           245  Switch Count  2
      Page Faults                          0
      Page Reclaims                        1295
      Page Swaps                           0
      Voluntary Context Switches           200
      Involuntary Context Switches         0
      Block Input Operations               0
      Block Output Operations              832

NOTE: There were 66 observations read from the data set WORK.MYDATA.
```

```
119         model  stren  =  x1 x2 x3  ;
120         title1  ' regression approach to ANCOVA ';
121
122
123
124         *  Check  for equal  slopes   with proc  GLM ;
125
126

NOTE: PROCEDURE REG used (Total process time):
      real time           0.37 seconds
      user cpu time       0.16 seconds
      system cpu time     0.04 seconds
      memory              11898.56k
      OS Memory           44000.00k
      Timestamp           12/13/2021 03:46:33 AM
      Step Count                        246  Switch Count  23
      Page Faults                       0
      Page Reclaims                     12556
      Page Swaps                        0
      Voluntary Context Switches        699
      Involuntary Context Switches      0
      Block Input Operations            0
      Block Output Operations           840


127         PROC  GLM   DATA  = MYDATA ;
128         class  alloy ;
129         model  stren  = alloy  x1  x1*alloy /  ss3 ;
130         title1  '  check for equal slopes ';
131
132         run;

133
134
135         OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
145
```