data weight;

do site = '1' , '2';

   do batch = 1 to 3;

      do tablet = 1 to 5;

          input y @@;

          output;

      end;

   end;

end;

cards;

5.03

5.10

5.25

4.98

5.05

4.64

4.73

4.82

4.95

5.06

5.10

5.15

5.20

5.08

5.14

5.05

4.96

5.12

5.12

5.05

5.46

5.15

5.18

5.18

5.11

4.90

4.95

4.86

4.86

5.07

run;

proc print data=weight;

run;

/\* H0: tao(1)=tao(2)=0

H0: sigma^2(\_beta) = 0, HA: sigma^2(\_beta) > 0 \*/

proc glm data=weight;

class site batch;

model y = site batch(site);

random batch(site)/test;

run;

proc nested data=weight;

class site batch; /\* it reads it as "A, B(withinA)" \*/

var y;

/\*     it gives a "variance component" in the table, implying

   that it's reading everything as random \*/

Run;

data strength;

do head = 1 to 4;

   do machine = 'A', 'B', 'C', 'D', 'E';

      do strain = 1 to 4;

          input y @@;

          output;

      end;

   end;

end;

cards;

6 13 1 7 10 2 4 0 0 10 8 7 11 5 1 0 1 6 3 3

2 3 10 4 9 1 1 3 0 11 5 2 0 10 8 8 4 7 0 7

0 9 0 7 7 1 7 4 5 6 0 5 6 8 9 6 7 0 2 4

8 8 6 9 12 10 9 1 5 7 7 4 4 3 4 5 9 3 2 0

run;

/\* H0: tao(1) = tao(2) = ... = tao(5) [because the machines are fixed factors]

HA: At least one tao(i) is not equal to 0

H0: sigma^2(\_beta) = 0, HA: sigma^2(\_beta) > 0 \*/

proc print data=strength;

run;

proc glm data=strength;

class machine head;

model y = machine head(machine);

random head(machine)/test;

run;

proc nested data=strength;

class machine head;

var y;

run;

BEGIN HW

|  |  |  |  |
| --- | --- | --- | --- |
| **Coefficients of Expected**  **Mean Squares** | | | |
| **Source** | **batch** | **sample** | **Error** |
| **batch** | 21 | 7 | 1 |
| **sample** | 0 | 7 | 1 |
| **Error** | 0 | 0 | 1 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Nested Random Effects Analysis of Variance for Variable hardness** | | | | | | | | |
| **Variance Source** | **DF** | **Sum of Squares** | **F Value** | **Pr > F** | **Error Term** | **Mean Square** | **Variance Component** | **Percent of Total** |
| **Total** | 62 | 10940 |  |  |  | 176.451613 | 245.837491 | 100.0000 |
| **batch** | 2 | 9095.523810 | 101.63 | <.0001 | sample | 4547.761905 | 214.429327 | 87.2240 |
| **sample** | 6 | 268.476190 | 1.53 | 0.1851 | Error | 44.746032 | 2.222978 | 0.9042 |
| **Error** | 54 | 1576.000000 |  |  |  | 29.185185 | 29.185185 | 11.8717 |

|  |  |
| --- | --- |
| **hardness Mean** | 91.33333333 |
| **Standard Error of hardness Mean** | 8.49627547 |

Raw Code:

data pills;

do batch = '1', '2', '3';

           do sample = 1 to 3;

                       do rep = 1 to 7;

                                   input hardness @@;

                                   output;

                       end;

           end;

end;

cards;

85 94 91 98 85 96 93 76 87 90 91 88 94 96 95 98 94 96 99 100 93

108 100 105 109 104 102 108 117 106 103 109 100 104 102 101 108 100 99 117 109 105

71 85 78 68 85 67 76 81 70 84 83 72 81 78 72 68 80 72 75 79 74

run;

proc print data=pills;

run;

proc nested data=pills;

class batch sample;

var hardness;

run;