

1. With data in table 8.1 on p270 and in file Table8-1.txt, the life for tool A and the life of tool B are believed to be $y_A = \beta_0 + \beta_{A1}x + \epsilon$ and $y_B = \beta_0 + \beta_{B1}x + \epsilon$ where two regression lines share the intercepts.

(1) In order to test $H_0 : \beta_{A1} = \beta_{B1}$ define a combined model and write out the hypothesis to be tested.

(2) Write the SAS code including data step for the test.

2. 7.21 p258

Consider polynomial regression model, $y = \beta_0 + \beta_1x + \beta_2x^2 + \epsilon$ with data in 7-21data.txt.

(1) For the first test in (c), the F -test on the significance of the contribution of the quadratic term, write the SAS code including data step.

(2) Write your report based on SAS output.

3. 4.19 p173

Observations on x_1, x_2, x_3 and y are stored in 4-19data.txt. 9 levels of (x_1, x_2, x_3) : $(-1, -1, 1)$, $(1, -1, -1)$, $(-1, 1, -1)$, $(1, 1, 1)$, $(-1, -1, -1)$, $(1, -1, 1)$, $(-1, 1, 1)$, $(1, 1, -1)$ and $(0, 0, 0)$ define 9 populations.

(1) For ANOVA $y = \mu(x_1, x_2, x_3) + \epsilon$, calculate SSPE and its DF.

(2) The following SAS will produce ANOVA table where you can find SSPE and its DF. Run SAS to verify your computation in (1).

<pre>data a; infile "D:\4-19data.txt"; input x1 x2 x3 y; x=100*x1+10*x2+x3;</pre>	<pre>proc anova; class x; model y=x; run;</pre>
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