Exercise on the General Linear Model

Exercise in 02409, Oct. 2012

We consider a chemical process where the yield is measured at three different temperatures (40°, 60°, 80° coded to -1, 0 and 1) and using two different catalysts A and B. The outcome is

Catalyst/Temp.	-1	0	1
A	U_1	U_2	U_3
B	V_1	V_2	V_3

We assume that we for each catalyst have a linear (affine) dependence between yield (outcome) and the operating temperature.

Tasks

1. Formulate this as a general linear model and estimate the unknown parameters in the mean value expression.
2. Repeat task 1 but with the assumption that the slopes for the two catalysts are the same.
3. Repeat task 1 but now with the assumption that we have the same temperature dependence for the two catalysts.
4. Repeat task 1, but assume now that there is no temperature dependence.
5. Compute the residual sums of squares in the above cases if the actual observations were

Catalyst/Temp.	-1	0	1
A	3	4	5
B	3	2	7