

Name _____

Student Number _____

University of Toronto Mississauga
STA442/1008 2012
QUIZ 8 (9am)

In a study of the effects of combining two blood pressure drugs, patients with high blood pressure are randomly assigned to one of four treatment conditions. They get either Drug A or a placebo, and they get either Drug B or a placebo. So each patient takes two pills a day for 6 weeks. Their blood pressure after 6 weeks is the dependent variable. Use this regression model for the problem:

$$E[Y|\mathbf{X}] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 x_2,$$

where x_1 is an effect coding dummy variable for Drug A and x_2 is an effect coding dummy variable for Drug B . Remember, *effect coding* is the scheme with the minus ones.

1. (5 Points) Fill in the following table.

Drug A	Drug B	x_1	x_2	$x_1 x_2$	$E[Y \mathbf{X}]$
Drug	Drug	1	1	1	$\beta_0 + \beta_1 + \beta_2 + \beta_3$
Drug	Placebo	1	-1	-1	$\beta_0 + \beta_1 - \beta_2 - \beta_3$
Placebo	Drug	-1	1	-1	$\beta_0 - \beta_1 + \beta_2 - \beta_3$
Placebo	Placebo	-1	-1	1	$\beta_0 - \beta_1 - \beta_2 + \beta_3$

2. (5 Points) In terms of β values, give the null hypothesis you would use to test for the following. *You do **not** have to show any work.*

(a) Main effect of Drug A : ($H_0 : \beta_1 = 0$)

(b) Main effect of Drug B : ($H_0 : \beta_2 = 0$)

(c) Interaction: ($H_0 : \beta_3 = 0$)

You will not turn in any printouts this time.