

Q2: Why do we care about the hypothesis:

$$H_0: \beta_1 = \beta_2 + \beta_3 \text{ vs. } H_1: \beta_1 > \beta_2 + \beta_3 ?$$

Is there any real-life application?

A2: Say we have 3 variables in total: X_1, X_2, X_3 .

$$\text{case 1: } X_{11} = 1, X_{12} = X_{13} = 0, \hat{Y}_1 = \beta_1$$

$$\text{case 2: } X_{21} = 0, X_{22} = X_{23} = 1, \hat{Y}_2 = \beta_2 + \beta_3$$

we want to compare \hat{Y}_1 and \hat{Y}_2 .