What?

- The simple linear regression model is given by

$$Y = \beta_0 + \beta_1 X + \varepsilon$$

where β_0 is the intercept, β_1 is the slope, and ε is the error term

- Given coefficient estimates we can predict the response using

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x \qquad \text{(simple)}$$

$$\hat{y} = \hat{\beta}_0 + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_2 + \cdots + \hat{\beta}_p x_p \quad \text{(multiple)}$$

where $\hat{y}$ indicates a prediction of Y given $X = x$.

- The multiple linear regression model is given by

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_p X_p + \varepsilon$$

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