# Quiz 3

**Exercise 3.1.** The following regression model is known as

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \epsilon.$$

- ☐ Sixth order model with one predictor
- ☐ First order model with one predictor
- ☐ First order model with six predictors
- ☐ Sixth order model with six predictors

**Exercise 3.2.** The following regression model is known as

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_1^2 + \beta_3 x_1^3 + \epsilon.$$

- ☐ First order model with three predictors
- ☐ First order model with one predictor
- ☐ Third order model with one predictor
- ☐ Third order model with three predictors

**Exercise 3.3.** Interpret the $\hat{\beta}_2$ in the following model

$$\hat{y} = -0.0304 + 2.006 x_1 + 5.006 x_2.$$

**Exercise 3.4.** A 10-year study conducted by the American Heart Association provided data on how age, blood pressure, and smoking related to the risk of strokes.

- Risk of a stroke ($y$): the probability (times 100) that the patient will have a stroke over the next 10-year period.
- Age ($x_1$): patient's age
- Blood pressure ($x_2$): patient's blood pressure
- Smoking ($x_3$): 1 indicating a smoker and 0 indicating a nonsmoker. The estimated regression equation that relates risk of a stroke to the person's age, blood pressure, and whether the person is a smoker as follows:

$$\hat{y} = -91.8 + 1.08x_1 + 0.252x_2 + 8.74x_3.$$

Give a practical interpretation of $\hat{\beta}_1$.

- ☐ When patient's age increase 1 year, the risk of stroke increases 1.08%.
- ☐ When patient's age increase 1 year, the risk of stroke increases 1.08%, while the other two variables (blood pressure and smoke) are hold constant.
- ☐ The patient's age increases 1.08, if the risk of stroke increase 1 unit.
- ☐ The patient's age increases 1.08, if the risk of stroke increase 1 unit, while the other two variables (blood pressure and smoke) are hold constant.