

# Linear Regression Questions

TA. Ahmed Almohammed

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**Question 1:** When implementing linear regression of some dependent variable  $y$  on the set of independent variables  $x = (x_1, x_2, \dots, x_r)$ , where  $r$  is the number of predictors, which of the following statements will be true?

- a.  $\epsilon$  is the random interval.
- *b. Linear regression is about determining the best predicted weights by using the method of ordinary least squares.*
- *c. The estimators of the regression coefficients define the estimated regression function  $f(x) = b_0, b_1x_1 + b_2x_2 + \dots + b_rx_r$ .*
- *d.  $\beta_1, \beta_2, \dots, \beta_r$  are the regression coefficients.*

**Question 2:** In simple linear regression, the value of what shows the point where the estimated regression line crosses the  $y$  axis?

- a.  $f$
- *b.  $b_0$*
- c.  $y$
- d.  $b_1$

**Question 3:** In polynomial regression, your regression function can include nonlinear terms such as  $b_2x_1^2$ ,  $b_3x_1^3$  or even  $b_4x_1x_2$ ,  $b_5x_1^2x_2$ .

- *a. True*
- b. False

**Question 4: There are five basic steps when you're implementing linear regression:**

- 1. Check the results of model fitting to know whether the model is satisfactory.**
- 2. Provide data to work with, and eventually do appropriate transformations.**
- 3. Apply the model for predictions.**
- 4. Import the packages and classes that you need.**
- 5. Create a regression model and fit it with existing data.**

**However, those steps are currently listed in the wrong order. What's the correct order?**

- a. 4, 5, 3, 2, 1
- b. 5, 3, 1, 2, 4
- c. 5, 4, 2, 1, 3
- d. 4, 2, 5, 1, 3

**Question 5: Which of the following are optional parameters to LinearRegression in scikit-learn?**

- a. *copy\_X*
- b. *fit\_intercept*
- c. reshape
- d. fit
- e. *n\_jobs*
- f. normalize

**Question 6: While working with scikit-learn, in which type of regression do you need to transform the array of inputs to include nonlinear terms such as  $x^2$ ?**

- *a. Polynomial regression*
- b. Simple linear regression
- c. Multiple linear regression

**Question 7: Underfitting occurs when a model can't accurately capture the dependencies among data, usually as a consequence of its own simplicity. True or False?**

- *a. True.*
- b. False.

**Question 8: Overfitting happens when a model learns both data dependencies and random fluctuations, meaning that the model learns the data too well. True or False?**

- *a. True*
- b. False

**Question 9: In the mean squared error function or cost function  $J$ , our task is to find the value of  $b_0$  and  $b_1$  for which  $J(b_0, b_1)$  is:**

- *a. Minimum*
- b. Maximum