Assignment 03
Due on 2023-08-31, 23:59 UTC

1. Consider a simple linear regression model $y = \beta_0 + \beta_1 x + \epsilon$. The values of $\beta_0$ and $\beta_1$ are estimated to be 2 and 0.5, respectively. If $x$ increases by 1 unit, how much does $y$ increase on average?

Answer: $0.5$ units

2. What is the difference between logistic regression and linear regression models?

Answer: Logistic regression is used for binary classification problems, where the output is a probability between 0 and 1, while linear regression is used for predicting continuous outcomes.

3. Consider a multiple linear regression model $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon$. If $x_1$ increases by 1 unit, how much does $y$ increase on average?

Answer: $\beta_1$ units

4. What is the difference between a binary and a multinomial logistic regression model?

Answer: Binary logistic regression models the probability of a binary outcome, while multinomial logistic regression models the probability of a categorical outcome with more than two categories.

5. Consider a multiple linear regression model with $k$ predictors. How does the $R^2$ value change when a new predictor is added to the model?

Answer: $R^2$ may increase, decrease, or remain the same.

6. What is the main advantage of using logistic regression over linear regression for binary classification?

Answer: Logistic regression provides probabilities rather than making hard predictions, which can be more realistic for classification problems.

7. Consider a multiple linear regression model with $k$ predictors. How does the $R^2$ value change when a new predictor is added to the model?

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8. What is the difference between a linear and a logistic regression model?

Answer: Linear regression models a linear relationship between the input and output variables, while logistic regression models a probability using a logistic function.

9. Consider a simple linear regression model $y = \beta_0 + \beta_1 x + \epsilon$. If $x$ increases by 1 unit, how much does $y$ increase on average?

Answer: $\beta_1$ units

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