Quiz 2 - Week #2

Due No due date	**Points** 20	**Questions** 10	**Time Limit** None

Attempt History

	Attempt	**Time**	**Score**
LATEST	**Attempt 1**	8 minutes	8 out of 20

Score for this quiz: **8** out of 20
Submitted Jan 20 at 1:59pm
This attempt took 8 minutes.

Question 1   0 / 2 pts

(1) True/False: The regression model Y = b0 + b1*X1 + b2*X2 + e is a simple linear regression model.

You Answered

   ◉ True

> False – The term 'simple linear regression model' refers to a linear regression model with one predictor variable.

Correct Answer

   ○ False

Question 2   0 / 2 pts

(2) True/False: The regression model Y = b0 + b1*X1^2 + e is a linear regression model.

Correct Answer

   ○ True

You Answered

○ False

> True – The term 'linear model' refers to any model that is linear in the parameters. It does not require that the relationship between X and Y is a linear relationship.

Question 3   2 / 2 pts

(3) True/False: Consider the estimated regression model Y = 0.5 + 1.2*X1. This model was estimated on a data set where X1 has a range of values between 8 and 34. Should we use the model to predict Y-hat=2.9 for X1=2?

○ True

Correct!

○ False

> False – Regression models are intended to be used for interpolation, not extrapolation, and hence regression models should not be used to predict response values for values of the predictor variables outside of the range used in the estimation. This is easy to understand in the case of simple linear regression, but more difficult in the case of multiple linear regression.

Question 4   2 / 2 pts

(4) True/False: The regression residual e(i) is computed as e(i) = Y-hat(i) – Y(i).

○ True

Correct!

○ False

False – The regression residual is computed as e(i) = Y(i) – Y-hat(i), i.e. the residual is always computed as the actual value minus the predicted value.

Question 5   0 / 2 pts

(5)   True/False: R-Squared is computed in the same manner (i.e. the same formula) whether or not the regression model contains an intercept.

ou Answered

⦿ True

False – The R-Squared value for the no intercept model is computed with a similar formula as in the case of the intercept model. The formula is the same if you set Y-bar equal to zero, even if Y-bar is not equal to zero in the data. This is where the difference occurs. The R-Squared value for the no intercept model assumes a sample mean of zero, or ties the 'center' to the origin and not the overall mean.

orrect Answer

◯ False

Question 6   0 / 2 pts

(6)   True/False: Consider the models Y = b0 + b1*X1 + e (M1) and Y = b0 + b1*X1 + b2*X2 + e (M2). If both of these models were estimated on the same data set, then the R-Squared for M2 would be greater than or equal to the R-Squared for M1.

orrect Answer

◯ True

ou Answered

⦿ False

True – R-Squared is monotonic in the number of predictor variables. Adding variables to an existing model will never cause the R-Squared to decrease.

Question 7

2 / 2 pts

(7) True/False: The regression coefficients associated with the predictor variables are also known as 'partial regression coefficients'.

Correct!

◉ True

True – Regression coefficients are estimated with respect to the other predictor variables (and their coefficients) in the model, hence they are sometimes called 'partial regression coefficients' since they represent the partial effect of the predictor variable.

○ False

Question 8

0 / 2 pts

(8) True/False: When comparing two models with a different number of predictor variables, we can choose the model with the larger R-Squared value as the better model.

'ou Answered

◉ True

False – Since R-Squared is monotonic in the number of predictor variables, we would always choose the model with the larger number of predictor variables. When comparing models of different sizes, we should use a metric like adjusted R-Squared, which provides a trade-off between model fit and model complexity.

orrect Answer ○ False

Question 9
0 / 2 pts

(9) True/False: In linear regression under the assumption of normality maximum likelihood estimation and least squares estimation will yield the same parameter estimates.

orrect Answer ○ True

'ou Answered ◉ False

> True – Under the assumption of normality the parameter estimates of a linear regression model will be the same whether estimated by maximum likelihood or least squares.

Question 10
2 / 2 pts

(10)   True/False: The regression model Y= b0 + b1*X1 + b2*X2 + b3*X1*X2 + e has an interaction term.

Correct! ◉ True

> True – The term X1*X2 is the interaction term. In this case these three predictor variables fit a surface to the response variable Y.

○ False

Quiz Score: **8** out of 20