Quiz 3 - Week #3

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

Instructions

All quizzes are open book and open notes, but closed internet. This quiz has no time limit, but the quiz must be completed in one sitting.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	109 minutes	18 out of 20

Score for this quiz: **18** out of 20
Submitted Jan 21 at 11:53am
This attempt took 109 minutes.

Question 1

2 / 2 pts

(1) Linear regression assumes:

- a. The relationship between X and Y is a straight line.
- b. The residuals are normally distributed.
- c. The residuals are homoscedastic.
- d. Both homoscedastic and normally distributed residuals.

Correct!

Question 2

2 / 2 pts

(2) Often times, residual plots as well as other plots of the data will suggest some difficulties or abnormalities in the data. Which of the following

statements are not considered difficulties?

a. A nonlinear relationship between X and Y is appropriate.

Correct!

b. The variance of the error term (and of Y) is constant.

c. The error term does not have a normal distribution.

d. The selected model fits the data well except for very few discrepant or outlying data values, which may have greatly influenced the choice of the regression line.

Question 3

2 / 2 pts

(3) The Analysis of Variance (ANOVA) table in linear regression can be used to compute:

a. R-Squared

b. Adjusted R-Squared

c. The Overall F statistic

Correct!

d. R-Squared, Adjusted R-Squared, and the Overall F statistic

Question 4

2 / 2 pts

(4) The hat matrix is given by:

a. X

b. X'X, where ' denotes the matrix transpose

c. inv(X'X)*X', where we let inv() denote the matrix inverse

Correct!

d. X*inv(X'X)*X'

Question 5

2 / 2 pts

(5) Consider the Simple Linear Regression model. If the COV[X,Y] = 2.4, VAR[X] = 1.2, X-bar = 9.6, and Y-bar = 23.4, then compute the slope coefficient Beta1. Enter your answer with three decimal places of precision, e.g. 0.001.

Correct!

2

Beta1 = COV[X,Y] / VAR[X] = 2.4 / 1.2 = 2

orrect Answers

2.0 (with margin: 0.01)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)

Question 6

2 / 2 pts

(6) Consider the Simple Linear Regression model. If the COV[X,Y] = 2.4, VAR[X] = 1.2, X-bar = 9.6, and Y-bar = 23.4, then compute the intercept Beta0. Enter your answer with three decimal places of precision, e.g. 0.001.

Correct!

4.2

First compute Beta1 = COV[X,Y] / VAR[X] = 2.4 / 1.2 = 2.

Beta0 = 23.4 – 2*9.6 = 4.2

orrect Answers

4.2 (with margin: 0.01)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)
0.0 (with margin: 0.0)

Question 7

2 / 2 pts

(7) Diagnostics for assessing the Goodness-of-Fit for a linear regression model include:

- a. Plotting Y-hat versus Y.
- b. Plotting a Quantile-Quantile plot of the residuals.
- c. Plotting Y against each continuous predictor variable.

Correct!

- d. d. Plots of Y-hat versus Y, a Quantile-Quantile plot of the residuals, and Y against each continuous predictor variable.

Question 8

2 / 2 pts

(8) Heteroscedasticity can be detected graphically by plotting the residuals against the in-sample predicted value Y-hat by visualizing these shapes:

- a. a tube
- b. a funnel
- c. a double bow
- d. a nonlinear pattern

Correct!

e. a funnel, a double bow, or any nonlinear pattern

Question 9

0 / 2 pts

(9) The specification of a predictor effect can be validated using:

a. a histogram of the residuals

orrect Answer

b. a scatterplot of the residuals against the predictor variable of interest

'ou Answered

c. a scatterplot of the residuals against the predicted values Y-hat

d. a Quantile-Quantile plot of the residuals

Question 10

2 / 2 pts

(10) Models need to be validated:

a. In-sample

b. Out-of-sample

Correct!

c. Both in-sample and out-of-sample

Quiz Score: **18** out of 20