Quiz 7

Due Dec 5 at 11:59pm   **Points** 20   **Questions** 20   **Time Limit** None
Allowed Attempts 2

Attempt History

	Attempt	Time	Score
KEPT	**Attempt 2**	31 minutes	20 out of 20
LATEST	**Attempt 2**	31 minutes	20 out of 20
	Attempt 1	53 minutes	14.25 out of 20

Score for this attempt: **20** out of 20
Submitted Dec 5 at 4:44pm
This attempt took 31 minutes.

Question 1   1 / 1 pts

In a simple linear regression analysis, what is the quantity by which the response changes with a unit change in the predictor?
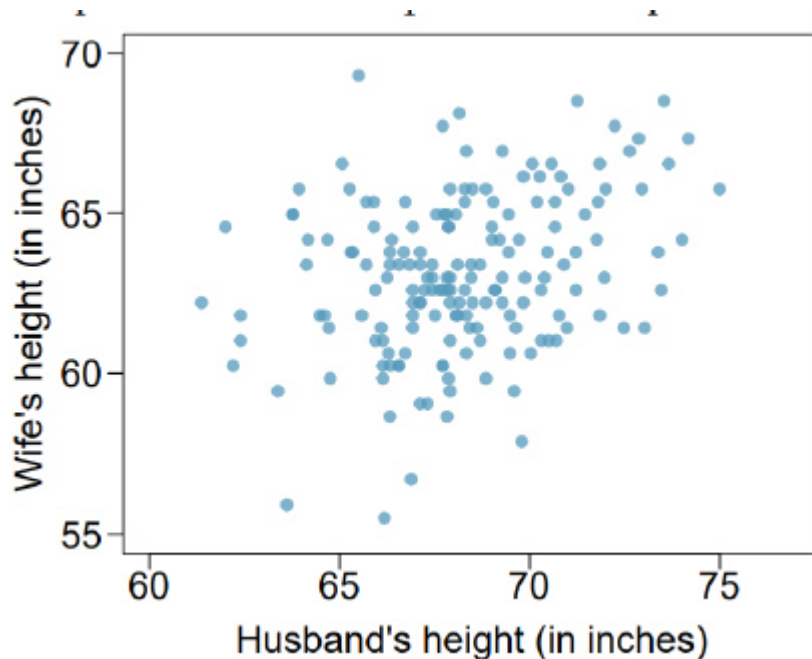
Correct!

- ⦿ slope of the regression line.

- ○ coefficient of determination.

- ○ correlation coefficient.

- ○ standard error.

Question 2   1 / 1 pts

The scatterplot below summarizes husbands' and wives' heights in a random sample of 170 married couples in Britain, where both partners' ages are below 65 years. Summary output of the least squares fit for predicting wife's height from husband's height is also provided in the table below.

	Estimate	Std. Error	t value	Pr($>|t|$)
(Intercept)	43.5755	4.6842	9.30	0.0000
height_husband	0.2863	0.0686	4.17	0.0000

What is the predicted wife's height for the husband from Britain who is 75 inches? Find the closest possible number.

Correct!

- ◉ 65.048

- ○ 68.156

- ○ 75.8

- ○ 70.567

wife's height=75*0.2863+43.5755

Question 3   1 / 1 pts

If there is no apparent linear relationship between the variables, then the correlation will be near zero.

Correct!

◉ True

○ False

Question 4   1 / 1 pts

When we check for linearity assumption by examining the residual plot, the residuals must

Correct!

◉ be randomly scattered.

○ be below the x-axis.

○ exhibit a linear trend.

○ exhibit a negative linear trend.

Question 5   1 / 1 pts

Applying regression to time series data, i.e., sequential observations in time, such as a stock price each day violates the assumption of independence of observations.
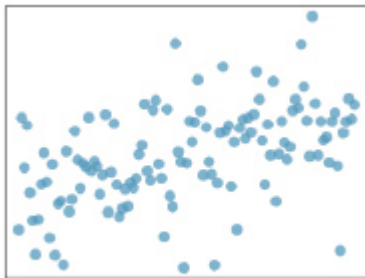
Correct!

◉ True

○ False

Question 6   1 / 1 pts

Choose most appropriate correlation for each scatterplot.

Correct!
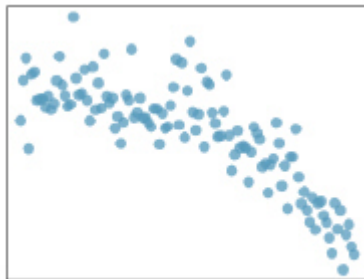
(1)

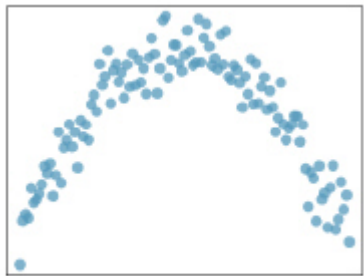R = -0.75 ⌄

Correct!

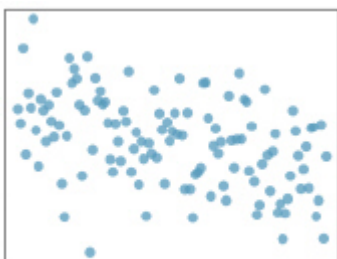
(2)

R = 0.29 ⌄

Correct!

(3)

R = -0.03 ⌄

Correct!

(4)

R = -0.29 ⌄

Question 7   1 / 1 pts

If two interval-ratio variables, such as customer satisfaction and affective commitment, were perfectly positively correlated they would give a correlation coefficient of?

Correct!

◉ 1

○ -1

○ 0.25

○ -0.25

Question 8   1 / 1 pts

The scatter chart below displays the residuals versus the predicted dependent variable of a simple linear regression model. Which of the following conclusions can be drawn from the scatter chart given below?
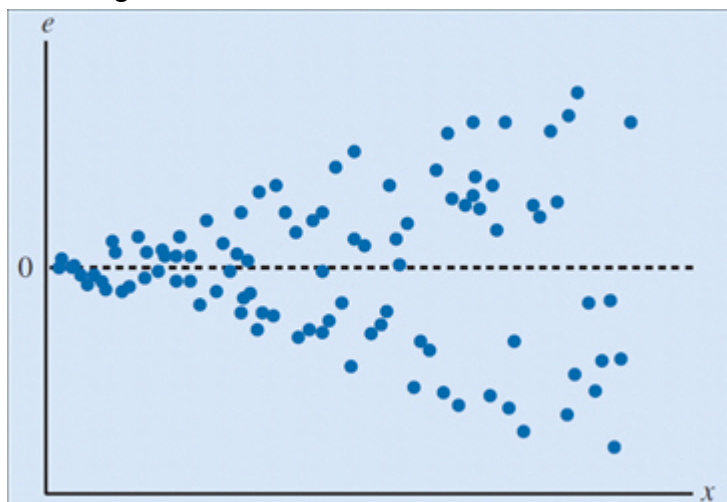
○ The residual distribution is consistently scattered about zero.

○ The model captures the relationship between the variables accurately.

○ The residuals follow the standard normal probability distribution.

Correct!   ◉ The variance of residuals is not constant.

Question 9   1 / 1 pts

The least squares regression line minimizes the sum of the

○ absolute deviations between actual and predicted predictor values.

Correct!   ◉ squared differences between actual and predicted response values.

○ absolute deviations between actual and predicted response values.

○ squared differences between actual and predicted predictor values.

Question 10   1 / 1 pts

An online retailer uses the number of website clicks to predict sales revenue for an online hair-replacement (wig) company. The R^2 statistic represents?

○

The percentage of variance in the predictor (clicks) variable accounted for by the outcome (sales revenue) variable.

Correct!

○ The proportion of variance in the outcome variable (sales revenue) accounted for by the predictor (clicks).

○ The proportion of variance in the predictor variable (clicks) accounted for by a variable other than sales revenue.

○ The percentage of variance in the outcome variable (sales revenue) accounted for by a variable other than clicks.

Question 11　　　　　　　　　　　　　　　　　　　　　　1 / 1 pts

The following regression output is for predicting the heart weight (in g) of cats from their body weight (in kg). The coefficients are estimated using a dataset of 144 domestic cats.

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-0.357	0.692	-0.515	0.607
body wt	4.034	0.250	16.119	0.000
$s = 1.452$	$R^2 = 64.66\%$			$R^2_{adj} = 64.41\%$

Which of the following statements can NOT be made from the regression output above?

○ The estimated regression equation is Heart wt=-0.357+4.034*body wt

○ body_wt is statistically significant at 5% significance level.

Correct!

⊙ Body weight explains 1.452% of the variability in weights of cats' hearts

○ Correlation coefficient between *heart wt* and *body wt is* about 0.8041

Question 12

1 / 1 pts

The correlation between employee IQ and productivity in a factory is .12 with a significance of $p < .01$. What can we conclude?

Correct!

- ● There is a small relationship between IQ an productivity.

- ○ IQ causes productivity.

- ○ There is a large relationship between IQ and productivity.

- ○ There is not a significant relationship.

Question 13

1 / 1 pts
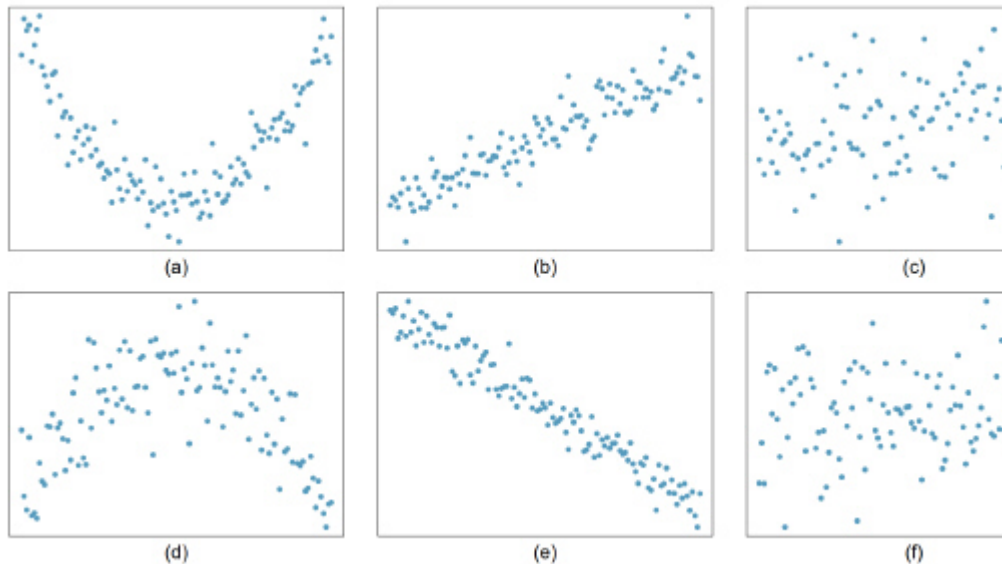
We have six scatter plots above that show the relationship between two variables. Based on the plots, which of the following statements can NOT be said?

◀ ▶

○ Plot (a) shows a strong relationship but a linear fit would not fit the data.

○ Plot (d) shows a moderate relationship but a linear fit would not be reasonable

○ Plot (b) shows a strong relationship, and a linear fit would be reasonable

Correct!

◉ Plot (c) shows a moderate relationship and a non-linear relationship is reasonable.

Question 14   1 / 1 pts

A researcher conducts some research in which they identify a significant positive correlation (r = .42) between job satisfaction and manager competency (both considered numerical variables). Which of the following is an **inappropriate** conclusion?

○ That improved manager competency is associated with more satisfied employee

○ The relationship is positive.

Correct!

◉ More satisfied employees have incompetent managers.

○ It is possible to predict someone's job satisfaction based on the competency of their manager.

Question 15   1 / 1 pts

We have a simple linear model Y= a+bX to predict annual income (Y) with years of schooling (X). The sample contains 500 observations with the average income of $50,000 and a standard deviation of $4,500. The mean years of schooling is 16 years with a standard deviation of 3 years. The correlation between income and years of schooling is 0.45.
Given the information, what is the ordinary least square estimate of the the slope b? (Note: You may need to check the book for the equations for slope coefficient and intercept for a simple linear regression model)

Correct!

○ b= 675

○ b=0.0003

○ b=0.003

○ b=11.1111

Question 16   1 / 1 pts

We have a simple linear model Y= a+bX to predict annual income (Y) with years of schooling (X) as the only predictor. There are 500 observations with the average income of $30,000 and the standard deviation of $3,500. The mean years of schooling is 16 years with a standard deviation of 1 year. The correlation between income and years of schooling is 0.45. The ordinary least square estimate of the the slope b is 1,575 so the linear model is Y= a +1575X. What is the estimated intercept a?

(Note: You may need to check the book for the equations for the slope coefficient and intercept for a simple linear regression model)

Correct!

○ a= 4800

○ a=1575

○ a=0

○ a=3500

> The line goes through the means of X and Y.

Question 17   1 / 1 pts

Which of the following statements are true about covariance?

Correct!

◉ All of these answers are correct.

○ Covariance is an unstandardized version of the correlation coefficient.

○ Covariance is a measure of the strength of relationship between two variables.

○ Covariance is dependent on the units of measurement of the variables.

Question 18   1 / 1 pts

The following regression output is for predicting the heart weight (in g) of cats from their body weight (in kg). The coefficients are estimated using a dataset of 144 domestic cats.

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$s = 1.452$		$R^2 = 64.66\%$		$R^2_{adj} = 64.41\%$

The estimated heart weight for 0 body weight is -0.357. What is this prediction?

Correct!

- ◉ Extrapolation

- ○ Interpolation

- ○ None

Question 19

1 / 1 pts

Medical researchers at a large city hospital investigating the impact of prenatal care on newborn health collected data from 882 births during 1998–2000. They kept track of the mother's age and the number of weeks the pregnancy lasted. In a scatterplot, which variable
is better to be plotted on the horizontal axis?

- ○ The weeks the pregnancy lasted, because it is more likely to be the explanatory variable.

- ○ The mother's age, because it is more likely to be the response.

- ○ Either variable, because there is no explanatory-response distinction.

Correct!

- ◉
The mother's age, because it is more likely to be the explanatory variable.

Question 20

1 / 1 pts

Based on a random sample of adults at least 30 years old, Heathcote et. al found a linear
regression model for predicting ear length in millimeters (y) based on age (x) to be
y =55.9+0.22x. How can we interpret the slope of this linear model?

○ For a one-year increase in age, the predicted ear length will not change.

○ For a one-year increase in age, the predicted ear length will increase by 55.9 mm.

Correct!

◉ For a one-year increase in age, the predicted ear length will increase by 0.22 mm

○ For a one-year increase in age, the predicted ear length will decrease by 0.22 mm

Quiz Score: **20** out of 20