**Question 1**

1. A recent study by a major financial investment company was interested in determining  
   whether the annual percentage change in stock price for companies is linearly related  
   to the annual percent change in profits for the company. The following data was determined  
   for 7 randomly selected companies:

|  |  |
| --- | --- |
| %change stock price | % change in profit |
| 8.4 | 4.2 |
| 9.5 | 5.6 |
| 13.6 | 11.2 |
| -3.2 | 4.5 |
| 7 | 12.2 |
| 18.4 | 12 |
| -2.1 | -13.4 |

1. Based upon this sample information, what portion of variation in stock price percentage change  
   is explained by the percent change in profit?
2. Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 70 percent |
|  |  | Nearly 19 percent |
|  |  | About 49 percent |
|  |  | None of these |

**1 points**

**Question 2**



A recent study by a major financial investment company was interested in determining whether the annual

percentage change in stock price for companies is linearly related to the annual percent change in profits for

the company. The following data was determined for 7 randomly selected companies:

|  |  |
| --- | --- |
| %change stock price | % change in profit |
| 8.4 | 4.2 |
| 9.5 | 5.6 |
| 13.6 | 11.2 |
| -3.2 | 4.5 |
| 7 | 12.2 |
| 18.4 | 12 |
| -2.1 | -13.4 |

Based upon this sample information, which of the following is the regression equation?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | ?= 4.19 + .61*x* |
|  |  | ?= 15.04 + 4.25*x* |
|  |  | ?= 1.19 - 3.00*x* |
|  |  | ?= 20.19 + .005*x* |

**1 points**

**Question 3**

1. A regression analysis between sales (Y) and advertising (X) (both in dollars) resulted in the following equation:  
   = 100 + 2000X  
     
   The above equation implies that an

Answer

|  |  |  |
| --- | --- | --- |
|  |  | increase of $1 in advertising is correlated with an increase of $2,000 in sales. |
|  |  | increase of $1 in advertising is correlated with an increase of $2 in sales. |
|  |  | increase of $1 in advertising is correlated with an increase of $100 in sales. |
|  |  | increase of $1 in advertising is correlated with an increase of $2100 in sales. |

**1 points**

**Question 4**

1. A study was done in which the high daily temperature and the number of traffic accidents within the city were recorded. These sample data are shown as follows:  
     
     
     
   Given this data the sample correlation coefficient is:

Answer

|  |  |  |
| --- | --- | --- |
|  |  | -0.57. |
|  |  | 0.64. |
|  |  | 1.54. |
|  |  | 0.57. |

**1 points**

**Question 5**

1. A study was recently performed by the Internal Revenue Service to determine how much tip income waiters and waitresses should make based on the size of the bill at each table. A random sample of bills and resulting tips were collected. These data are shown as follows:  
     
     
     
   Based upon these data, what is the approximate predicted value for tips if the total bill is $100?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | $15.55 |
|  |  | $20.61 |
|  |  | $26.03 |
|  |  | $12.88 |

**1 points**

**Question 6**

1. Assume that a medical research study found a correlation of -0.73 between consumption of vitamin A and the cancer rate of a particular type of cancer. This could be interpreted to mean:

Answer

|  |  |  |
| --- | --- | --- |
|  |  | the more vitamin A consumed, the lower a person's chances are of getting this type of cancer. |
|  |  | the less vitamin A consumed, the lower a person's chances are of getting this type of cancer. |
|  |  | the more vitamin A consumed, the higher a person's chances are of getting this type of cancer. |
|  |  | vitamin A causes this type of cancer. |

**1 points**

**Question 7**

1. Assume that you have calculated a prediction of??= 110 where the specific value for x is equal to the mean value of x (In other words, the difference between them is zero. or: X - Xbar = 0). Also assume that n = 201 and that the standard error of the estimate is s?= 4.5. Find the approximate 95 percent prediction interval.

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 101 ----- 119 |
|  |  | About 109.4 ----- 110.6 |
|  |  | About 104.5 ----- 105.5 |
|  |  | About 98.4 ----- 121.6 |

**1 points**

**Question 8**

1. Assuming that a regression has been conducted for a group of small companies where x = the number of employees at the company, y = annual revenue of the company (recorded in thousands of dollars), and the largest company included in the study had 82 employees. The resulting regression equation is = 59.2 + 83.4*x*. Which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | For each additional employee, revenue on average will increase by $83.4. |
|  |  | A company with 2100 employees could be predicted to have average revenue of about $175 million. |
|  |  | For each additional employee, revenue on average will increase by $59.2 thousand. |
|  |  | This model should not be used to make predictions for companies with more than 82 employees. |

**1 points**

**Question 9**

1. Consider the following partially completed computer printout for a regression analysis where the dependent variable is the price of a personal computer and the independent variable is the size of the hard drive.

Based on the information provided, what percentage of the variation in the price of the personal computers is accounted for by the regression model using hard drive capacity as the independent variable? You will find the attached handout from Dr. Jena Shafai helpful as you answer this question and similar ones which follow, related to Excel output interpretation. Make sure to enable editing, so you can see all the comments.

[Interpret Excel Regression Output.xls](https://cyberactive.bellevue.edu/@@/7C975A63B8D2FF9A5A8A3F631DAEC39D/courses/1/MBA610-T304_2141_1/assessment/34fd9395571c4310b2cce863374a2f1f/Interpret%20Excel%20Regression%20Output.xls)

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 82 percent |
|  |  | About 67 percent |
|  |  | 217.75 |
|  |  | About 66 percent |

**1 points**

**Question 10**

1. Consider the following partially completed computer printout for a regression analysis where the dependent variable is the price of a personal computer and the independent variable is the size of the hard drive.  
     
     
     
   Based on the information provided, what is the estimate for the standard error of the estimate for the regression model?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Approximately 690.50 |
|  |  | About 4,026 |
|  |  | Just under 376.23 |
|  |  | 476,800 |

**1 points**

**Question 11**

1. Given the data below, one ran the simple regression analysis of Y on X.  
     
     
   The regression equation (the relationship between Y and X) was tested for significance.?Use Excel to run the analysis. You will find the p-value (significance F) repoted by Excel is 0.1114.

Which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | significant at the alpha = 1 percent level. |
|  |  | significant at the alpha = 5 percent level. |
|  |  | significant at the alpha = 10 percent level. |
|  |  | not significant at the alpha = 10 percent level. |

**1 points**

**Question 12**

1. If a pair of quantitative variables (interval or ratio scaled) have a strong curvilinear relationship, which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The Pearson's correlation coefficient will be able to indicate that curvature is present. |
|  |  | A scatter plot will not be needed to indicate that curvature is present. |
|  |  | The Pearson's correlation coefficient will not be able to indicate the relationship is curved. |
|  |  | The Pearson's correlation coefficient will be negative. |

**1 points**

**Question 13**

1. If the population correlation between two variables is determined to be -0.70, which of the following is known to be true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | There is a positive linear relationship between the two variables. |
|  |  | There is a fairly strong negative linear relationship between the two variables. |
|  |  | An increase in one of the variables will cause the other variable to decline by 70 percent. |
|  |  | The scatter diagram for the two variables will be upward sloping from left to right. |

**1 points**

**Question 14**

1. It is believed that number of people who attend a Mardi Gras parade each year depends on the temperature that day. A regression has been conducted on a sample of years where the temperature ranged from 28 to 64 degrees and the number of people attending ranged from 8400 to 14,600. The regression equation was found to be = 2378 + 191*x*. Which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The average change in parade attendance is an additional 2378 people per one-degree increase in temperature. |
|  |  | The average change in parade attendance is an additional 191 people per one-degree increase in temperature. |
|  |  | If the temperature is 75 degrees, we can expect that 16,703 people will attend. |
|  |  | If the temperature is 0 degrees this year, then we should expect 2378 people to attend. |

**1 points**

**Question 15**

1. Residual analysis is conducted to check whether regression assumptions are met. Which of the following is not an assumption made in simple linear regression?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | Relationship between X and Y is linear |
|  |  | Resiuals must not exhibit patterns across values for X variable |
|  |  | Errors are linearly related to x. |
|  |  | Variation of the Y variable is the same across all values for the X variable.? |

**1 points**

**Question 16**

1. The National Football League has performed a study in which the total yards gained by teams in games was used as an independent variable to explain the variation in total points scored by teams during games. The points scored ranged from 0 to 57 and the yards gained ranged from 187 to 569. The following regression model was determined: = 12.3 + .12*x*.  
   Given this model, which of the following statements is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The average points scored for teams who gain zero yards during a game is -12.3 points. |
|  |  | The average yards gained will increase by .12 for every additional point scored. |
|  |  | The average change in points scored for each increase of one yard will be 0.12. |
|  |  | The average number of points scored per game is 12.3. |

**1 points**

**Question 17**

1. A regression equation was developed to explore the relationship between advertising expense (X) and profits (Y).

The data used to created the equation had advertising expense in **hundreds**, and profits in **hundred thousands**.

The equation is: Profit = 12 + 0.8\*Ad Expense

If in October you have a budget of $2,200 for advertising, what is your estimate of profits?

You may find the attached handout from Dr. Shafai helpful in answering the question.

[data units in regresson equations Answer.docx](https://cyberactive.bellevue.edu/@@/7C975A63B8D2FF9A5A8A3F631DAEC39D/courses/1/MBA610-T304_2141_1/assessment/04f8a02f763243cb9ab4e581e14e88b9/data%20units%20in%20regresson%20equations%20Answer.docx)

Answer

|  |  |  |
| --- | --- | --- |
|  |  | ?$2,960,000 |
|  |  | $1,772,000 |
|  |  | ?$29,600 |
|  |  | ?$281,600 |

**1 points**

**Question 18**

1. The following regression output is available. Notice that some of the values are missing.  
     
     
     
   Given this information, what was the sample size used in the study?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | 8 |
|  |  | 18 |
|  |  | 9 |
|  |  | 16 |

**1 points**

**Question 19**

1. The following regression output is available. Notice that some of the values are missing.  
     
     
     
   Given this information, what is the standard error of the estimate for the regression model?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | About 36.18 |
|  |  | Approximately 6.02 |
|  |  | About 1.98 |
|  |  | 3.91 |

**1 points**

**Question 20**

1. The following regression output was generated based on a sample of utility customers. The dependent variable was the dollar amount of the monthly bill and the independent variable was the size of the house in square feet.  
     
     
     
   Based on this regression output, which of the following statements is **NOT** true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The number of square feet in the house explains only about 2 percent of the variation in the monthly power bill. |
|  |  | At an alpha level equal to 0.05, there is no basis for rejecting the hypothesis that the slope coefficient is equal to zero. |
|  |  | The average increase in the monthly power bill is about 66.4 for each additional square foot of space in the house. |
|  |  | The correlation of the monthly power bill with the square footage of the house is 0.149. |

**1 points**

**Question 21**

1. Use the following regression results to answer the question below.  
     
     
     
   ANOVA  
     
     
     
     
   Which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | x explains about 88.5 percent of the variation in y. |
|  |  | y explains about 88.5 percent of the variation in x. |
|  |  | x explains about 78.4 percent of the variation in y. |
|  |  | y explains about 78.4 percent of the variation in x. |

**1 points**

**Question 22**

1. Use the following regression results to answer the question below.  
     
     
     
   ANOVA  
     
     
     
     
   The coefficient of determination is:

Answer

|  |  |  |
| --- | --- | --- |
|  |  | ?0.8851 |
|  |  | ?-0.8851 |
|  |  | ?0.7835 |
|  |  | ?-0.7835 |

**1 points**

**Question 23**

1. Use the following regression results to answer the question below.  
     
     
     
   ANOVA  
     
     
     
     
   Which of the following is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The correlation between x and y must be approximately 0.8851. |
|  |  | The correlation between x and y must be approximately -0.8851. |
|  |  | The correlation between x and y must be approximately 0.7835. |
|  |  | The correlation between x and y must be approximately -0.7835. |

**1 points**

**Question 24**

1. When using regression analysis for descriptive purposes, which of the following is of importance?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The size of the regression slope coefficient |
|  |  | The sign of the regression slope coefficient |
|  |  | The standard error of the regression slope coefficient |
|  |  | All of these |

**1 points**

**Question 25**

1. Which of the following is a correct interpretation for the regression slope coefficient?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | For a one-unit change in y, we can expect the value of the independent variable to change by b1?units on average. |
|  |  | For each unit change in x, the dependent variable will change by b1?units. |
|  |  | The average change in y of a one-unit change in x will be b1?units. |
|  |  | The average change in x of a one-unit change in y will be b1?units. |

**1 points**

**Question 26**

1. Which of the following statements is correct?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | A scatter plot showing two variables with a positive linear relationship will have all points on a straight line. |
|  |  | Two variables that have a strong linear relationship must have a Pearson's?correlation coefficient close to +1.0. |
|  |  | Two variables that have a Pearson's?correlation coefficient close to 0 may still be related in a nonlinear manner. |
|  |  | All of these are correct. |

**1 points**

**Question 27**

1. Which of the following statements is true in simple linear regression?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The sign (+ or - ) for the slope does not help determine the direction of relationship between X and Y. |
|  |  | The coefficient of determination tells us what percentage of variability in X is explained by Y. |
|  |  | Lower values of R2 are more desirable. |
|  |  | None of the above |

**1 points**

**Question 28**

1. Which of the following statements is true with respect to a simple linear regression model?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The percent of variation in the dependent variable that is explained by the regression model is equal to the square of the correlation coefficient (expressed as a percentage) between the x and y variables. |
|  |  | If the correlation coefficient between the x and y variables is negative, the sign on the regression slope coefficient will also be negative. |
|  |  | If the correlation between the dependent and the independent variable is determined to be statistically significant, the coefficient of determination will also be statistically significant. |
|  |  | All of these are true. |

**1 points**

**Question 29**

1. Which of the following statements is true with respect to a simple linear regression model?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The regression slope coefficient is the square of the correlation coefficient. |
|  |  | The percentage of variation in the dependent variable that is explained by the independent variable can be determined by squaring the correlation coefficient. |
|  |  | It is possible that the correlation between a y and x variable might be statistically significant, but the regression slope coefficient could be determined to be zero since they measure different things. |
|  |  | The standard error of the estimate is equal to the standard error of the slope. |

**1 points**

**Question 30**

1. Which of the following statements is true?

Answer

|  |  |  |
| --- | --- | --- |
|  |  | The interval estimate for predicting a particular value of y given a specific x will be narrower than the interval estimate for the average value of y given a particular x. |
|  |  | The higher the r-square value, the wider will be the prediction interval based on a simple linear regression model. |
|  |  | The prediction interval generated from a simple linear regression model will be narrowest when the value of x used to generate the predicted y value is close to the mean value of x. |
|  |  | The prediction interval generated from a simple linear regression model will be widest when the value of x used to generate the predicted y value is close to the mean value of x. |

**1 points**