Results

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100%

40
Out of 40 points

14:09
Time for this attempt

Your Answers:

1 3 / 3 points

Which of the following indicate that the result from a simple linear regression model could be potentially misleading?

- ○ The error terms exhibit homoscedasticity
- ✓ ◉ The nth error term (e_n) can be predicted with $e_n = 0.91 * e_{n-1}$
- ○ The dependent and the independent variable show a linear pattern
- ○ The error terms follow a normal distribution

2 3 / 3 points

Consider a multiple linear regression model: $Y = 0.55 + 0.93x_1 + 1.88x_2$. Which one of the following interpretation of the coefficients is correct?

- ○ Y is predicted to be equal to 0.55 when both x_1 and x_2 take the value of 1.
- ✓ ◉ A unit increase in x_2 is associated with a 1.88 increase in Y, keeping all else constant.
- ○ A 0.93 increase in x_1 is associated with a 1.88 increase in x_2.
- ○ A unit increase in x_1 is associated with an 0.93 increase in Y.

3 3 / 3 points

When testing our predictive variables for multicollinearity, we create a model in R of lm(pred1 ~ pred2 + pred3, data = dataset) and we get an R Squared of 0.85. What is the VIF for pred1?

- 0.5405
- ✓ 6.667
- 0.85
- 0.15

4 3 / 3 points

Consider a linear regression model estimating the fuel efficiency of a car in terms miles per gallon of gas (mpg) based on its origin (region A, B or C) and number of cylinders with the following formula:

$$mpg = b_0 + b_1 * RegionB + b_2 * RegionC + b_3 * Cylinders$$

The estimated values of the regression coefficients are provided below:

b_0 = 40.7

b_1 = -0.91

b_2 = 2.66

b_3 = -3.15

Based on this model, if X is the mpg of a car with 4 cylinders originated from region B, and Z is the mpg of a car with 3 cylinders originated from region A, what is the value of X - Z?

- ✓ -4.06
- -6.72
- -0.91
- -3.15

5 3 / 3 points

When you create a linear regression model with factors (i.e. male, female), R converts those factors into dummy variables

- ✓ True
- False

6 3 / 3 points

From the following regression model:
$\mathbf{Gold\_Price\_Per\_oz} = \beta_0 + \beta_1 * M2 + \beta_2 * VIX + \beta_3 * War$
Where M2 is a continuous variable of the M2 money supply, VIX is a continuous variable of the VIX index, and War is a categorical variable (0 is Time period at peace, 1 is Time period at war). Which of the following would be a part of the base case conditions?

- A high VIX index
- Period of inflation
- ✓ Time period at peace
- Time period at war

7 3 / 3 points

Given the following model: $price = b_0 + b_1 * lotsize + b_2 * lotsize^2$; how can one interpret the coefficients? Select the best answer.

- Price increases by b_2 when lotsize is increased by 1 unit
- Price increases by b_1 when lotsize is increased by 1 unit
- ✓ A quadratic model does not allow for an isolated interpretation of coefficients
- Price increases by $b_0 + b_1 + b_2{}^2$ when lotsize is increased by 1 unit

8 3 / 3 points

Select the model approximation that best matches the following statement: "As X increases by 1%, Y increases by ($b_1/100$) units, holding all other factors constant."

- $log(Y) = b_0 + b_1 * log(X)$
- $Y = b_0 + b_1 * X$
- ✓ $Y = b_0 + b_1 * log(X)$
- $log(Y) = b_0 + b_1 * X$

9 4 / 4 points

Assume that you have concluded to use a log transformation on your data to model a relationship. However, on investigating the dataset, you found negative and zero values. Choose the best way to proceed.

- ○ Use Log(x+1), where x is the variable you want to transform.
- ○ Use log(10 *x) where x is the variable you want to transform.
- ✓ ◉ Use log(x + c +1), where x is the variable you wish to transform and c is the absolute value of the most negative number.
- ○ Throw out the data points which are negative or zero.

Feedback

Based on your answer

While log(x +1) will work for zero values, we need to offset the transformation to accommodate negative values, hence adding c . Here, c is the value of the most negative number.

10 4 / 4 points

The logit function is the log of the ratio of the probability of success (belonging to a group) to the probability of failure (not belonging to a group). It is also known as the log odds function.

- ✓ ◉ True
- ○ False

11 4 / 4 points

Using the following confusion matrix, what is the sensitivity and specificity of the model?
Note: For the confusion matrix below 1 = True and 0 = False.

		Predicted Value		
		1	0	Total
Actual Value	1	107	72	179
	0	23	798	821
	Total	130	870	1000

- ○ Specificity: 0.591, Sensitivity: 0.778
- ✓ ◉ Specificity: 0.972, Sensitivity: 0.598

- Specificity: 0.917, Sensitivity: 0.879
- Specificity: 0.598, Sensitivity: 0.972

12 4 / 4 points

Which of the following case is referred to Type II error?

- Null is false and we reject it.
- Null is True, but we fail to reject it.
- Null is True but we mistakenly reject it.
- ✓ Null is false but we fail to reject it.