Quiz 4 - Week #4

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

Attempt History

	Attempt	**Time**	**Score**
LATEST	**Attempt 1**	16 minutes	12 out of 20

Score for this quiz: **12** out of 20
Submitted Feb 3 at 5:09pm
This attempt took 16 minutes.

Question 1   2 / 2 pts

(1) True/False: When using indicator variables the baseline category is represented by intercept.

Correct!

● True

> True – When using indicator variables we have at most k-1 indicator variables representing all of the categories except the baseline category, which is then represented by the intercept.

○ False

Question 2   0 / 2 pts

(2) Consider a categorical predictor with 3 levels. Levels 1 and 2 have been coded as indicator variables I1 and I2 and included in a regression model with a continuous predictor variable X1.

$$Y = b_0 + b_1*X_1 + b_2*I_1 + b_3*I_2$$

What is the intercept value for the category with level 1?

orrect Answer

○ b0+b2

○ b0

○ b0+b3

'ou Answered

◉ b0+b1

Question 3   **0 / 2 pts**

(3) Consider a categorical predictor with 3 levels. Level 1 has been coded as indicator variables I1 and included in a regression model with a continuous predictor variable X1.

Y = b0 + b1*X1 + b2*I1

What level(s) are the baseline category?

orrect Answer

○ 2 & 3

○ 3

○ 2

'ou Answered

◉ 1 & 2

Question 4   **2 / 2 pts**

(4) True/False: Consider a categorical predictor variable that has three levels denoted by 1, 2, and 3. We can include this categorical predictor variable in a regression model using this specification, where X1 is a dummy variable for

level 1, X2 is a dummy variable for level 2, and X3 is a dummy variable for level 3.

$Y = b0 + b1*X1 + b2*X2 + b3*X3$

○ True

Correct!   ● False

> False – We cannot include all three dummy variables. Any categorical variable with k levels can be included in a regression model with at most (k-1) dummy variables when an intercept is included in the model. One possible specification would be $Y = b0 + b2*X2 + b3*X3$, where level 1 is taken to be the base category.

Question 5   0 / 2 pts

(5) True/False: The model $Y = b0 + exp(b1*X1) + e$ can be transformed to a linear model.

'ou Answered   ● True

> False – Taking the natural logarithm of both sides does not yield a log-linear model.

orrect Answer   ○ False

Question 6   0 / 2 pts

(6) True/False: A variable transformation can be used as a remedial measure for heteroscedasticity.

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orrect Answer   ○ True

ʹou Answered   ◉ False

> True – Variable transformations are used for two primary reasons: (1) to stabilize the variance, i.e. a remedial measure for heteroscedasticity, and (2) to linearize the model.

Question 7   2 / 2 pts

(7) Consider a categorical predictor with 3 levels. Levels 1, 2, and 3 have been coded as indicator variables I1, I2, and I3 and included in a regression model with a continuous predictor variable X1.

$Y = b0 + b1*I1*X1 + b2*I2*X1 + b3*I3*X1$

The use of the indicator variables defines:

Correct!

   ◉ different slopes for each group

   ○ an intercept adjustment

Question 8   2 / 2 pts

(8) True/False: In linear regression transformations can be applied to both the response variable and the predictor variables.

Correct!

   ◉ True

> True – When using linear regression transformations can be applied to both the response variables and the predictor variables.

   ○ False

Question 9

2 / 2 pts

(9) True/False: Consider the case where the response variable Y is constrained to the interval [0,1]. In this case one can fit a linear regression model to Y without any transformation to Y.

○ True

Correct!

◉ False

> False – Linear regression assumes a continuous response variable over the range of the real line. In the situation where Y is constrained to the interval [0,1], one should transform Y using the arcsin transformation.

Question 10

2 / 2 pts

(10) True/False: Consider the case where the response variable Y takes only two values: 0 and 1. A linear regression model can be fit to this data.

○ True

Correct!

◉ False

> False – In the case of a binary response variable there is no transformation that will produce a valid linear regression model. In this case one should fit a logistic regression model.

Quiz Score: **12** out of 20