Dummy Variables and Practical Issues - Quiz

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Question 1

1/1 point (graded)

Which of the following is true about dummy variables? (Select all that apply)

- [x] a. They only take on one of two values: 0 or 1.
- [ ] b. They violate the basic assumptions of the linear model.
- [x] c. We can use dummy variables for any characteristic that exists on some but not all observations.
- [ ] d. Dummy variables can only be used for characteristics that are randomly assigned, like in RCTs.

✔

Explanation

Dummy variables are variables that take on only one of two values, 0 or 1. They do not violate any assumptions of linear models and can be used in the linear regressions that we have looked at. Dummy variables are useful in RCTs; often, members of the treatment group are assigned a “1” and

members of the control group are assigned a "0". However, dummy variables can also be used in any case to separate members of a population who fulfil one characteristic from the members of the population that do not fulfil that characteristic.

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✔ Correct (1/1 point)

Question 2

1/1 point (graded)

Consider the following model:

$$y = \hat{\beta}_1 x + \hat{\beta}_0$$

When X is a dummy variable, $\hat{\beta}_0$ can be interpreted as an estimate for...

- a. The mean of Y for observations where $X = 0$ ✔
- b. The variance of Y for observations where $X = 0$
- c. The mean of Y for observations where $X = 1$

The Multivariate Linear Model
due Nov 28, 2016 05:00 IST

Module 9: Homework
due Nov 21, 2016 05:00 IST

- Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias
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d. The variance of Y for observations where $X = 1$

Explanation

0 is an estimate for the y-intercept, which is where $X = 0$. If there are multiple observations where $X = 0$, which is likely if X is a dummy variable, then 0 will estimate the mean value of the dependent variable when $X = 0$.

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Question 3

1/1 point (graded)

Which of the following are examples of how we can adapt the linear model to model non-linear relationships? (Select any that apply.)

- [x] a. We can transform X and Y using nonlinear functions and perform linear regression on these transformed variables.
- [x] b. We can create interaction variables by multiplying together regressors.

c. Neither of the above. If the relationship is nonlinear, we must use a method such as kernel regression.

d. Neither of the above. The linear model is only useful if we know ahead of time (or speculate) that the relationship we are interested in islinear.

✔

Explanation

Although it may seem at first that the linear model is overly restrictive, the linear model is actually quite flexible. Through methods such as nonlinear transformations of variables or multiplying together regressors, we can use the linear model even when the relationship we are interested in is non-linear. We could also use methods such as the kernel regression, but there are tradeoffs. Linear regression is much more efficient; there are good reasons that it is the workhorse model.

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