**Universidade de São Paulo**

**Faculdade de Filosofia, Letras e Ciências Humanas**

**Departamento de Ciência Política**

**FLS-6183 & FLP-468**

**Métodos Quantitativos de Pesquisa II**

**2º semestre / 2019**

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**Lab 2 // Class 3**

**A Deeper Look at Bivariate and Multivariate OLS**

In this assignment, we will continue to work with simulated data. Last week, we began with a simple model in which our explanatory variable was a dichotomous variable. In this week, we will expand this analysis, moving from a bivariate regression with a continuous explanatory variable and then proceed to estimate a multivariate model with two explanatory variables.

**Case 1. The Effect of X on Y**

1. In this case, we are estimating a bivariate regression model in the case that our explanatory variable is a continuous variable. Please write the regression equation we are estimating.
2. What is our theoretical expectation of the estimated effect of X on Y given our simulation?
3. Is this what we observe in the estimated coefficient in the regression? How much does the estimated coefficient vary from its theoretical value? Is the theoretical value of the effect of X on Y within the 95% confidence interval?
4. Based on the simulation, what is the expected value of Y? In the do file today, we obtained estimates for the predicted or fitted values of Y. What results did we obtain from the regression model?
5. What are the expected values of the residuals? What results did we obtain from the regression model?
6. Please summarize the estimated RMSE and its interpretation.
7. Please summarize the estimated R2 and its interpretation.

**Case 2. The Effect of Z on Y**

1. In this case, we are estimating a bivariate regression model in the case that our explanatory variable is a dichotomous variable. Please write the regression equation we are estimating.
2. What is our theoretical expectation of the estimated effect of Z on Y given our simulation?
3. Is this what we observe in the estimated coefficient in the regression? How much does the estimated coefficient vary from its theoretical value? Is the theoretical value of the effect of Z on Y within the 95% confidence interval?
4. Based on the simulation, what is the expected value of Y? In the do file today, we obtained estimates for the predicted or fitted values of Y. What results did we obtain from the regression model?
5. What are the expected values of the residuals? What results did we obtain from the regression model?
6. Please summarize the estimated RMSE and its interpretation.
7. Please summarize the estimated R2 and its interpretation.

**Case 3. The Effect of X and Z on Y**

1. In this case, we are estimating a multivariate regression model. Please write the regression equation we are estimating.
2. What is our theoretical expectation of the estimated effect of X and Z on Y given our simulation? How do we interpret each coefficient?
3. Is this what we observe in the estimated coefficients? How much do these coefficients vary from our theoretical values? Are the theoretical values of the effects of X and Z on Y within the 95% confidence intervals?
4. What are the expected values of the residuals? What results did we obtain from the regression model?
5. Please summarize the estimated RMSE and its interpretation.
6. Please summarize the estimated R2 and its interpretation.