Problem set 2

Introduction to Econometrics

Due date: August 20 2024, 23:59 hrs

1 Problem 1

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------------------------------------------------------------------------
     y |      Coef.   Std. Err.       t    P>|t|    [95% Conf. Interval]
-------+----------------------------------------------------------------
    x1 |  -2.681508   1.393991             0.055    -5.424424    .0614073
    x2 |  -3.702419               -24.04   0.000    -4.005491   -3.399348
    x3 |   .1086104    .090719     1.20    0.232    -.0698947    .2871154
 _cons |   906.7392   28.26505    32.08    0.000     851.1228    962.3555
------------------------------------------------------------------------
```

- Consider the regression output above.

- Compute the t-statistic for x_1

- Compute the standard error for $\hat{\beta}_2$

- What is the estimated model? (write down the formula)

- Is x_1 statistically significant at the 90% level?

- Analyze the statistically significance of the intercept.

2 Problem 2

Mark all the assumptions that are required to have an unbiased estimator in the linear model (**Justify your answer**):

- Orthogonality $E[x_i\epsilon_i] = 0$

- $\epsilon_i \sim N(0, \sigma^2)$ (Normality of errors)

- No multicollinearity

- Homoskedasticity: $V[\epsilon_i|x_i] = \sigma_i^2$

3 Problem 3

Explain in detail (mathematically) how to contrast the null hypothesis $\hat{\beta}_2 < -3$ using the t-statistic.