(a) We are testing the hypotheses

$$H_0 : \beta_{\text{2000 Turnout}} = \beta_{\text{1998 Turnout}} = \beta_{\text{Senate Year}} = \beta_{\text{Logged Per Capita Income}} = 0$$

versus

$$H_a : \text{at least one slope coefficient is not equal to 0.}$$

We use the F–test to test these hypotheses. Here it has $p < .001$, so we reject the null; that is, the overall regression is statistically significant.

(b) We are testing the hypotheses

$$H_0 : \beta_j = 0$$

versus

$$H_a : \beta_j \neq 0,$$

for $j = 1, 2, 3, 4$. We use the t–tests for each predictor to test this. In this case the slopes for `2000 Turnout` ($p = .003$), `1998 Turnout` ($p < .001$), and `2002 Senate Year` ($p = .028$) are significant at a .05 level, while that for `Logged Per Capita Income` is not ($p = .62$).

(c) Given the other predictors are held fixed, a state having a Senate election is associated with an estimated 2.7 percentage point higher turnout.

(d) A rough prediction interval is $\pm 2s$, where s is the standard error of the estimate, so that is $\pm .074$. That is, the model can predict turnout values to within roughly 7.4 percentage points, 95% of the time.

(a) Given Rotten Tomatoes rating is held fixed, a 1% increase in cost is associated with an estimated 0.67% increase in total domestic gross (this is an elasticity).

(b) Given cost is held fixed, a 1 point increase in Rotten Tomatoes rating is associated with an estimated 1.3% increase in total domestic gross (since $10^{.005583} = 1.013$; this is a semielasticity).