The manager of a small sushi restaurant has noticed that the weak economic environment has hampered foot traffic in the area and caused a decline in sales. To thwart this trend, the manager designs an aggressive advertising campaign, which includes two-for-one coupons and early bird specials. Despite the fact that advertising increases overall costs, the manager believes the campaign has positively affected sales at the restaurant. The manager looks at monthly sales (thousands of dollars) and advertising costs (dollars) for the restaurant as well as the monthly unemployment rate from the county. Consider the data collected for 17 months.

1. Estimate 3 models and write the regression equations **(Round your answers to 4 decimal places.)**

|  |  |  |
| --- | --- | --- |
| MODEL 1 |  |  |
| MODEL 2 |  |  |
| MODEL 3 |  |  |

1. Conduct individual hypothesis tests to determine if the coefficients differ from zero.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Hypotheses | Coefficient Estimate (include sign) | P-value | Is the corresponding variable significant in explaining the variation in y? |
| MODEL 1  **Variable:** AdsCost |  |  |  |  |
| MODEL 2  **Variable:** Unemp |  |  |  |  |
| MODEL 3  **Variable:** AdsCost |  |  |  |  |
| MODEL 3  **Variable:**  Unemp |  |  |  |  |

1. Summarize the 3 models in the table below

|  |  |  |  |
| --- | --- | --- | --- |
|  | MODEL 1 | MODEL 2 | MODEL 3 |
| Multiple R |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Standard Error of the Estimate |  |  |  |

1. Which model is more appropriate for making predictions? Explain the comparisons you made to determine the best-fitting model.
2. In terms of the data, interpret the Coefficient of Determination for the model you chose.
3. In terms of the data, interpret the slope(s) of the line of best fit.
4. Use the best-fitting model to predict Sales given the mean value of the explanatory variable(s). The mean Advertising cost is 582.35 and the mean Unemployment rate is 6.26. **(Round intermediate calculations to 4 decimal places and final answer to 2 decimal places.)**