EVALUATION AND LOAD RESEARCH ANALYST "HOMEWORK" ASSIGNMENT

INSTRUCTIONS

Please respond to the questions below and email a copy of your answers to Rachel Clark at rclark2@tacoma.gov by 9AM PDT on September 15.

ASSIGNMENT

The dataset provided includes:

- Date/time field
- Hourly energy consumption (the energy consumption unit is called kilowatt hours abbreviated as "kWh") of 30 residential single-family homes that have heat pumps for their heating system
- National Oceanic and Atmospheric Administration (NOAA) daily maximum, minimum and average temperature data in Fahrenheit for the Seattle-Tacoma (SeaTac) area

1. Please provide three visualizations that help to describe important features of the data and how energy consumption relates to temperature and time of day. You may create visualizations in whatever tool you would like. Please include a description of the tools you used to prepare these results. During your interview, we will ask you to give a brief (around 5 minutes) presentation on your visualizations.

2. If Tacoma Power were considering an intervention to reduce energy consumption during winter morning peaks among homes that have heat pumps for their heating system, how might you go about designing a statistically valid study to assess the effectiveness of the potential intervention? As part of your answer, please address how you might use data like these to create a sample to study the intervention, what kind of statistical technique you might use to measure the effectiveness of the interventions and what additional data might be needed to improve your analysis. Please limit your written response to no longer than 1 page.

3. Another utility conducts a study on a similar intervention using a difference in difference technique comparing participants and non-participants before and after the intervention was in place. They find that participants use more energy relative to non-participants after participating in the program. How would you interpret these results? Please limit your written response to no longer than 1/2 page.