Writing About Operations Research – Data

1 The data section

- The purpose of the **data** section is to give your reader a sense of the data you used in your study:

  - Where does the data come from?
  - What information does the data contain?
  - What does the data "look" like?
  - What are the relationships between the key variables in your data?

- Suggested outline:

  1. **Basic description of data.** For each data source:

     a. Describe where the data came from.

     b. Describe the contents and size of your data.

        - For large tabular data: How many rows are there? What does each row represent? What does each column represent?
        - For small tabular data: Put the table directly in your report.

  2. **Exploratory data analysis.**

     a. For the key variables in your data, give a sense for what they "look" like:

        - Report their summary statistics (e.g., mean, standard deviation, min, max)
        - Report their empirical distribution[1] in a table or histogram.

     b. Demonstrate the relationships between key variables with graphical visualizations.

     c. If appropriate, provide distribution fitting analysis for relevant variables (e.g., for determining distributions to use in a simulation model).

     You will need to use your judgement to decide which summary statistics or empirical distributions of key variables to include in your report. A good guide is whether you will need to use them as inputs to your model.

     You will also need to use your judgement to decide which relationships between key variables to describe in your report. A good guide is whether these relationships give some insight into to your decision or prediction problem.

- Note: You should <u>not</u> describe your data wrangling process in detail.

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[1]The fraction of time that each value is observed in the data.

2 Presenting tables and figures

- Number each table or figure.

- Give a brief, descriptive caption for each table or figure.

- Introduce every table or figure to your reader with some text, e.g.

    The histogram in Figure 5 shows the distribution of car prices in the data.

- Don't use screenshots of tables. Take the time to make them look nice by using the table features in Word/Docs.

- For larger tables, consider using a slightly smaller font.

- Label the axes of your graphs in plain English.

- See the *Example Report* for examples.