

Instructions: More information on expectations for the report can be found in the general directions for the data analysis sets. In this document, the specifics for the individual assignment will be discussed. Students are responsible for both the requirements in the general directions, and for the specific directions discussed below.

Topic 1: Correlation analysis

Install the package {mlbench}, and download the longley dataset.

```
data("longley")  
view(longley)
```

	GNP.deflator	GNP	Unemployed	Armed.Forces	Population	Year	Employed
1947	83.0	234.289	235.6	159.0	107.608	1947	60.323
1948	88.5	259.426	232.5	145.6	108.632	1948	61.122
1949	88.2	258.054	368.2	161.6	109.773	1949	60.171

Additional information can be found here: <https://machinelearningmastery.com/machine-learning-datasets-in-r/>

Perform a thorough correlation analysis of the data. Test each of the three types of correlations: Pearson, Spearman and Kendall Tau. Do you notice any differences in the results?

Discuss each variable and its relationship to other variables. Which ones are the most problematic in terms of standard assumptions? Which ones are the most highly correlated? Use at least three graphs types to illustrate your findings.

This data is also time series data. Discuss the appropriateness of time series analysis of this data and time series plots.

Topic 2: Association Rule Mining

Install the {arules} package and load in the dataset Groceries. Additional information can be found here: <https://search.r-project.org/CRAN/refmans/arules/html/Groceries.html>

Use this dataset to find association rules for the dataset. You may use Apriori, FP-Growth or the Eclat algorithms. (A thorough analysis of one algorithm is better than thin work with several.)

Describe the rules and create appropriate graphs of your results.

You may include your code in an appendix for separate file, but the report of approximately 10 pages should focus on the analysis. It should look professionally formatted. Raw code and raw output is frowned upon.