Project 5: Machine Learning

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# Deliverable Table

The purpose of this table is to provide a complete view of the concepts covered in chapter 5 of *"Python Data Science Handbook"* (VanderPlas, 2016) and provide a general page location for where the topic was demonstrated.

|  |  |
| --- | --- |
| Deliverables | Location |
| What is Machine Learning? |  |
| Introducing Scikit-Learn |  |
| Hyperparameters and Model Validation |  |
| Feature Engineering |  |
| In-Depth: Decision Trees and Random Forests |  |

Additionally, here is a link to my GitHub were the datasets and the Jupyter Notebook for the project can be downloaded: https://github.com/jwmathis/SSE591\_Project5. In order to run the file, Python and other dependencies must be installed.

# 1. Introduction

Matplotlib provides a comprhensive and flexible interface for creating static, animated, and interactive visualizations in Python. While libraries like Pandas and NumPy are essential for data manipulation and numerical computations, Matplotlib excels at presenting this data in a visual format that can uncover insights and trends. Because of its wide range of plotting functions and customization options, it makes it an invaluable tool for data scientists who aim to present their data clearly and effectively. Additionally, its integration with Pandas and NumPy allows for seamless data visualization directly from the libraries respective data structures.

This report aims to demonstrate my proficiency in Python data visualization techniques as covered in Chapter 4 of the “Python Data Science Handbook” by Jake VanderPlas (2016). This report attempts to illustrate the core concepts and functionalities of the Pandas library by implementing the concepts into practical examples. The code presented in this report was developed using Visual Studio Code with Jupyter Notebook extensions. I will provide detailed explanations, highlighting key features and operations that make Matplotlib an essential tool for data analysis.

# 2. Predicting Ice Cream Sales Linear Regression

# 3. Fruit Classification

# 4. Pokemon Classification

# 5. Conclusion

This report documents my journey in learning Matplotlib. Matplotlib is a versatile plotting library in Python. I explored concepts that include fundamental plotting techniques essential for visualizing data and customizing the titles, labels, legends and colors of charts and graphs to enhance clarity and aesthetics. Key concepts covered include creating various types of plots such as line plots, bar charts, scatter plots, histograms, and more. By using real data and previous projects, I was able to explore how to go about creating graphs and charts.

# References

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