Data Science with Python

Month 1: Foundations of Data Science with Python

Week 1: Introduction to Data Science

- Overview of data science and its applications
- Introduction to key concepts: data, information, knowledge
- Python for data science: installation and setup, Jupyter Notebooks

Week 2-3: Python Programming for Data Science

- Variables, data types, and operators
- Control structures (if statements, loops)
- Functions and modules
- Numpy and Pandas libraries for data manipulation

Week 4-5: Data Visualization with Matplotlib and Seaborn

- Basic plotting with Matplotlib
- Advanced plotting and customization
- Data visualization with Seaborn

Week 6: Exploratory Data Analysis (EDA)

- Descriptive statistics
- Handling missing data
- Outlier detection and removal

Month 2: Machine Learning with Python

Week 1-2: Introduction to Machine Learning

- Overview of machine learning and its types
- Supervised vs. unsupervised learning
- Scikit-learn library for machine learning in Python

Week 3-4: Supervised Learning

- Regression analysis
- Classification algorithms (e.g., decision trees, support vector machines)
- Model evaluation and performance metrics

Week 5: Unsupervised Learning

- Clustering algorithms (e.g., K-means, hierarchical clustering)

- Dimensionality reduction techniques

Week 6: Final Project and Deployment

- Guided work on a data science project

- Deployment considerations for data science applications