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| Python for Data Science & Machine Learning Bootcamp: 10-Day |
| Lab Setup Requirements: |
| Jupyter Notebook running and configured.  Install Pandas, NumPy, Matplotlib, Seaborn, scikit-learn, streamlit libraries. |
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| Prerequisite: |
| • Basic knowledge of programming concepts. |
| • Familiarity with any programming language is a plus. |
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| Day 1: Introduction to the IDE and Python |
| 1. Welcome to Python for Data Science & ML Bootcamp |
| 2. Python: A Brief Overview |
| 3. The Python Installation Procedure |
| 4. Handling Directories in Jupyter Notebook |
| 5. Input & Output |
| 6. Working with different datatypes |
| 7. Variables |
| 8. Arithmetic Operators, Comparison Operators, Logical Operators |
| Day 2: Python Basics and Sequences |
| 1. Conditional statements |
| 2. Loops |
| 3. Sequences Part 1: Lists |
| 4. Sequences Part 2: Dictionaries |
| 5. Sequences Part 3: Tuples |
| 6. Functions Part 1: Built-in Functions |
| 7. Functions Part 2: User-defined Functions, Lambda Functions |
| 8. Library Importing |
| 9. Overview of Must-Have Python Data Science Libraries |
| Day 3: Exploring Data Science Libraries |
| 1. Pandas: A Data Science Library |
| 2. NumPy: A Data Science Library |
| 3. NumPy vs. Pandas |
| 4. Matplotlib Library for Data Science |
| 5. Seaborn Library for Data Science |
| 6. Practical Exercises with Data Science Libraries |
| Day 4: Data Cleaning Techniques and Exploratory Data Analysis |
| 1. Introduction to Data Cleaning |
| 2. Quality of Data |
| 3. Dealing with missing values |
| 4. Statistics Features: Mean, median, mode |
| 5. Feature Scaling |
| 6. Hands-on Data Cleaning Exercises |
| 7. What is Exploratory Data Analysis? |
| 8. Univariate Analysis |
| 9. Bivariate analysis |
| 10. Detecting Outliers |
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| Day 5: Machine Learning Fundamentals |
| 1. Why do we need machine learning? |
| 2. Machine Learning Use Cases |
| 3. Approaches to Machine Learning |
| 4. What is Supervised learning? |
| 5. What is Unsupervised learning? |
| 6. Supervised learning vs unsupervised learning |
| 7. Introduction to regression and How Does Linear Regression Work? |
| 8. Mathematical Working and Geometric Intuition |
| 9. Implementation in python |
| Day 6: Classification |
| 1. Understanding Classification Supervised Learning |
| 2. Exploring the dataset |
| 3. K Nearest Neighbors algorithm |
| 4. Geometric Intuition, Mathematical Working |
| 5. Training the model on the Training set, Predicting the Test Set results |
| 6. Evaluating the performance of the classification model |
| Day 7: End to End Case Study on Regression  1. Exploring the dataset |
| 2. Feature Extraction and Feature Engineering  3. EDA and Data Cleaning on the dataset  4. One Hot Encoding vs Ordinal Encoding  5. Train test split  Day 8: Case Study(continued)  6. Column Transformer Module in sklearn  7. Pipeline in sklearn  8. Model Training and Prediction  9. Comparing Evaluation Technique for different algorithms  10. Deployment on model on streamlit as a webapp |
| Day 9: Introduction to clustering and recommender systems |
| 1. K-Means Clustering  2. Geometrical Intuition and Mathematical Understanding  3. Implementation on Python  4. Insights from the graphical representation  5. Recommenders and types of recommenders  6. Exploring the Dataset  7. Preparation and Cleaning of Dataset  Day 10: Recommender System(continued) |
| 1. Model Training and Evaluation  2. Deployment of the trained ML model using streamlit |
| 3. NLP Basics  4. Q & A and doubt clearing |