

MACHINE LEARNING LABORATORY CYCLE

Python Programs Cycle

1. Decision-Making and Looping

Problem: Write a Python program to find whether a given year is a leap year or not using if-elif-else. Display all leap years between a user-given range using a for loop.

2. User-Defined Functions

Problem: Create a Python function named calculate_area to compute the area of different shapes (circle, rectangle, triangle) based on user input.

3. Recursion

Problem: Write a recursive Python program to calculate the factorial of a number and another program to generate the Fibonacci sequence up to n terms.

4. String, Tuple, List, Dictionary, Set Operations

Problem: Take a string from the user and perform concatenation, slicing, and formatting. Demonstrate tuple unpacking and list slicing. Perform dictionary operations: add, delete, and update key-value pairs. Show set operations: union, intersection, and difference.

5. Exception Handling

Problem: Write a Python program that takes two integers and performs division. Handle exceptions for: Division by zero & Invalid input type

6. Inheritance

Problem: Create a base class Person with attributes name and age. Derive a class Student that adds an attribute mark and a method to display student details. Demonstrate single and multiple inheritance.

7. GUI Programming with Tkinter

Problem: Build a simple calculator GUI using Tkinter with: Buttons for numbers and operators, Entry widget to display inputs and results and handling arithmetic operations

8. NumPy for Numerical Computations

Problem: Create a NumPy array and perform operations such as reshaping, slicing, matrix multiplication. Calculate mean, median, variance, and standard deviation.

9. Database Programming

Problem: Using Python's SQLite Create a database with a Student table (RollNo, Name, Marks). Insert 5 records and write queries to display all records, update a student's marks and delete a record based on RollNo.

10. File Handling

Problem: Write a Python program that reads data from a text file, counts the number of lines, words, and characters and writes the summary to another file.



Machine Learning Algorithms Cycle

11. SVM Classification

Problem: Load the Iris dataset. Implement Support Vector Machine classification using scikit-learn and print the classification accuracy.

12. Random Forest Classifier

Problem: Use any classification dataset to implement Random Forest Classifier to predict and print the model accuracy.

13. Decision Tree

Problem: Use a dataset (e.g., Play Tennis, Student Performance). Build a Decision Tree classifier using entropy/gini index. Visualize the tree structure using graph or plot_tree.

14. KNN Classifier

Problem: Implement K-Nearest Neighbors to classify and evaluate accuracy for different values of k.

15. K-Means Clustering

Problem: Apply K-Means clustering on a dataset (e.g., Mall Customers dataset). Find the optimal number of clusters using the Elbow method. Visualize the clusters.