LABORATORY PRACTICE- III

PRATICE PROBLEM STATEMENT

Group A

1. Write a C++/Java/Python program non-recursive and recursive program to calculate Fibonacci numbers and analyze their time and space complexity.
2. Write a C++/Java/Python program to solve a fractional Knapsack problem using a greedy method.
3. Write a C++/Java/Python program to solve a 0-1 Knapsack problem using dynamic programming.
4. Write a program to implement Huffman Encoding using a greedy strategy.
5. Design n-Queens matrix having first Queen placed. Use backtracking to place remaining Queens to generate the final n-queen's matrix.

Group B

1. Implement K-Means clustering on sales_data_sample.csv dataset. Determine the number of clusters using the elbow method.
   Dataset link : https://www.kaggle.com/datasets/kyanyoga/sample-sales-data
2. Implement Gradient Descent Algorithm to find the local minima of a function. For example, find the local minima of the function y=(x+3)2 starting from the point x=2.
3. Implement K-Nearest Neighbors algorithm on diabetes.csv dataset. Compute confusion matrix, accuracy, error rate, precision and recall on the given dataset. Dataset link: https://www.kaggle.com/datasets/abdallamahgoub/diabetes
4. Classify the email using the binary classification method. Email Spam detection has two states: a) Normal State – Not Spam, b) Abnormal State – Spam. Use K-Nearest Neighbors for classification. Analyze their performance.
   Dataset link: The emails.csv dataset on the Kaggle
   https://www.kaggle.com/datasets/balaka18/email-spam-classification-dataset-csv

5. Classify the email using the binary classification method. Email Spam detection has two states: a) Normal State – Not Spam, b) Abnormal State – Spam. Use Support Vector Machine for classification. Analyze their performance.
   Dataset link: The emails.csv dataset on the Kaggle
   https://www.kaggle.com/datasets/balaka18/email-spam-classification-dataset-csv

6. A) Predict the price of the Uber ride from a given pickup point to the agreed drop-off location using linear regression model.
   B) Pre-process the dataset.
   C) Check the correlation
   B) Evaluate the models and compare their respective scores like R2, RMSE, etc.

   Dataset link: https://www.kaggle.com/datasets/yasserh/uber-fares-dataset

Group C

1. Installation of MetaMask and study of spending Ether per transaction.
2. Create your own wallet using Metamask for crypto transactions.
3. Write a smart contract on a test network, for Bank account of a customer for following operations:
   - Deposit money
   - Withdraw Money
   - Show balance
4. Write a program in solidity to create Student data. Use the following constructs:
   - Structures
   - Arrays
   - Fallback

   Deploy this as smart contract on Ethereum and Observe the transaction fee and Gas values.