Subject: Laboratory Practice III (410246) Assignment List

DAA 1.	Write a program non-recursive and recursive program to calculate Fibonacci numbers and analyze the time and space complexity.
DAA 2.	Write a program to implement Huffman Encoding using a greedy strategy.
DAA 3.	Write a program to solve a 0-1 Knapsack problem using dynamic programming or branch and bound strategy.
DAA 4.	Design n-Queens matrix having first Queen placed. Use backtracking to place remaining Queens to generate the final n-queen
DAA 5.	Write a program for analysis of quick sort by using deterministic and randomized variant.
ML 1	Predict the price of the Uber ride from a given pickup point to the agreed drop-off location. Perform following tasks: 1. Pre-process the dataset. 2. Identify outliers. 3. Check the correlation. 4. Implement linear regression and random forest regression models. Evaluate the models and compare the irrespective scores like R2, RMSE, etc.
ML 2	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 and Support Vector Machine for classification. Analyze the performance.
ML 3	Given a bank customer, build an neural network-based classifier that can determine whether they will leave or not in the next 6 months. Dataset Description: The case study is from an open-source data set from Kaggle. The dataset contains 10,000 sample points with 14 distinct features such as Customer Id, Credit Score, Geography, Gender, Age, Tenure, Balance etc. Perform following steps: 1. Read the dataset. 2. Distinguish the feature and target set and divide the dataset into training and test sets. 3. Normalize the train and test data. 4. Initialize and build the model. Identify the points of improvement and implement the same. 5. Print the accuracy score and confusion matrix (5points).

ML 4	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 $x=2$
ML 5	Implement K-Means clustering/hierarchical clustering on sales_data_sample.csv dataset. Determine the number of clusters using the elbow method.
BT 1.	Write a smart contract on a test network, for Bank account of a customer for following operations: • Deposit money • Withdraw Money • Show balance
BT 2.	Write a program in solidity to create Student data. Use the following constructs: • Structures • Arrays Deploy this as smart contract on Ethereum and Observe the transaction fee and Gas values.

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