Design and Analysis of Algorithms

1. Write a program to calculate Fibonacci numbers and find its step count

2. Implement job sequencing with deadlines using a greedy method

3. Write a program to solve a fractional Knapsack problem using a greedy method

4. Write a program to generate binomial coefficients using dynamic programming.

5. Mini Project :- Implement merge sort and multithreaded merge sort. Compare time required by both the algorithms. Also analyze the performance of each algorithm for the best case and the worst case

Machine Learning

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.
    5. Evaluate the models and compare their respective scores like R2, RMSE, etc.

2. Classify the email using the binary classification method. Analyze their performance. a) Normal State – Not Spam b) Abnormal State – Spam. Use K-Nearest Neighbors and Support Vector Machine for classification.

3. Given a bank customer, build a neural network-based classifier that can determine whether they will leave or not in the next 6 months.
    1. Read the dataset.
    2. Distinguish the feature and target set and divide the data set 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 (5 points).

4. Implement K-Nearest Neighbors algorithm on diabetes.csv dataset. Compute confusion matrix, accuracy, error rate, precision and recall on the given dataset.

5. Mini-Project :- Build a machine learning model that predicts the type of people who survived the Titanic shipwreck using passenger data (i.e. name, age, gender, socio-economic class, etc.).

Blockchain Technology

1. Installation of Metamask and study 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

5. Mini Project:- Create a dApp (de-centralized app) for e-voting system