From Kaggle: https://www.kaggle.com/datasets/blastchar/telco-customer-churn

Project Task: Predicting Customer Churn in a Telecommunications Company

Objective: The objective of this project is to build a predictive model that can accurately predict customer churn in a telecommunications company. By using machine learning techniques, you aim to identify customers who are likely to churn, allowing the company to take proactive measures to retain them.

Requirements:

1. Python programming language
2. Machine learning libraries (e.g., scikit-learn, TensorFlow, Keras)
3. Telecommunications customer dataset (including features such as customer demographics, services subscribed, usage patterns, etc.)
4. Clustering, decision tree, regression analysis, logistic regression, neural networks, recurrent neural networks, convolutional neural networks.

Steps:

1. Data Preparation:
    - Import the necessary libraries and load the telecommunications customer dataset.
    - Perform exploratory data analysis (EDA) to understand the dataset, identify missing values, and handle them appropriately.
    - Preprocess the data by encoding categorical variables, scaling numerical variables, and splitting the dataset into training and testing sets.
2. Feature Selection and Engineering:
    - Identify relevant features that may influence customer churn. Use domain knowledge and techniques such as correlation analysis to select the most informative features.
    - Perform feature engineering if needed, creating new features that capture meaningful information from the existing data.
3. Model Building and Evaluation:
    - Train and evaluate multiple machine learning models using the concepts you've covered in your course, including clustering, decision tree, regression analysis, logistic regression, neural networks, recurrent neural networks, and convolutional neural networks.
    - Compare the performance of different models using appropriate evaluation metrics, such as accuracy.
    - Select the best-performing model based on evaluation results.
4. Hyperparameter Tuning:

- Fine-tune the hyperparameters of the selected model to improve its performance. Use techniques such as grid search, random search, or Bayesian optimization to find the optimal hyperparameter settings.

5. Model Interpretation:
    - Interpret the selected model to gain insights into the factors contributing to customer churn. Analyze feature importance, coefficients, or activation maps to understand the model's decision-making process.
6. Deployment and Reporting:
    - Deploy the final model on new data to make predictions on unseen customer records.
    - Prepare a comprehensive project report summarizing the problem statement, data preprocessing steps, model building process, evaluation results, insights gained, and recommendations for the telecommunications company.