**Project: Predictive Customer Churn Analysis**

Description:

Create a predictive model to identify customers who are likely to churn (cancel their subscription or stop using a service). This project involves multiple steps and allows you to showcase a variety of skills:

**Data Collection:**

* Gather historical customer data, including usage patterns, demographics, and customer support interactions.

**Data Cleaning and Exploration:**

* Clean the dataset by handling missing values, outliers, and duplicates.
* Perform exploratory data analysis (EDA) to gain insights into the features and their relationships.

**Feature Engineering:**

* Create new features that might be relevant for predicting churn. This could involve transforming existing features or combining them in meaningful ways.

**Data Preprocessing:**

* Encode categorical variables, scale numerical features, and split the data into training and testing sets.

**Model Selection and Training:**

* Experiment with different machine learning models (e.g., logistic regression, decision trees, random forests, or gradient boosting) to predict customer churn.
* Tune hyperparameters to improve model performance.

**Model Evaluation:**

* Evaluate the model's performance using metrics such as accuracy, precision, recall, and F1 score.
* Use techniques like cross-validation to ensure the model's robustness.

**Interpretation and Insights:**

* Interpret the results to understand which features are most influential in predicting churn.
* Provide actionable insights for the business based on the model's findings.

**Visualization and Reporting:**

* Create visualizations (e.g., ROC curves, confusion matrices) to effectively communicate the model's performance.
* Build a report or a dashboard summarizing the key findings and recommendations.