**Project Plan: Customer Churn Predictor for Subscription Businesses**

**🎯 Objective**

Predict whether a customer will churn (stop using the service) based on historical usage, interaction, and demographic data.

**🛠️ Tech Stack**

| **Layer** | **Tools** |
| --- | --- |
| Model | Logistic Regression, Random Forest, XGBoost, LightGBM |
| Language | Python |
| Deployment | Flask or FastAPI → GCP Cloud Run / App Engine |
| Visualization | Streamlit / Power BI (optional) |
| Dataset | Kaggle Telecom/Subscription Dataset or synthetic |

**🗂️ Suggested Project Structure**

cpp

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churn-predictor/

├── data/

│ └── churn\_dataset.csv

├── notebooks/

│ └── eda\_model\_building.ipynb

├── app/

│ ├── main.py (Flask or FastAPI app)

│ ├── model.pkl

│ └── requirements.txt

├── streamlit\_app/

│ └── app.py (optional frontend)

├── README.md

├── churn\_model.ipynb

└── deploy/

└── Dockerfile (for GCP Cloud Run)

**✅ Project Phases**

**📊 Phase 1: Data & EDA**

* Load data (e.g., gender, tenure, usage\_time, support\_calls, contract\_type, churned)
* Perform:
  + Missing value treatment
  + Encoding categorical variables
  + Feature scaling

**🧠 Phase 2: Model Building**

* Train-test split
* Try:
  + Logistic Regression
  + XGBoost / LightGBM
* Evaluate using accuracy, ROC AUC, confusion matrix
* Save model using joblib

**🌐 Phase 3: Deployment**

* Build an API endpoint with Flask or FastAPI:
  + /predict endpoint that takes input JSON
  + Returns churn probability (e.g., "Customer will churn with 78% probability")
* Deploy to **GCP Cloud Run**

**📈 Phase 4 (Optional): Frontend**

* Build a Streamlit UI:
  + User inputs customer features
  + Backend calls API and displays prediction
  + Show model insights or SHAP plot

**🔗 Bonus Ideas**

* Add a feature importance dashboard
* Add churn prevention suggestions (“Send a discount offer”)
* Email automation trigger (for bonus deployment)

Would you like me to generate:

* Sample dataset + EDA notebook?
* Flask API boilerplate?
* GCP deployment guide?