Portfolio Data Science & Machine Learning Projects

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Turning Data into Insights & Predictions

1 Customer Churn Prediction for Telecom Company

Short Description:
This project develops a machine learning model to predict customer churn in the telecommunications industry. Using a calibrated Logistic Regression model and engineered features, it identifies at-risk customers to enable proactive retention strategies. The solution, deployed as a Streamlit application, achieved a recall of 0.84 and a net savings of $27,040 for a sample of 1,409 customers.

Tech Stack:
Python, Scikit-learn, Streamlit, Optuna, SHAP, Matplotlib

2 Customer Segmentation Dashboard

Short Description:
This dashboard segments customers using RFM (Recency, Frequency, Monetary) analysis to help a business understand customer behavior, improve marketing efforts, and boost retention. It monitors key performance indicators (KPIs) like total customers (4,338), total revenue ($8,911,407.90), and average order value ($480.87). The project also highlights top revenue contributors and monthly revenue trends.

Tech Stack:
Python, Dash, Pandas, Matplotlib, Seaborn

3 Spam Detection System

Short Description:
This project is a robust SMS/Email Spam Detection system. It uses advanced Natural Language Processing (NLP) techniques and a Bernoulli classifier for real-time predictions. The final model achieved a high accuracy of 98.45% and a precision of 98%, ensuring that almost no legitimate messages are incorrectly flagged as spam.

Tech Stack:
Python, Scikit-learn, NLTK, Streamlit, Optuna

4 Skills & Tools

- **Languages:** Python, SQL

- **Machine Learning:** Scikit-learn, XGBoost, LightGBM, Random Forest, Logistic Regression
- **Data Analysis:** Pandas, NumPy
- **Visualization:** Matplotlib, Seaborn, Dash, Streamlit
- **NLP:** NLTK, TF-IDF
- **Hyperparameter Tuning:** Optuna, GridSearchCV

5 Certificates

- Data Analysis with Python IBM
- Data Visualization with Python IBM
- Databases and SQL for Data Science with Python IBM
- Python for Data Science, AI and Development IBM
- Supervised Machine Learning: Regression and Classification DeepLearning.AI
- Natural Language Processing with Classification and Vector Spaces DeepLearning.AI
- Crash Course on Python Google
- The Data Scientists Toolbox Johns Hopkins University