Entry-Level Machine Learning Engineer Portfolio Projects

Core Machine Learning Projects

- Movie Recommendation System

  - Skills: Collaborative filtering, matrix factorization, data wrangling

  - Stack: Python, Pandas, Scikit-learn, Surprise or LightFM

  - Bonus: Deploy with Streamlit or Flask

- Used Car Price Prediction

  - Skills: Regression, feature engineering, outlier handling

  - Stack: Python, Scikit-learn, Pandas, NumPy

  - Bonus: Host as an API and serve predictions

- Fake News Detection

  - Skills: NLP, text preprocessing, TF-IDF, logistic regression

  - Stack: Python, Scikit-learn, NLTK or SpaCy

  - Bonus: Add explainability with LIME or SHAP

- Customer Segmentation

  - Skills: Clustering (KMeans, DBSCAN), PCA

  - Stack: Python, Pandas, Matplotlib, Seaborn

  - Bonus: Use real-world datasets like Mall Customers or E-Commerce logs

- Handwritten Digit Recognition (MNIST)

  - Skills: Neural networks, CNNs

  - Stack: TensorFlow or PyTorch

  - Bonus: Create a simple web app that classifies drawn digits

Real-World Simulation Projects

- Loan Eligibility Prediction

- Skills: Classification, dealing with imbalanced data (SMOTE), model evaluation

- Stack: Python, Scikit-learn, XGBoost

- Bonus: Add explainable ML to show why a loan was rejected

- Time Series Forecasting Stock or Energy Prices

  - Skills: ARIMA, LSTM, feature windowing

  - Stack: Python, statsmodels, Keras/TensorFlow

  - Bonus: Visualize predictions with Plotly

- Real-time Object Detection

  - Skills: Computer vision, YOLO or MobileNet

  - Stack: Python, OpenCV, TensorFlow Lite

  - Bonus: Run on webcam or Raspberry Pi

Capstone-Level Portfolio Projects

- AI Resume Screener

  - Skills: NLP + classification (good/bad resume), keyword extraction

  - Stack: Python, HuggingFace Transformers

  - Bonus: Use Streamlit to create a frontend

- ML-Powered Personal Finance Tracker

  - Skills: Text classification (labeling expenses), clustering

  - Stack: Python, FastAPI, SQLite

  - Bonus: Create a full-stack version with a simple dashboard

Tips to Stand Out

Use GitHub: Include clean code, README, and visualizations.

Include Metrics: Always report accuracy, F1, confusion matrix, etc.

Deploy at least one project: Use Streamlit, HuggingFace Spaces, or Render.

Write a blog post for at least 12 projects to explain your thought process.