

Credit Default Predictor - Local MLOps Project

Welcome to the Credit Default MLOps Lab!

This project demonstrates a full local MLOps pipeline using MLflow and Streamlit.

Project Objectives

- Install MLflow and set up a local tracking server
 - Train two ML models (April and May datasets)
 - Track model experiments with MLflow
 - Serve models with MLflow Models Server
 - Test predictions with a Streamlit UI
-

Project Structure

```
api/  
data/  
raw/  
april_credit_data.csv  
may_credit_data.csv  
training/  
train.py  
ui/  
streamlit_app.py  
Makefile  
requirements.txt  
README.md
```

Quick Setup

1. Clone the repository:

```
git clone https://github.com/YOUR_USERNAME/credit-default-predictor.git  
cd credit-default-predictor
```

2. Install Python 3.11 (recommend using pyenv):

```
pyenv install 3.11.4  
pyenv global 3.11.4
```

3. Install required Python packages:

pip install -r requirements.txt

4. Create local mlruns folder manually:

```
mkdir -p ~/mlruns
```

5. Start MLflow Tracking Server:

mlflow server

--backend-store-uri sqlite:///mlflow.db

--default-artifact-root ~/mlruns

--host 0.0.0.0

--port 5000

✅ This initializes mlflow.db and creates the required tables (experiments, runs, etc.).

6. Verify Checks:

- Confirm ~/mlruns exists:

```
ls ~/mlruns
```

- Confirm mlflow.db exists in your project directory:

```
ls mlflow.db
```

✅ If these exist, you're ready to train models.

Commands Cheat Sheet

Task Command

Start MLflow Tracking Server `mlflow server --backend-store-uri sqlite:///mlflow.db --default-artifact-root ~/mlruns --host 0.0.0.0 --port 5000`

Train April Model `python training/train.py api/data/raw/april_credit_data.csv`

Train May Model `python training/train.py api/data/raw/may_credit_data.csv`

Serve Model Manually `mlflow models serve -m`

`/home/ubuntu/mlruns/1/<run_id>/artifacts/credit_defaults_model_ -p 5001`

Launch Streamlit App `streamlit run ui/streamlit_app.py`

When serving, make sure you point to the `credit_defaults_model_` folder which contains:

- MLmodel

- model.pkl
- requirements.txt
- conda.yaml

Example after training:

/home/ubuntu/mlruns/1/2a4829d050cb479a9d528d48033d18d0/artifacts/credit_defaults_model_

Architecture Overview

Local Machine

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MLflow Tracking Server (localhost:5000)

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MLflow Model Server (localhost:5001)

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Streamlit Frontend (localhost:8501)

Learning Outcomes

- Model training and logging
- Model versioning and experiment tracking
- Serving models automatically
- UI connection for predictions

License

This project is licensed under the MIT License.

✨ Happy Predicting MLOps!