# IBM-Project-44943-1660727551

Crude Oil Price Prediction:

Oil demand is inelastic, therefore the rise in price is good news for producers because they will see an increase in their revenue. Oil importers, however, will experience increased costs of purchasing oil. Because oil is the largest traded commodity, the effects are quite significant. A rising oil price can even shift economic/political power from oil importers to oil exporters. The crude oil price movements are subject to diverse influencing factors.

This Project mainly focuses on applying Neural Networks to predict the Crude Oil Price. This decision helps us to buy crude oil at the proper time. Time series analysis is the best option for this kind of prediction because we are using the Previous history of crude oil prices to predict future crude oil. So we would be implementing RNN(Recurrent Neural Network) with LSTM(Long Short Term Memory) to achieve the task.

Technical Architecture:
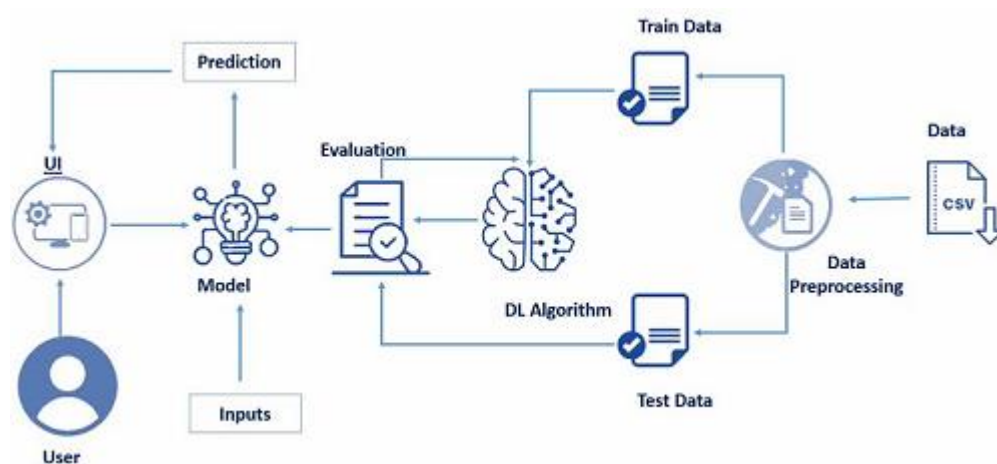
Project Objectives

By the end of this project we will be able to:

1. Know fundamental concepts and techniques of time series forecasting and LSTM
2. Gain a broad understanding of time series data.
3. Know how to split the data for time series forecasting.
4. Know how to build a web application using the Flask framework.

Project Flow

To accomplish this, we have to complete all the activities and tasks listed below

1.Data Collection.

2.Collect the dataset or Create the dataset

3.Data Preprocessing.

4.Import the Libraries.

5.Importing the dataset.

6.Analyze the data

7.Taking care of Missing Data

8.Feature Scaling

9.Data Visualization

10.Splitting Data into Train and Test.

11.Creating a dataset with a sliding window.

12.Model Building

13.Import the model building Libraries

14.Initializing the model

Pre-Requisites

Anaconda Navigator :

Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS. Conda is an open-source, cross-platform, package management system. Anaconda comes with so very nice tools like JupyterLab, Jupyter Notebook, QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we will be using Jupiter notebook and spyder.

Tensor flow:

TensorFlow is an end-to-end open-source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries, and community resources that lets researchers push the state-of-the-art in ML and developers can easily build and deploy ML-powered applications.

Keras:

Keras leverages various optimization techniques to make high-level neural network API easier and more performant. It supports the following features:

1.Consistent, simple, and extensible API.

2.Minimal structure - easy to achieve the result without any frills.

3.It supports multiple platforms and backends.

4.It is a user-friendly framework that runs on both CPU and GPU.

5.Highly scalability of computation.
Flask:
Web framework used for building Web applications

Prior Knowledge:

1.Supervised and unsupervised learning.

2.Regression Classification and Clustering.

3.Artificial Neural Networks.

4.Flask.

Project Structure

- 📁 dataset
  - 📄 Crude Oil Prices Daily.xlsx
- 📁 Flask
  - 📁 static
    - 📁 css
      - 🖼 input.png
      - 🖼 logo.png
      - </> main.css
      - 🖼 output.png
      - </> style.css
      - 🖼 user_interface.png
    - 📁 js
      - 🐍 js.py
  - 📁 templates
    - </> index.html
    - </> web.html
  - 🐍 app.py
  - crude_oil.h5
- 📁 output video
  - output_video.mp4
- 📁 Training
  - Crudeoil_price_prediction_using_LSTM.ipynb
- 📄 Crude_oil_price_prediction.docx
- 📄 requirements.txt