

FORECASTING BRENT CRUDE OIL PRICES USING XGBOOST



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AGENDA

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Introduction

Brent crude oil is a benchmark used to price two-thirds of the world's oil, including oils exported from the North Sea, Europe, and West Africa. It is considered a key global benchmark due to its widespread use in pricing a significant portion of the world's oil.

Understanding and accurately forecasting the price of Brent crude oil is essential for organizations in the oil industry, as well as for oil-producing countries that depend on this commodity for their economic stability. By providing insight into the future price trends of Brent crude oil, stakeholders in the oil industry can make informed decisions about production, investment, and risk management.



PROBLEM STATEMENT & PURPOSE OF PROJECT

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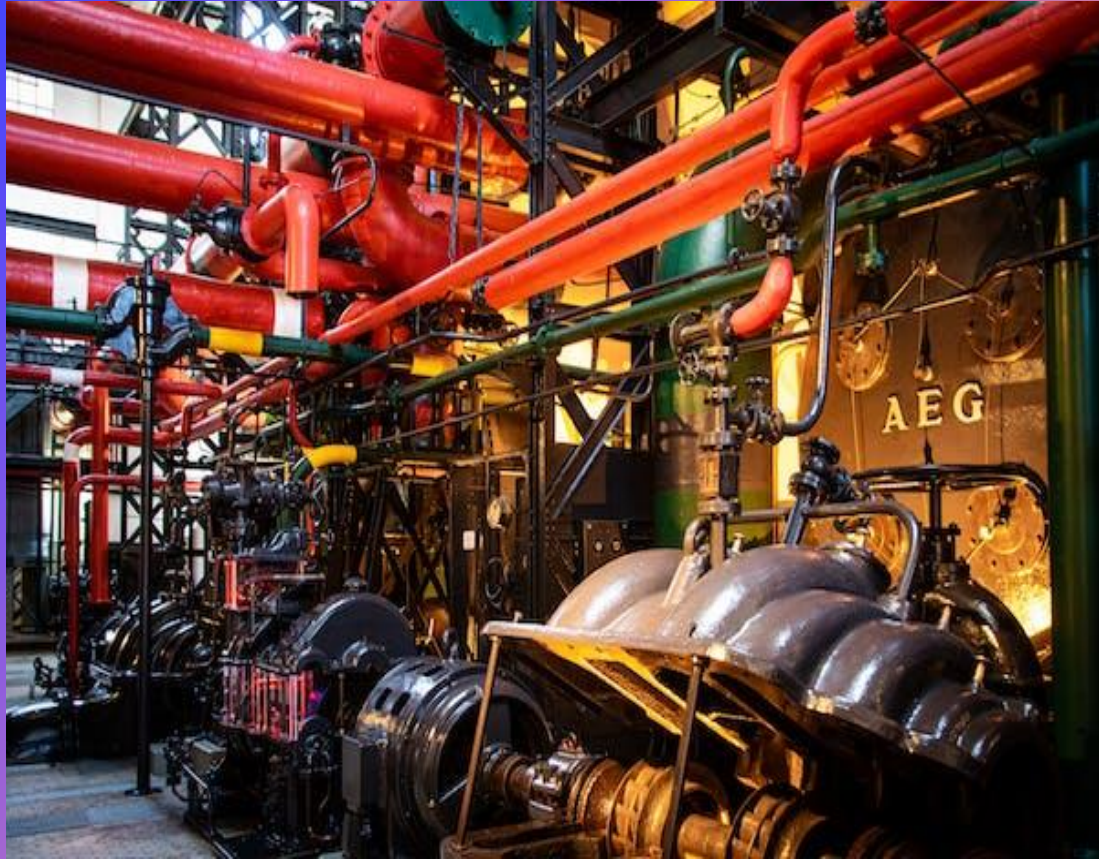
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Problem Statement

Despite its importance, the crude oil market is often subject to sudden and unpredictable price changes due to a range of factors, including geopolitical conflicts and natural disasters. Accurately forecasting the price of Brent crude oil is challenging, but crucial for organizations in the oil industry and oil-producing countries to make informed decisions.

Purpose of the Project

The purpose of this project is to develop a machine learning model using Xgboost that can accurately forecast the Brent crude oil prices. By using Xgboost to analyze and predict Brent crude oil prices, this project aims to provide a valuable tool for organizations in the oil industry to better understand and predict the price of a benchmark that is used to price two-thirds of the world's oil.



Data and Methodology

Forecasting Brent Crude Oil Prices with Xgboost: A Machine Learning Approach"

Data

The dataset used for this project consists of daily Brent crude oil prices from 2000-01-04 to 2022-09-02. The data includes the date, open price, high price, low price, close price, volume, and currency. The data was collected from a reliable source and does not contain any missing or irrelevant values.

Methodology

The following methods were used to develop the forecasting model:

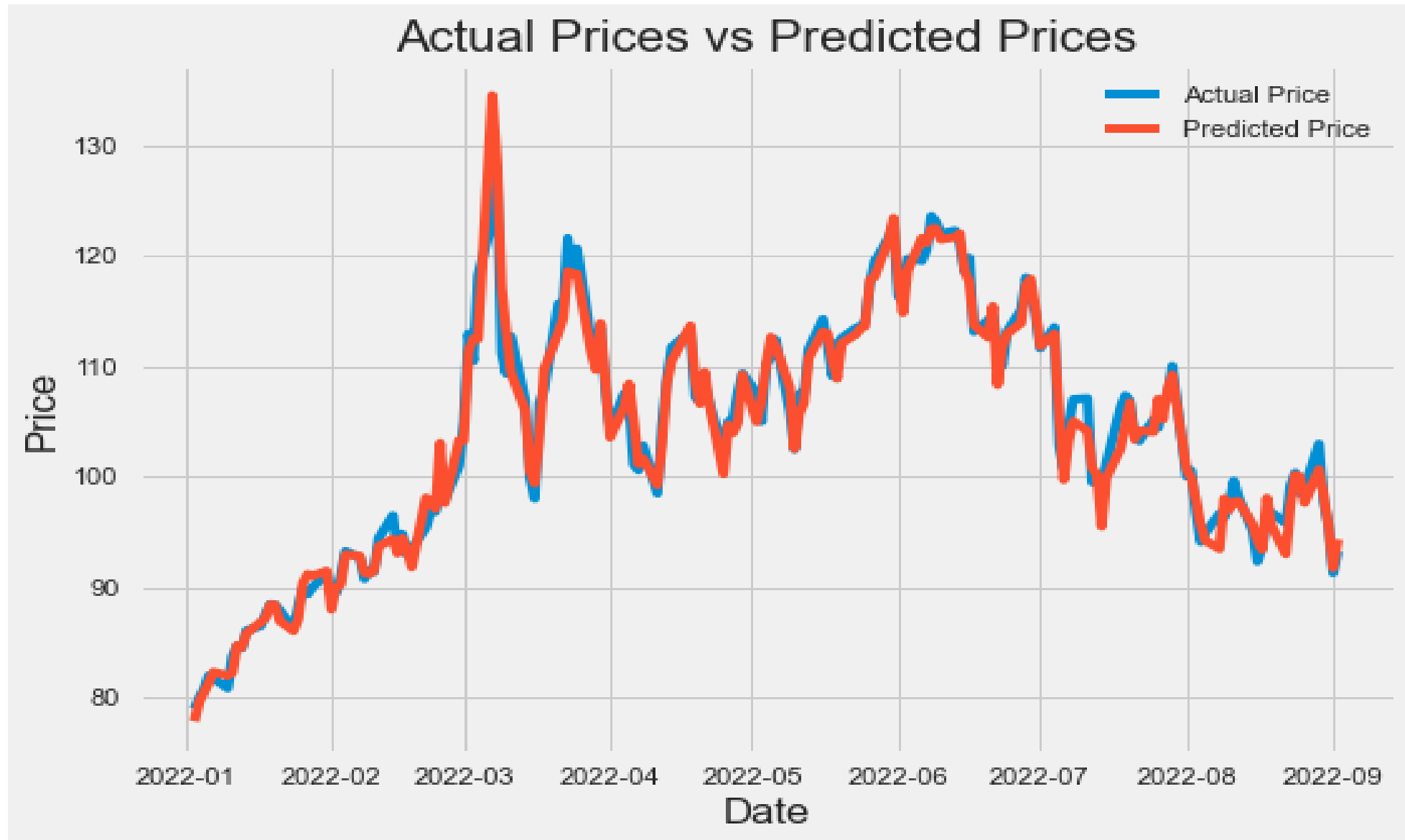
- Data preprocessing
- Train-Test split
- Model training using Xgboost and hyperparameter optimization
- Model evaluation using Mean Squared Error (MSE)
- Model prediction on the testing set

By using Xgboost and a systematic approach to data preprocessing, model training, and evaluation, this project aims to produce a well-performing model for forecasting Brent crude oil prices.

Results and Evaluation

The Xgboost model was able to accurately forecast Brent crude oil prices closely with a low Mean Squared Error (MSE) score. The model performed well on the testing set, with a MSE score that was similar to that of the training set, indicating that the model is not overfitting. The predicted values were in line with the actual values, demonstrating that the model is a good fit for the data.

Results and Evaluation





Conclusion and Future Work

In conclusion, Xgboost was able to produce a well-performing model for forecasting Brent crude oil prices. The model was able to accurately forecast the prices with a low MSE score, and its performance was consistent on both the training and testing sets. This project provides a valuable tool for organisations in the oil industry to better understand and predict the prices of Brent crude oil, which is a critical benchmark used to price a significant portion of the world's oil.

Future work could involve exploring other machine learning algorithms and techniques to improve the model's performance and accuracy. Additionally, incorporating other factors that may impact Brent crude oil prices, such as geopolitical events and natural disasters, could also be valuable.

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THANK YOU

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