Project Objectives

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Team ID	PNT2022TMID33226
Project Name	Project- crude oil price prediction

Know fundamental concepts and techniques of time series forecasting and LSTM:

The Long Short-Term Memory recurrent neural network has the promise of learning long sequences of observations.It seems a perfect match for time series forecasting, and in fact, it may be.In this , you will discover how to develop an LSTM forecast model for a one-step univariate time series forecasting problem. LSTM stands for Long short-term memory. **LSTM cells are used in recurrent neural networks that learn to predict the future from sequences of variable lengths**. Note that recurrent neural networks work with any kind of sequential data and, unlike ARIMA and Prophet, are not restricted to time series.

Gain a broad understanding of time series data:

Time-series data is a collection of data points over a set period. Time-series analysis is a method of analyzing data to extract useful statistical information and characteristics. One of the study's main goals is to predict future value. When forecasting with time series analysis, which is extremely complex, extrapolation is required. However, the forecasted value and the associated uncertainty estimation can make the result extremely valuable.Time-series analysis is a method of analyzing a collection of data points over a period of time. Instead of recording data points intermittently or randomly, time series analysts record data points at consistent intervals over a set period of time.While time-series data is information gathered over time, various types of information describe how and when that information was gathered. For example:Time series data: It is a collection of observations on the values that a variable takes at various points in time.Cross-sectional data: Data from one or more variables that were collected simultaneously.Pooled data: It is a combination of cross-sectional and time-series data.The variable varies according to the probability distribution, showing which value Y can take and with which probability those values are taken.

Yt = μt + εt

Each instance of Yt is the result of the signal μtεt is the noise term here.

Know how to split the data for time series forecasting:

Train/test splits in time series: For example, if you had 144 records at monthly intervals (12 years), a good approach would be to **keep the first 120 records (10 years) for training and the last 24**

records (2 years) for testing. And that's all there is to train/test splits. **Provides train/test indices to split time series data samples that are observed at fixed time intervals, in train/test sets**. In each split, test indices must be higher than before, and thus shuffling in cross validator is inappropriate. This cross-validation object is a variation of KFold . SPlit is based on the method of **support points (SP)**, which was initially developed for finding the optimal representative points of a continuous distribution. We adapt SP for subsampling from a dataset using a sequential nearest neighbor algorithm. A commonly used ratio is **80:20**, which means 80% of the data is for training and 20% for testing. Other ratios such as 70:30, 60:40, and even 50:50 are also used in practice. There does not seem to be clear guidance on what ratio is best or optimal for a given dataset. The simplest way to split the modelling dataset into training and testing sets is to **assign 2/3 data points to the former and the remaining one-third to the latter**. Therefore, we train the model using the training set and then apply the model to the test set. In this way, we can evaluate the performance of our model.

Know how to build a web application using the Flask framework.

- Step 1 — Installing Flask. ...
- Step 2 — Creating a Base Application. ...
- Step 3 — Using HTML templates. ...
- Step 4 — Setting up the Database. ...
- Step 5 — Displaying All Posts. ...
- Step 6 — Displaying a Single Post.

Deploying the Flask Web Server

Creating a text file for a list of app dependencies.
Getting your API Endpoint URL.
Logging in to the Cloud Foundry CLI.
Deploying Application to Cloud Foundry.
Displaying Applications.
Creating a Custom Domain.
Creating a Custom Route.
Mapping Route to App.

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.

Building Your Own Python Web Framework

Part 1. Changelog. WSGI. Requests and Routing. Duplicate Routes and Class Based Handlers. Unit Tests and Test Client. Django-like Routes and Templates. ...

Part 2. Introduction. Database and Table Creation. Instances and Rows. Select Queries. Update and Delete Queries. PyPI, Web App, Deployment.