CRUDE OIL PRICE PREDICTION

A PROJECT REPORT

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BRANCH OF STUDY: B.TECH INFORMATION TECHNOLOGY

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ANNA UNIVERSITY: CHENNAI 600025

Certified that this project report "CRUDE OIL PRICE PREDICTION" is the bonafide work of "KOWSALYA P ,SHALINI S ,SOMALAKSHMI S, SOWMIYA K " who carried out the project work under my supervision.

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CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

Crude oil is the world's most leading fuel. The main advantages of crude oil are it has high density, it is easily available. Oil is used in almost all the industries. Oil is a Constant Power Source. Oil energy is very reliable when compared to other sources such as solar and wind energy. Some machine learning models fit the data set efficiently depending upon the type of data points provided. The main aim of this project is to find the different models that efficiently fit the data points and predict the price of fuel with the help of machine learning models. This project works on comparing the different supervised learning models and brings a conclusion based on the efficiency. We have used 3 supervised learning models namely, Random Forest Regression, Linear Regression and DecisionTreeRegression to know which gives the best in terms of accuracy and performance. These algorithms give a numeric value as output. So we can compare the output of these models with the actual models. Now-a-days the oil price has been increasing in leaps and bounds due to certain reasons like inflation throughout the world. Hence these are derived or extracted from petroleum . The sources of crude oil for India come from neighboring countries such as Dubai and Saudi-Arabia. To predict the values of petroleum like p[1]etroleum and Diesel within the future, we've decided to usetheMachine Learning algorithms and apply ensemble learning. Ensemble learning is a technique where we use different algorithms or single algorithms many times. In this way we can compare different algorithms and find the best one for our problem statement.

Crude oil has an essential role in the world, as this is one of the major products worldwide and thus includes global measurements. The origin of crude oil prediction errors involves composite supply-demand structures. Crude oil volatility has a critical effect on economic factors which includes economic increase of the country, unemployment, exchange rate that moreover depends on crude oil export and import. In current days machine learning techniques can be implemented in various applications.

Machine learning gives powerful computational tools and algorithms that are capable of learning itself and predict data with long short-term memory. This paper contains LSTM based recurrent neural networks for the matter of crude oil price prediction. Recurrent neural networks (RNN) identifies nethermost powerful and impact models for processing time-series based sequential data. LSTM variants can be used for other task as well other than prediction Suchasspeech, handwriting and polyphonic modeling. The hyper parameters of variants

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING PROBLEM Survey 1:

Jiayu Yi And Yuxiang Cheng (2019) "Multi-Scale Volatility and External Event Analysis of Crude Oil PricePrediction". crude oil price fluctuations and analyze the impacts of external events, this paper first employs the CEEMD method to decompose the crude oil historical prices into different components and extracts a market fluctuation, a shockfromextreme events, and a long-term trend. And we find that when determining the crude oil prices, the shock from extreme events has become the most important factor. Then we combine the ICSS test with the Chow test to get the structural breaks and analyze extreme event impacts. Finally, considering the interaction between external event impacts and crude oil prices,we establish the models based on VAR, SVM, and structural breaks to predict the crude oil prices, finding that theCEEMD- VAR-SVM model with structural breaks performs best compared to other models we established.

Survey 2:

Lu-Xi Liu AND Ming -Fang Li (2020)

"Google Index-Driven Oil Price Value-at-Risk Forecasting: A Decomposition Ensemble Approach"

The oil price is in fl-fluctuations not only by the fundamentals of supply and demand but also by unpredictable political conflicts, climate emergencies, and investor intentions, which cause enormous short term fl fluctuations in the oil price. The proposition of the Google index-driven decomposition ensemble model to forecast crude oil price risk uses big data technology and a time series decomposition method. First, by constructing an index of investor attention for the

market and emergencies combined with a bi variate empirical mode decomposition, we analyze the impact of investor attention on oil price fl- fluctuations. Second,we establish a vector auto regression model, and the impulse responses define the impact of emergencies on the crude oil price. Finally, with the help of machine learning and historical simulation methods, the risk of crude oil price shocks from unexpected events is predicted. Empirical research demonstrates that concerns related to the oil market and emergencies that appear in Google search data are
closely related to changes in oil prices. Based on the Google index, our model's prediction of crude oil prices is more accurate than other models, and the prediction of value-at-risk is closer to the theoretical value than the historical simulation with the ARMA forecasts method.

Survey 3:

Azubuike H . Amadi , Orisa F. Ebube ,Silas I . Aire (2020)
"Effects of Covid-19 on Crude Oil Price and Future Forecast Using a Model
Application and Machine Learning"

Oil Price has been a benchmark governing the trade of oil and gas globally. It is fixed by producing countries or countries in a consortium through organizations such as Organization of the Petroleum Exporting Countries (OPEC) or a particular mix of crude oil such as the West Texas Intermediate (WTI) or Brent. The spot price and future prices of crude oil is basically determined by demand and supply, however, some external factors can have great influence on oil price. This research work will be emphasizing on the direct and indirect effects of the COVID-19 pandemic as an external factor other than demand and supply on the benchmarks of oil pricing between 2000 and 2020. Having analyzed the various oil price fluctuation which have caused by several factors over the years, this research went further to identify those significant factors, weigh them and input them into a model that will generate simulated oil prices of past, present and future benchmarks with relation to demand, supply, production cost and other external factors. This model was also validated using machine learning algorithms and real data of previous yearly average oil price noting the reasons for each spot price. Significant recommendations were made on the use of this model for fixing oil price benchmarks as variables to each benchmark are numerous.

Survey 4:

Hongli Niu And Yazhi Zhao (2021)
"Crude oil prices and volatility prediction by a hybrid model based on kernel
extreme learning machine"

In view of the important position of crude oil in the national economy and its contribution to various economic sectors, crude oil price and volatility prediction have become an increasingly hot issue that is concerned by practitioners and researchers. In this paper, a new hybrid forecasting model based on variation al
mode decomposition (VMD) and kernel extreme learning machine (KELM) is proposed to forecast the daily prices and 7-day volatility of Brent and WTI crude oil. The KELM has the advantage of less time consuming and lower parameter- sensitivity, thus showing fine prediction ability. The effectiveness of VMD- KELM model is verified by a comparative study with other hybrid models and their single models. Except various commonly used evaluation criteria, a recently-developed multi-scale composite complexity synchronization (MCCS) statistic is also utilized to evaluate the synchrony degree between the predictive and the actual values. The empirical results verify that 1) KELM model holds better performance than ELM and BP in crude oil and volatility forecasting; 2) VMD-based model out performs the EEMD-based model; 3) The developed VMD-KELM model exhibits great superiority compared with other popular models not only for crude oil price, but also for volatility prediction**.**

Survey 5:

Xinran Gao,Junwei Wang And Liping Yang (2022)
"An Explainable Machine Learning Framework for Forecasting Crude Oil
Price during the COVID-19 Pandemic "

Financial institutions, investors, central banks and relevant corporations need an efficient and reliable forecasting approach for determining the future of crude oil price in an effort to reach optimal decisions under market volatility. This paper presents an innovative research framework for precisely predicting crude oil price movements and interpreting the predictions. First, it compares six advanced machine learning (ML) models, including two state-of-the-art methods: extreme gradient boosting (XGB) and the light gradient boosting machine (LGBM). Second, it selects novel data, including user search big data, digital currencies and data on the COVID-19 epidemic. The empirical results suggest that LGBM outperforms other alternative ML models. Finally, it proposes an interpretable framework for facilitating decision making to interpret the prediction results of complex ML models and for verifying the importance of various features affecting crude oil price. The results of this paper provide practical guidance for participants in crude oil market.

Survey 6:

M.Rajeswari , S. Ramya , A ArunPrasath (2022) "OIL PRICE PREDICTION USING MACHINE LEARNING MODEL".

Machine Learning allows programming applications to be more precise in predicting outcomes without having to explicitly customize it to try to do it. Oil plays an important part in the energy consumption of the world. The sharp rise in oil prices is shaking financial stocks globally. Because of non-linear factors, old statistical models are not suitable for accurately m pts us to mandate as a commitment to give a simple consent to the subsequent representation of oil price data and its related Index .

2.2 REFERENCES

1. An, Jaehyung. "Oil price predictors: Machine learning approach." 670216917 (2019).
2. Haykin, S. (1999). Neural Networks: A Comprehensive Foundation, 2nd edition, Prentice Hall, 842
3. Gupta, Nalini, and Shobhit Nigam. "Crude oil price prediction using artificial neural network." Proceed Computer Science170 (2020): 642-647.

4. Nandan Pandey. “Crude Oil Stock Price.” Kaggle, 22 July 2020, www.kaggle.com/awadhi123/crude-oilstock-price.
5. Coupland, Christine, and Andrew D. Brown. "Constructing
organizational identities on the web: A case study of Royal Dutch/Shell." Journal of management studies 41.8 (2004): 1325-1347
6. Kaufmann, R. K., & Ullman, B. (2009). Oil prices, speculation, and fundamentals: Interpreting causal relations among spot and futures prices. Energy Economics, 31(4), 550–558.
7. Shobhit Nigam. "Chapter 84 Single Multiplicative Neuron Model in Reinforcement Learning" , Springer Science and Business Media LLC, 20192.3

PROBLEM STATEMENT DEFINITION

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. Crude oil prices react to many variables, including supply and demand prospects and the perceived risk of market disruptions. Economic growth can drive up the demand for crude oil, while slowdowns tend to lower demand and prices.Crude oil prices react to many variables, including supply and demand prospects and the perceived risk of mark disruptions. Economic growth can drive up the demand for rude oil, while slowdowns tend to lower demand prices.High oil prices can drive job creation and investment as it becomes economically viable for oil companies to exploit higher-cost shale oil deposits. However, high oil prices also hit businesses and consumers with higher transportation and manufacturing costs.

Factors That Influence Pricing Of Oil And Gas

demand,Supply
Speculation, Demand for Oil.
Temporary Price Fluctuations.
Investing in Oil and Gas Drilling


I am
a developer
I'm trying to
future oil low cost for market
But
exportes in exporting countries
Because
generate revenue by selling our application
Which makes me feel
i feel about the future price prediction

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS

It’s easy to jump straight into value proposition design. That is the core of your business and where the revenue or exchange of value will come from. However, trying to provide value to a misunderstood customer is very risky business. Do you have your blinkers on? Try using this canvas before you design your value proposition to make sure your offer nails exactly what your customer wants, needs, or may pleasantly surprise them! Keep asking yourself “why would they care?”. What problem are you solving? What opportunity are you creating? In this empathy map what customer think and feels. this map shows the pain and gain of the customer and what do their hear about the problem. this is the easy way to understand the problem statement.

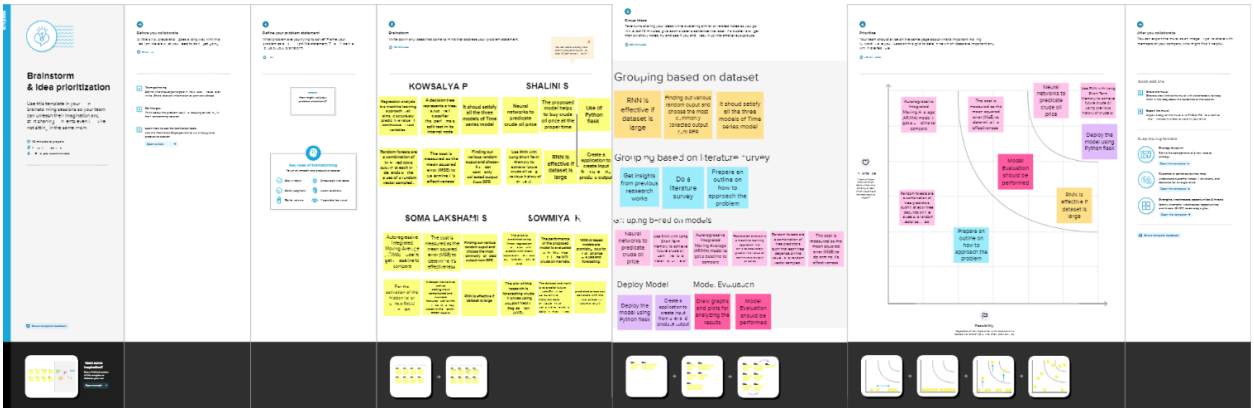
3.2 IDEATION & BRAINSTORMING

Brainstorming is **a method of generating ideas and sharing knowledge to solve a particular commercial or technical problem, in which participants are encouraged to think without interruption**. Brainstorming is a group activity where each participant shares their ideas as soon as they come to mind

3.3 PROPOSED SOLUTION

Prediction of future crude oil price considered a significant challenge to the extremely complex,and dynamic nature of the market and stakeholders perception. Generate Revenue by

Selling our application.The crude oil price movements are subject to diverse influencing factors. Includes on applying neural networks to predict the crude oil price .we are using the previous history of crude oil prices to predict future crude oil so,we would implement and improve to accuracy model. Our aim is to build an application of heart diseases prediction system using Flask and deployed on Heroku. A csv file is given as input. aAfter the successful completion of operation the result is predicted and displayed.



3.4 PROBLEM SOLUTION FIT

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. After having identified the target customer segment, it's time to **investigate their needs**. One of the cheapest, fastest and most informative things to do at this stage is to meet with customers through **customer discovery interviews** (more about customer discovery interviews here and here) until we keep hearing the same things from customers. Meeting with a customer is an invaluable source of insights, much more valuable than a survey.Besides, as entrepreneurs, our job is to meet and pitch to customers all the time, we'd be better off to start earlier rather than later.

CHAPTER 4

REQUIREMENT ANALYSIS

A functional requirement defines a system or its component. A non-functional requirement defines the quality attribute of a software system. It specifies "What should the software system do?" It places constraints on "How should the software system fulfill the functional requirements?

4.1 FUNCTIONAL REQUIREMENT

Fr no	Functional requriement(epic)	sub requirement (story /sub-task)
Fr-1	User application	User direct open with google play store app user can download the crude oil price
Fr-2	User product available	User using the application there are so many products in crude oil price app user updates the energy and oil price instant the application
Fr-3	User additional features	User can read latest news and view oil price charts user view major energy quotes user can using multiple color themes
Fr-4	User exception	User can exchange rates and currency converter

4.2 NON-FUNCTIONAL REQUIREMENT

NON FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution

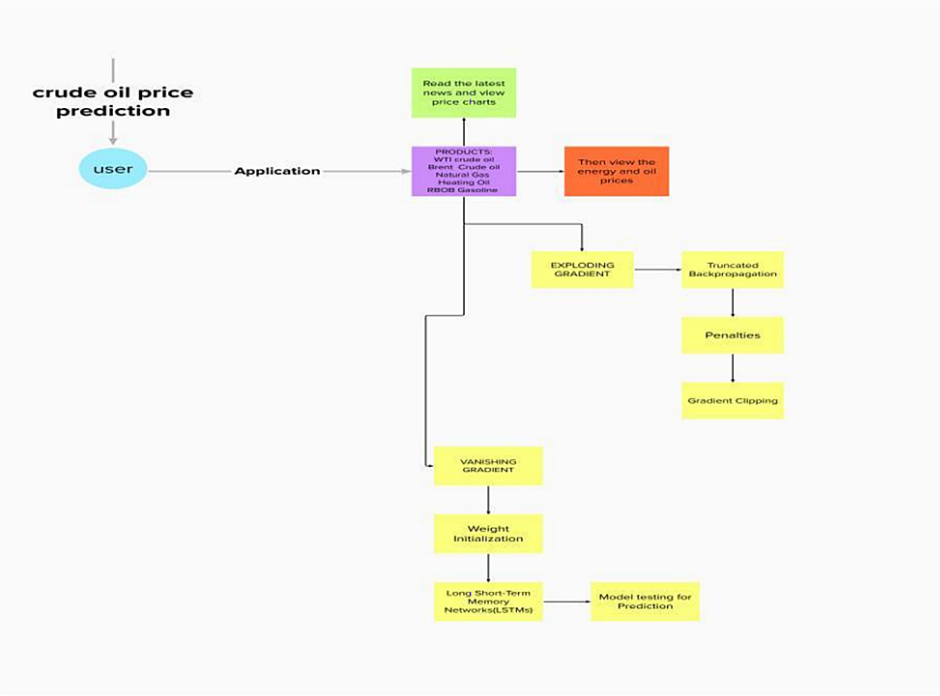
FR NO	NON - FUNCTIONAL REQURIEMENT	DESCRIPTION
NFR-1	Usability	Used to improve to the accuracy of crude oil price prediction
NFR-2	Security	In the rising oil price can even shift economical/political power from oil imports to oil exporters communication will be secured
NFR-3	Reliability	Reliability of the pointing towards high -risk components
NFR-4	Performance	Performance of the projects is to improve to the accuracy of oil price prediction
NFR-5	Availability	The availability solution is more benefit for and the imports and exporters in the crude oil price prediction
NFR-6	Scalability	The scalability are 90%-95%

CHAPTER 5

PROJECT DESIGN

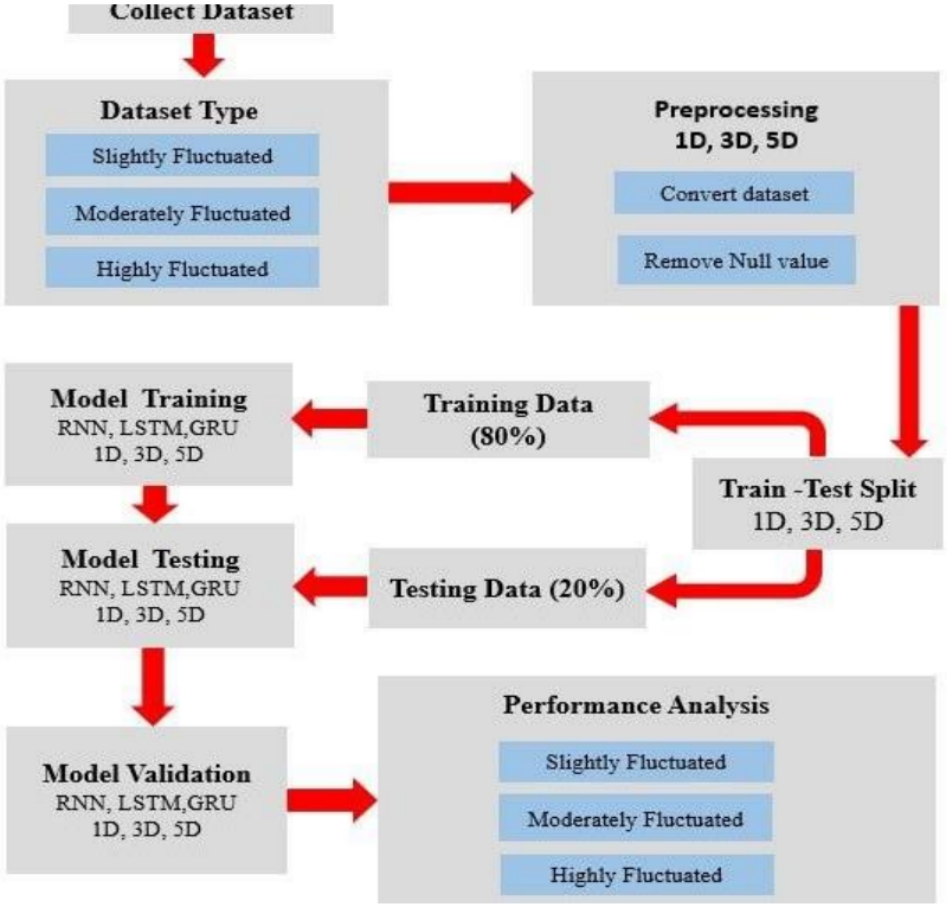
5.1 DATA FLOW DIAGRAM

A data flow diagram (DFD) is **a graphical or visual representation using a standardized set of symbols and notations to describe a business's operations through data movement**



5.2 SOLUTION AND TECHNICAL ARCHITECTURE

A solution architecture (SA) is **an architectural description of a specification solution**. SA combine guidance from different enterprise architecture viewpoints (business, information and technical), as well as from the enterprise solution architecture (ESA)



5.3 User Stories

user stories

use the below template to list all the stories for the product

User type	Functional requirement	User story number	User story /task	Acceptance criteria	Priority	Releases
Customer (mobile user)	**Application**	**Usn-1**	**As a user direct open with google play store app user can download the crude oil price**	**I can access own decisions**	**high**	**sprint-1**
	Available products	**Usn-2**	**As a user the application there are so many products in crude oil price app user update the energy and oil price instant the application**	**I can receive the data once click then confirm**	**high**	**sprint-2**
	Additional features	**Usn-3**	**As a user can read latest news and view oil price charts user view major energy quotes user can using a multiple color themes**	**I can view then read the price prediction**	**high**	**sprint-1**
	Expectations	**Usn-4**	**User can exchange rates and currency converter**	**I can expect**	**medium**	**sprint-1**
	login	**Usn-5**	**As a user ,login directly then no email,username, password**			**sprint-1**
Customer (web			**As a user I can view the crude oil price**	**I can view the price directly**	**high**	**sprint-1**

user)						
Customer care executive			**As a user I executive the given price history**	**I can accept the terms**	**medium**	**sprint-1**

CHAPTER 6

PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

SPRINT	FUNCTIONAL REQUIREMENT	USER STORY NUMBER	USER STORY/ TASK	STORY POLNTS	PRIORITY	TEAM MEMBERS
SPRINT 1	Data collection	USN-1	Collection and dataset	10	High	KOWSALYA SHALINI SOMALAKSHMI SOWMIYA
SPRINT 2	Data pre-processing	USN-2	Data pre-processing	7	Medium	KOWSALYA SHALINI SOMALAKSHMI SOWMIYA
SPRINT 3	Model Building	USN-3	Prepare the model by importing the necessary libraries, adding the layers, and compiling it	10	High	KOWSALYA SHALINI SOMALAKSHMI SOWMIYA
SPRINT 3	Model Building	USN-4	The data classification model is trained using RNNs and other	7	Medium	KOWSALYA SHALINI SOMALAKSHMI SOWMIYA

			systems.			
SPRINT 4	Application Building	USN-5	Deploy the model in IBM cloud and build the system	10	High	KOWSALYA SHALINI SOMALAK SHMI SOWMIYA
SPRINT 4	Training and testing	USN-6	Testing the model's performan ce and training it.	7	Medium	KOWSALYA SHALINI SOMALAK SHMI SOWMIYA

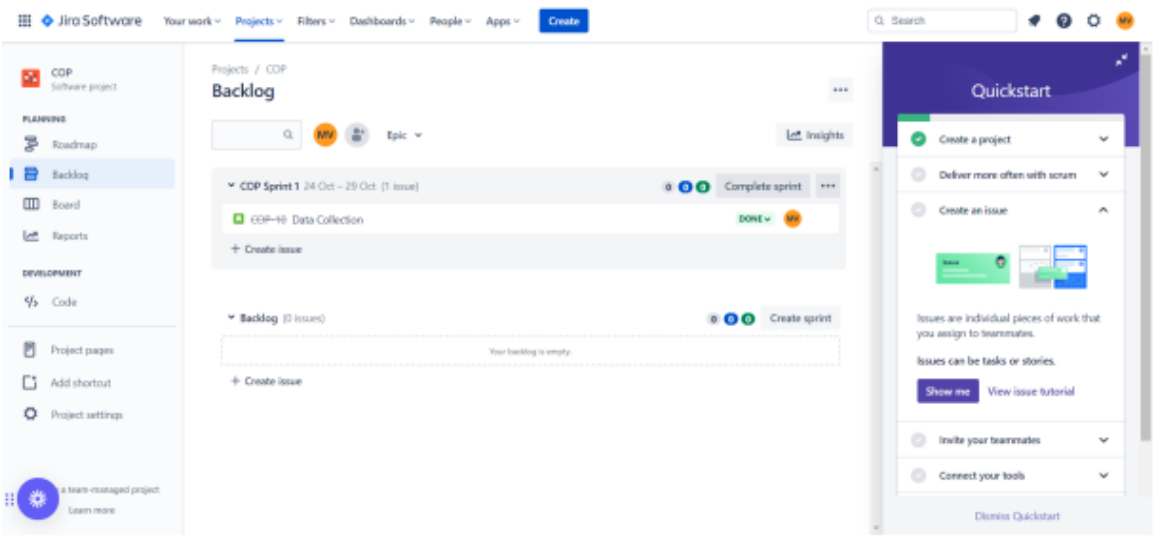
6.2 SPRINT

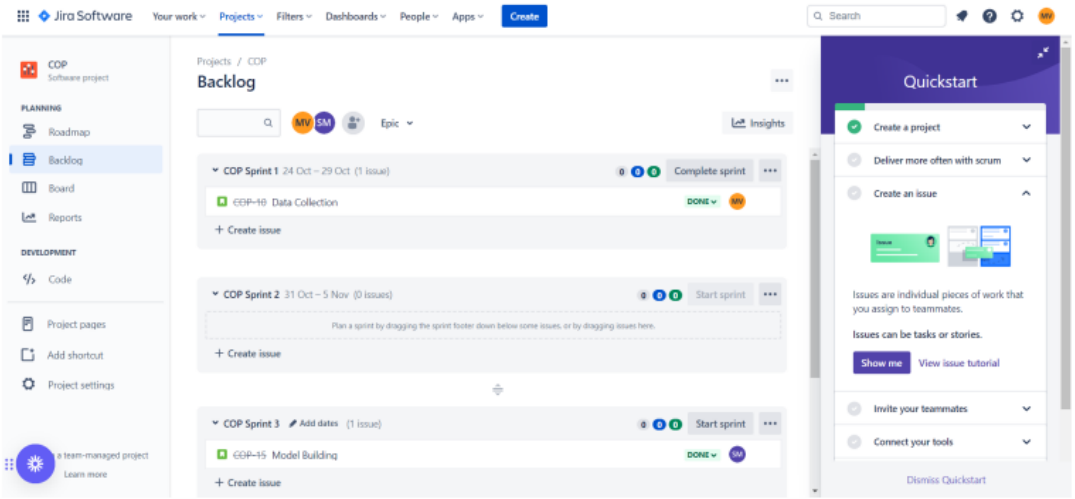
DELIVERY&SCHEDULE

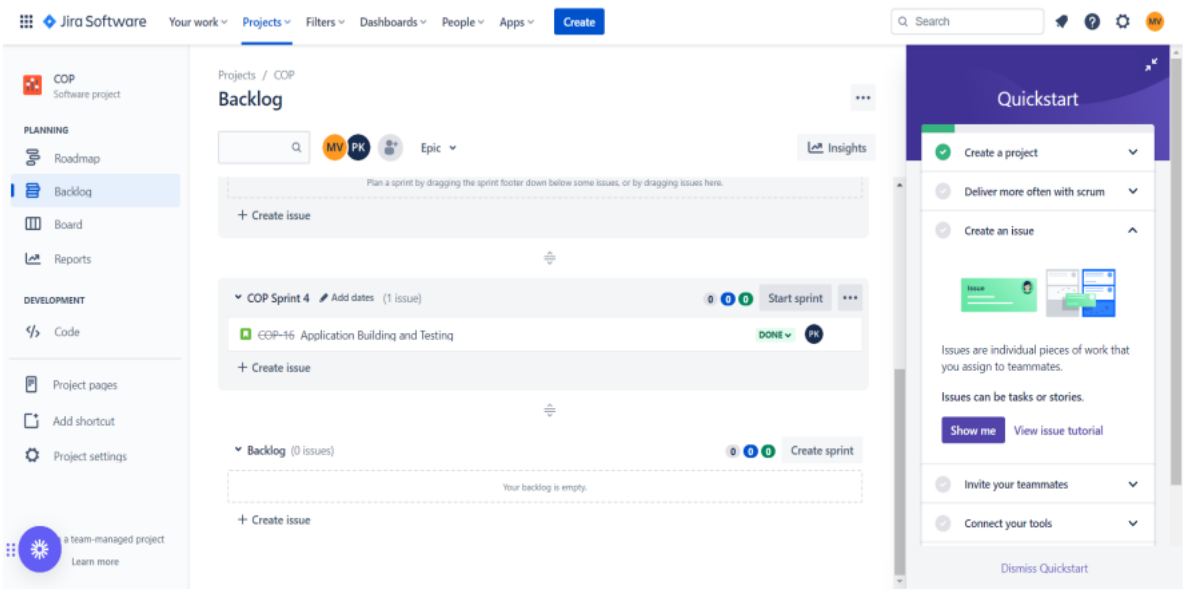
TITLE	DESCRIPTION	DATE
Literature survey& information gathering	Literature survey on the selected project & gathering information by referring the,technical papers,research publications etc.	28 SEPTEMBER 2022
prepare empathy map	prepare empathy Map Canvas to capture the user pains&gains,the prepare list of problem statements	10 OCTOBER 2022
Ideation	list the by organizing the brainstorming session and prioritize the top 3 ideas based on the feasibility	30 SEPTEMBER 2022
proposed solution	prepare the proposed solution document,which	5 OCTOBER 2022

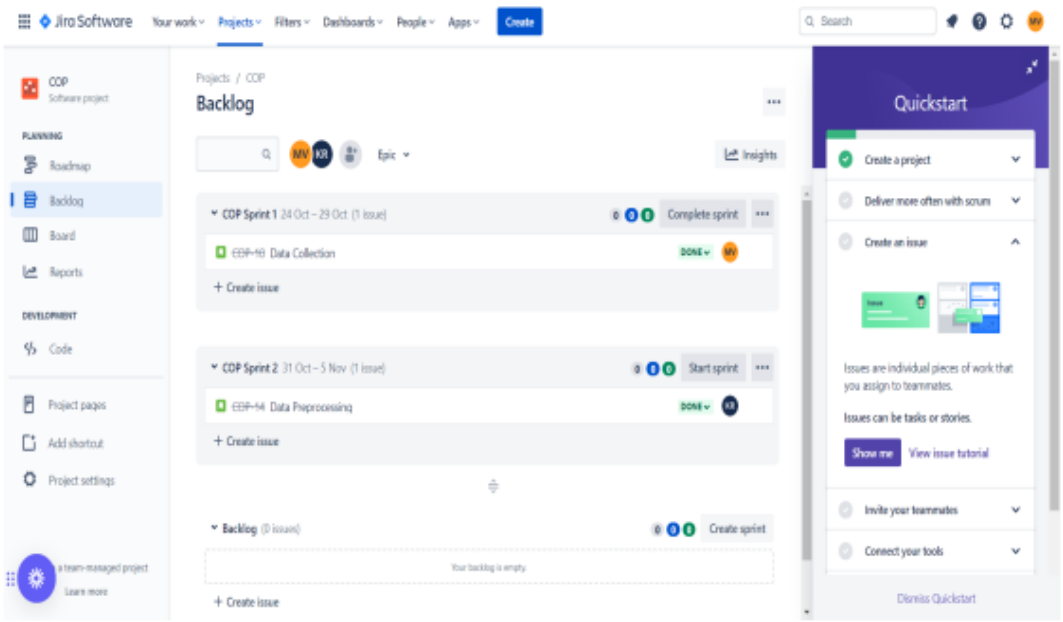
	includes the novelty,feasibility of idea,business model,social impact,	
problem solution fit	prepare problem-solution fit document	25 SEPTEMBER 2022
Solution architecture	prepare solution architecture document.	11 OCTOBER 2022
Customer journey	prepare the customer journey maps to understand the user interaction and experience with the application (entry to exit)	9 OCTOBER 2022
Functional requirement	prepare the function requirement document	20 OCTOBER2022
Data flow diagrams	draw the data flow diagrams and submit for review	23 OCTOBER 2022
Technology architecture	prepare the technology architecture diagram	26 OCTOBER 2022
Prepare milestone and activity list	prepare the milestone and activity list of the project	26 OCTOBER 2022
Project development -delivery of sprint -1,2,3&4	develop & submit the developed code by testing it	12 NOVEMBER 2022

6.3 Reports from Jira



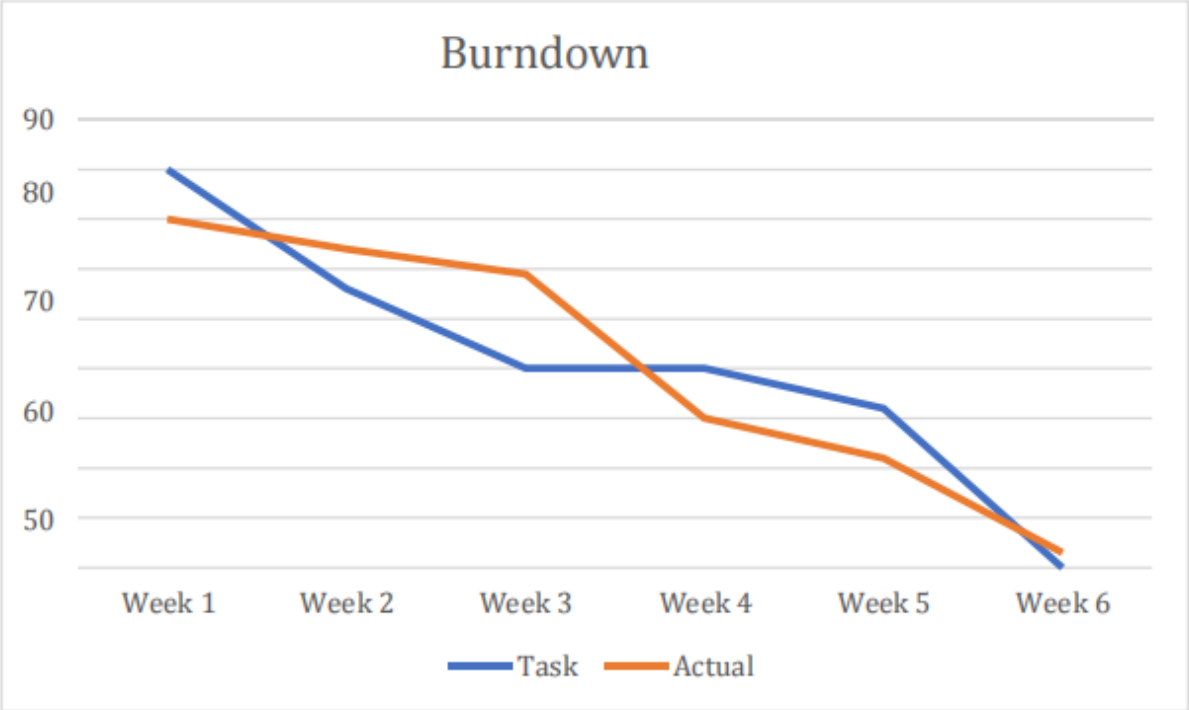



Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
COP
Software project
PLANNING
Roadmap
Backlog
Board
Reports
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
a team-managed project
Learn more
Projects / COP
Backlog
Epic
Insights
Plan a sprint by dragging the sprint footer down below some issues, or by dragging issues here.
Create issue
COP Sprint 4
Add dates
(1 issue)
Start sprint
EDP-16 Application Building and Testing
DONE
Backlog (0 issues)
Create sprint
Your backlog is empty.
Quickstart
Create a project
Deliver more often with scrum
Create an issue
Issues are individual pieces of work that you assign to teammates.
Issues can be tasks or stories.
Show me
View issue tutorial
Invite your teammates
Connect your tools
Dismiss Quickstart


Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
COP
Software project
PLANNING
Roadmap
Backlog
Board
Reports
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
a team-managed project
Learn more
Projects / COP
Backlog
Epic
Insights
COP Sprint 1 24 Oct – 29 Oct (1 issue)
Complete sprint
EDP-19 Data Collection
DONE
Create issue
COP Sprint 2 31 Oct – 5 Nov (1 issue)
Start sprint
EDP-14 Data Preprocessing
DONE
Backlog (0 issues)
Create sprint
Your backlog is empty.
Quickstart
Create a project
Deliver more often with scrum
Create an issue
Issues are individual pieces of work that you assign to teammates.
Issues can be tasks or stories.
Show me
View issue tutorial
Invite your teammates
Connect your tools
Dismiss Quickstart

A Burn down chart **shows the amount of work that has been completed in an epic or sprint, and the total work remaining**. Burn down charts are used to predict your team's likelihood of completing their work in the time available.

Burn down chart:



CHAPTER 7

CODING & SOLUTIONING

7.1 FEATURE 1

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Home page</title>
    <link rel="stylesheet" href="style.css">
</head>
<body>
    <div class="main">
     <div class="navbar">
    <div class="icon">
       <h2 class="logo">CRUDE OIL</h2>
</div>
<div class="menu">
  <ul>
       <li><a href="#">HOME</a></li>
       <li><a href="#">ABOUT</a></li>
       <li><a href="#">SERVICE</a></li>
       <li><a href="#">CONTACT</a></li>
</ul>
</div>
<div class="search">
     <input class="srch" type="search" name="" placeholder="Type To text"
<a href="#"> <button class="btn">Search</button></a>
  </div>
</div>
<div class="content">
    <h1>Crude Oil<br><span>Price Prediction</span><br></h1>
```

```
   <p class="par"> Crude oil means a mixture of hydrocarbons that exists in
liquid phase in<br>
    natural underground reservoirs and remains liquid <br>at atmospheric
pressure
        after passing through <br>surface separating facilities.</p>
        <button class="cn"><a href="register.html">JOIN US</a></button>
        <div class="form">
          <h2>Login Here</h2>
          <input type="email" name="email" placeholder="Enter Email Here">
          <input type="password" name="" placeholder="Enter Password
Here">
         <button class="btnn"><a href="#">Login</a></button>
         <p class="link">Don't have an account<br>
         <a href="#">Sign up </a> here</a></p>
         <p class="liw">Log in with</p>
<div class="icons">
        <a href="#"><ion-icon name="logo-facebook"></ion-icon></a>
        <a href="#"><ion-icon name="logo-google"></ion-icon></a>
</div>
</div>
  </div>
  </div>
</div>
</div>
<script src="https://unpkg.com/ionicons@5.4.0/dist/ionicons.js"></script>
</body>
</html>
```

7.2 FEATURE 2

```
   color:#ff7200
}*{
    margin: 0;
    padding: 0;
}
body{
    background:url(cr.jpg);
    background-position: center;
   background-size: cover;
}
div.main{
     width: 400px;
      margin: 100px auto 0px auto ;
}
h2{
   text-align: center;
   padding: 20px;
   font-family: Arial;
}
div.register{
   background-color: rgba(0, 0, 0, 0.5);
   width: 100%;
    font-size: 20px;
    border-radius: 10px;
    border: 1px solid rgba(255, 255, 255, 0.3);
    box-shadow: 2px 2px 15px
    rgba(0,0,0,0.3);
form#register{
    margin: 40px;
}
 label{
    font-family: Arial;
    font-size: 18px;
}
input#name{
```

```
    width: 300px;
    border: 1px solid #ff7200;
    border-radius: 3px;
outline: 0;
padding: 7px;
background-color: #000;
box-shadow: inset 1px 1px 5px
rgba(0, 0, 0, 0.3);}
input#submit{
width: 240px;
   height: 40px;
   background: #ff7200;
   border: none;
   margin-top: 30px;
   font-family: Arial;
   font-size: 18px;
   font-weight: bold;
   border-radius: 10px;
   cursor: pointer;
   color: #fff;
   transition: 0.4s ease;
   margin-bottom: 20px;
}
label,h2{
    text-shadow: 1px 1px 5px rgba(0, 0, 0, 0.3);
}
span{
    color: #000;
    text-shadow: 1px 1px 5px rgba(0, 0, 0, 0.3);
}
font-size: 1.5vw; border-radius: 10px;
    margin: 2px;
    padding: 8px;
}
.form input{
   width: 240px;
   height: 35px;
```

```
  background: transparent;
  border-bottom: 1px solid #ff7200;
  border-top: none;
  border-right: none;
  border-left: none;
  color: #fff;
  font-size: 15px;
  letter-spacing: 1px;
  margin-top: 30px;
  font-family: sans-serif;
}
.form input:focus{
   outline: none;
}
::placeholder{
   color: #fff;
   font-family: Arial;
}
.btnn{
   width: 240px;
   height: 40px;
   background: #ff7200;
   border: none;
   margin-top: 30px;
   font-size: 18px;
   border-radius: 10px;
   cursor: pointer;
   color: #fff;
   transition: 0.4s ease;
}
.btnn:hover{
   background: #fff;
   color: #ff7200;
}
.btnn a{
   text-decoration: none;
   color: #000;
```

```
    font-weight: bold;
}
.form .link{
    font-family: Arial, Helvetian, sans-serif;
    font-size: 17px;
    padding-top: 20px;
    text-align: center;
}
.form .link a{
    text-decoration: none;
    color: #ff7200;
}
.liw{
    padding-top: 15px;
    padding-bottom: 10px;
    text-align: center;
}
.icons a{
    text-decoration: none;
    color: #fff;
}
.icons ion-icon{
    color: #fff;
    font-size: 40px;
    padding-left: 60px;
    padding-top: 5px;
   transition: 0.3s ease;
}
.icons ion-icon:hover{
    color: #ff7200;
}
@media screen and (max-width:1200px) {
   /*Normal Screen*/
.navbar{
     width: 100%;
      height: 100px;
}
```

```
ul{
    margin-left: 30px;
}
ul li{
     margin-left: 60px;
}
ul li a{
font-size: 1.6vw;
}.search{
margin-top: 3px;
margin-left: 290px;
}
.srch{
height: 40px;
width: 190px;
font-size: 14px;
}
.btn{
height:40px;
width: 80px;
}
.content{
width: 100%;
}
.content h1, .content span{
font-size: 4.5vw;
}
.content .par{
width: 90%;
}
.content .cn{
width: 13%;
height: 3.5vw;
font-size: 1.8vw;
}
.content a{
font-size: 1.6vw
```

```
}
}
@media screen and (max-width:1170px) {
/*Login-box*/
.main{
padding-left: 20px;
height: 180vh;
}
.form{
margin-left: -30px;
width: 250px;
height: 370px;
background: linear-gradient(to top, rgba(0,0,0,0.8)50%,rgba(0,0,0,0.8)50%);
position: absolute;
top: 420px;
```

TESTING

8.1 TEST CASES

A test case is nothing but **a series of step executed on a product, using a predefined set of input data, expected to produce a pre-defined set of outputs, in a given environment**. It describes “how” to implement those test cases. Test case specifications are useful as it enlists the specification details of the items. The purpose of testing is to discover errors . Testing is the process of trying to discover every conceivable fault or weakness in a work product . It provide a way to check the functionality of component , sub assemblies , assemblies and/or a finished product.It is the process of exercising software with the intent of ensuring that the software system meets its requirement and user expectation and does not fail in an unacceptable manner. There are various types of testing. Each test type addressing a specific testing requirement. The testing report are submitted in github.

8.2 USER ACCEPTANCE TESTING

User acceptance testing is a critical phase of any project and requires significant participant by the end user. It also ensure that the system meets the functional requirement.

1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the [Crude Oil] project at the time of the release to User Acceptance Testing (UAT).

2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By design	10	4	3	2	19
External	1	0	2	0	3
Fixed	2	2	0	1	5
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	1	0	0	1
Wont'Fix	1	5	0	0	6
Totals	25	14	10	23	72

1.TEST CASE ANALYSIS

Selection	Total case	Not tested	Fail	Pass
Print Engine	7	1	1	5
Client Application	51	0	1	50
Security	2	0	0	2
Outsource shipping	3	0	0	3
Exportation	9	0	0	9

Reporting				
Final Report Output	4	0	0	4
Version	2	0	0	2

CHAPTER 9

RESULT

9.1 PERFORMANCE MATRICES

Project team shall fill the following information in model performance testing templates

S.NO	PARAMETER	VALUES	SCREENSHOT
1.	Matrix	REGERSSION MODEL: MAE-,MSE-, RMSE-,R2 score CLASSIFICATION MODEL: confusion matrix-, Accuracy score-&classification report	RMSE for different models used in our projects Liner Regression:19.35336 62859143
2.	Tuned the model	Hyper parameter tuning-validation method.	Hyper parameter tuning In the use of over fitting, some inclusion of regularization and further hyper parameter tuning for the training process must be considered. A good model should

			be based on a compromise between capturing the essential patterns in the data.

CHAPTER 10

ADVANTAGES:

The advantage of this model are high performance and accuracy rate.

It is very flexible and high rates of success are achieved

The application when implemented using random forests has more accuracy rate when compare to other algorithm. In this system, we achieve around 98%.

DISADVANTAGES:

1. Falling oil prices hurt a key sector of stock market.
2. Less business spending automation of energy and equipment firms.
3. Sagging economics higher supply mayor reason for oil drop, investor worry persistent declines.
4. Less business spending automation of energy and equipment forms.These facilities high demand of actuator and values

CHAPTER 11

CONCLUTION

The main purpose of this paper is to develop a time series collection of regular observations on oil price datasets. Used to predict future value based on historical data. Non- linear trends are fitted using annual, weekly, and daily data. This white paper integrates machine learning models such as FB Prophet a to analyze, classify, and predict time series data.Historical data is presented using variables analyzed and calculated during the algorithm execution module, and each algorithm makes a series of oil price predictions using this set of values.

CHAPTER 12

FUTURE SCOPE

The project's future potential is enormous. The project can be implemented with the real-time functionalities that are necessary. Because it is quite versatile in terms of expansion, the project can be upgraded in the near future as and when the need arises. The complete prediction value can be increased in a much better, accurate, and error-free manner with the proposed approach. The project can be enhanced with real time data.

CHAPTER 13

APPENDIX

PYTHON

Python is a computer programming language often used to **build websites and software, automate tasks, and conduct data analysis**. Python is a general purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

SOURCE CODE
LOGIN

```
h1 {
text-align: center;
    color: floral white;
    font-size: 50px;
    font-family: cursive;
}
p {
font-family: cursive;
    color: ghostwrite;
    margin-right: 30px;
    margin-left: 30px;
    text-align: center;
    font-size: 20px;
    font-weight: bold;
}
body{
  background: url(back2.jpg);
  background-repeat: no-repeat;
  background-size: 100% 275%;
}
.button {
  display: inline-block;
```

```
  border-radius: 4px;
  background-color: black;
  border: none;
  color: #FFFFFF;
  text-align: center;
  font-size: 20px;
  padding: 12px;
  width: 100px;
  transition: all 0.5s;
  cursor: pointer;
  margin: 5px;
}
a{
font-size: 20px;
  font-family: cursive;
  color: ghostwrite;
  margin-right: 30px;
  margin-left: 30px;
  text-align: center;
  font-size: 20px;
 font-weight: bold;
}
```

USER REGISTRATION

```
<!DOCTYPE html>
<html>
<head>
<title>Registration Form</title>
<link rel="stylesheet"
href="register.css" type="text/css">
</head>
<body>
<div class="main">
<div class="register">
<h2>Register Here</h2>
<form id="register" method="post"><label>First Name : </label>
<br>
<input type="text" name="fname"
id="name" placeholder="Enter Your First Name">
<br><br>
<label>Last Name : </label>
<br>
<input type="text" name="lname"
id="name" placeholder="Enter Your last Name">
<br><br>
<label>Your Age : </label>
<br>
<input type="number" name="age"
id="name" placeholder="How Old Are You">
<br><br>
<label>Email : </label>
<br>
<input type="email" name="email"
id="name" placeholder="Enter Your Valid Email">
<br><br>
<label>Gender : </label>
<br>
```

```
<input type="radio" name="gender"
id="male">

<span id="male">Male</span>

<input type="radio" name="gender"
id="female">

<span id="female">Female</span>
<br><b
<input type="submit" value="Submit"
name="submit" id="submit">
</form>
</div>
</div>
</body>
</html
```

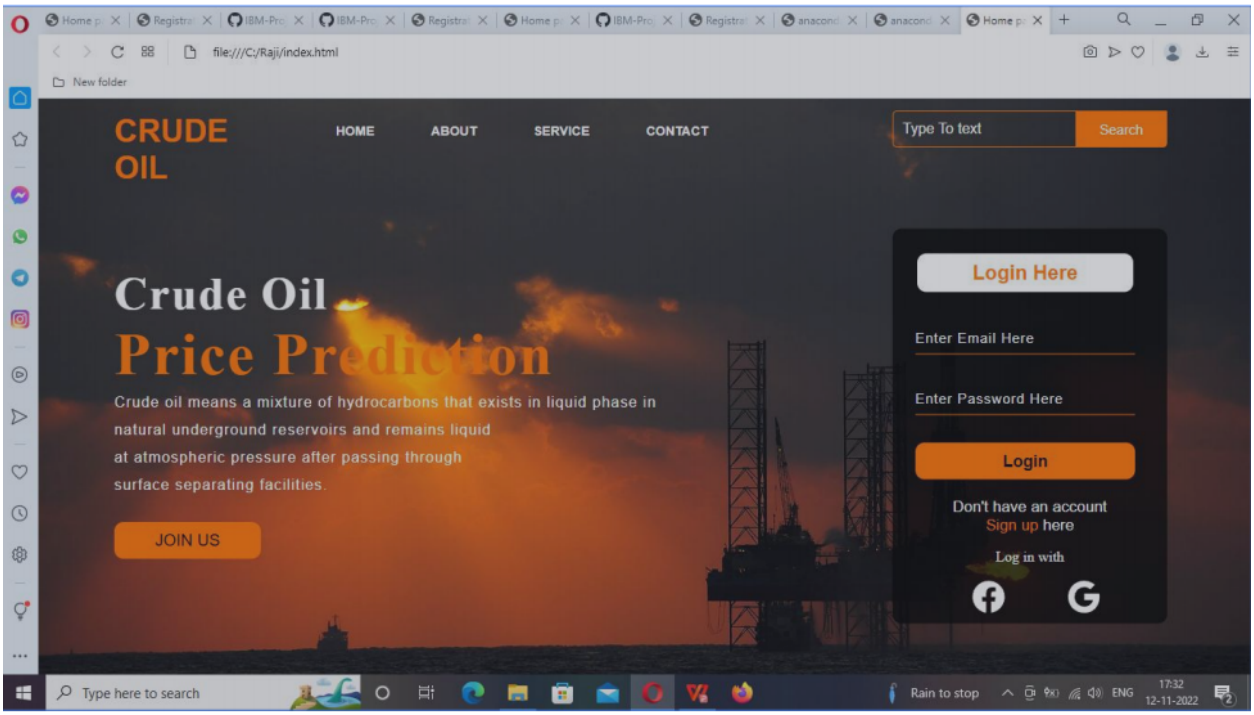
BUILD CODE

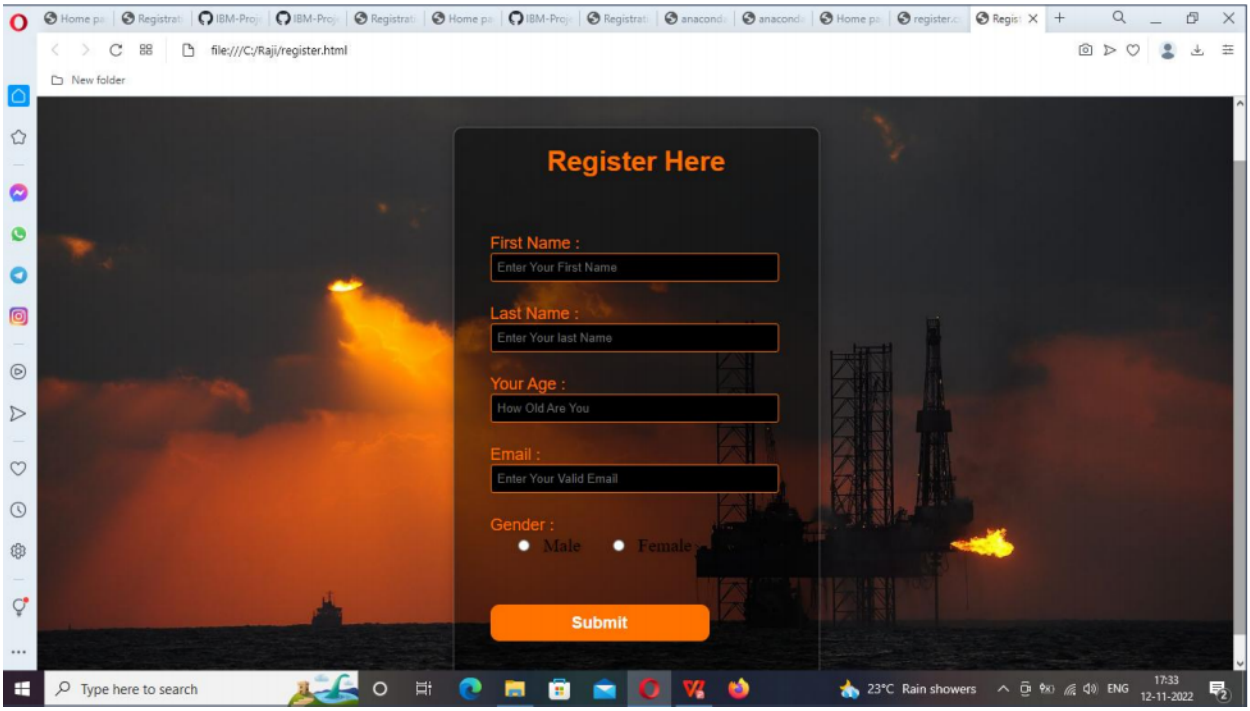
```
import numpy as np
from flask import Flask,render_template,request #flask is a application
#uesd to run/serve our application
#request is used to access the files which is uploaded by the user in
#our application
#render_template is used for rendering the html pages
from tensorflow.keras.models import load_model
app = Flask(__name__)#our flask app
model = load_model('crude_oil.h5',)#loading the model in the flask app
@app.route('/')
def home() :
return render_template("index.html")
@app.route('/about')
def home1() :
return render_template("index.html")
@app.route('/predict')
def home2() :
return render_template("web.html")
@app.route('/login',methods =['POST'])
def login() :
x_input=str(request.form['year'])
x_input=x_input.split(',')
print(x_input)
for i in range(0, len(x_input)):
x_input[i] = float(x_input[i])
print(x_input)
x_input=np.array(x_input).reshape(1,-1)
temp_input=list(x_input)
temp_input=temp_input[0].tolist()
lst_output=[]
n_steps=10
i=0
while(i<1):
if(len(temp_input)>10):
```

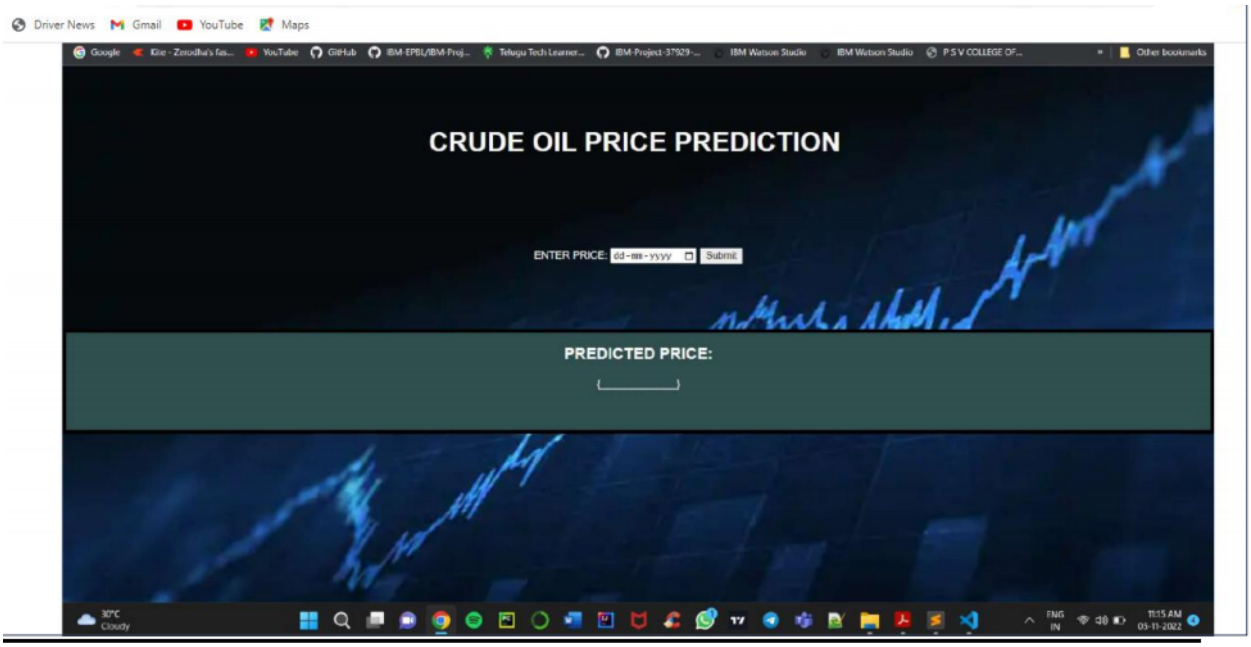
```
#print("temp_input",temp_input)
x_input=np.array(temp_input[1:])
print("{} day input {}".format(i,x_input))

x_input=x_input.reshape(1,-1)
x_input = x_input.reshape((1,n_steps, 1))
#print(x_input)
that =model.predict(x_input, verbose=0)
print("{} day output {}".format(i,that))
temp_input.extend(yhat[0].tolist())
temp_input=temp_input[1:]
#print(temp_input)
lst_output.extend(yhat.tolist())
i=i+1
else:
x_input = (x_input.reshape(1, n_steps,1))
that = model.predict( x_input, verbose=0)
print(yhat[0])
temp_input.extend(yhat[0].tolist())
print(len(temp_input))
lst_output.extend(yhat.tolist())
i=i+1
print(lst_output)
return render_template("web.html",showcase = 'The next day predicted value is:'+
str(lst_output))
#print str(x)
if __name__ == '__main__' :
app.run(debug=True,port=5000
```

SCREEN SHOT


file:///C:/Raji/index.html
New folder
CRUDE OIL
HOME
ABOUT
SERVICE
CONTACT
Type To text
Search
Crude Oil
Price Prediction
Crude oil means a mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities.
JOIN US
Login Here
Enter Email Here
Enter Password Here
Login
Don't have an account
Sign up here
Log in with
Type here to search
Rain to stop
ENG
17:32
12-11-2022


file:///C:/Raji/register.html
New folder
Register Here
First Name :
Enter Your First Name
Last Name :
Enter Your last Name
Your Age :
How Old Are You
Email :
Enter Your Valid Email
Gender :
Male
Female
Submit
Type here to search
23°C Rain showers
ENG
17:33
12-11-2022



PROJECT DEMO LINK:

https://drive.google.com/file/d/1c7hKRsoB6MSD_XnDt9wpW-qtvW2L0fYH/view?usp=drivesdk