Global Sales Data Analytics

TEAM ID

PNT2022TMID33054

TEAM MEMBERS

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PROJECT TITLE

Global Sales Data Analytics

CONTENT

1.INTRODUCTION

If you want to achieve your sales goals month after month, then guesswork and intuition aren't your best friends. You need to perform a strategic sales analysis and get cold, hard data.You will gain an understanding of the data ecosystem and the fundamentals of data analysis, such as data gathering or data mining.

1.1 Project Overview

The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support

1.2 Purpose

Regular sales data analysis provides an understanding of the products that your customers are buying and helps you dissect why they are behaving in a certain way. You can also find patterns in your lead conversions and drop offs.

Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions

Thousands of data points at your fingertips. Build, refine and analyse your audience in our intuitive platform. Monitor trends. Granular Global Analysis. 46 Countries. 17 Million Panelists. 40,000 Data Points. Create Bespoke Segments.

Sales analytics refers to the technology and processes used to gather sales data and gauge sales performance. Sales leaders use these metrics to set goals, improve internal processes, and forecast future sales and revenue more accurately.

2.LITERATURE SURVEY

2.1 Existing Problem :

1. Global sales process is way too long and don't have enough leads.
2. Leads are unqualified and wasting your effort on bad fit prospects.

3. Spending too much time on low-value task
4. The statement may include workflow bottlenecks,resources challenges or fundamental difficulties such as understanding a customer base
5. Identify the key sales metrics you need, such as win rate and average deal size
6. Use a tool (such as Pipe drive's CRM) to track this data as leads travel through your pipeline. Record this data in visual dashboards

2.2 REFERENCES

1.Han Jiawei, Micheline Kamber and Jian Pei, "Data Mining Concepts and Techniques" in , MK Publications, 2009.
https://scholar.google.com/scholar?as_q=Data+Mining+Concepts+and+Techniques

2.M. Tennekes and E. de Jonge, "Top-down Data Analysis with Tree maps", Proceedings of the International Conference on Information Visualization Theory and Applications (IVAPP' 11), pp. 236-241, March 2011.
https://scholar.google.com/scholar?as_q=Top-down+Data+Analysis+with+TreemapsHYPERLINK "https://scholar.google.com/scholar?as_q=Top-down+Data+Analysis+with+Treemaps&as_occt=title&hl=en&as_sdt=0%2C31" HYPERLINK

3.P. Hoek, "Parallel Arc Diagrams: Visualizing Temporal Interactions", Journal of Social Structure, vol. 12, 2011.

https://scholar.google.com/scholar?as_q=Parallel+Arc+Diagrams%3A+Visual izing+Temporal+InteractionsHYPERLINK "https://scholar.google.com/scholar?as_q=Parallel+Arc+Diagrams%3A+Visualizing+Temporal+Interactions&as_occt=title&hl=en&as_sdt=0%2C31" HYPERLINK.

2.3 Problem Statement definition:

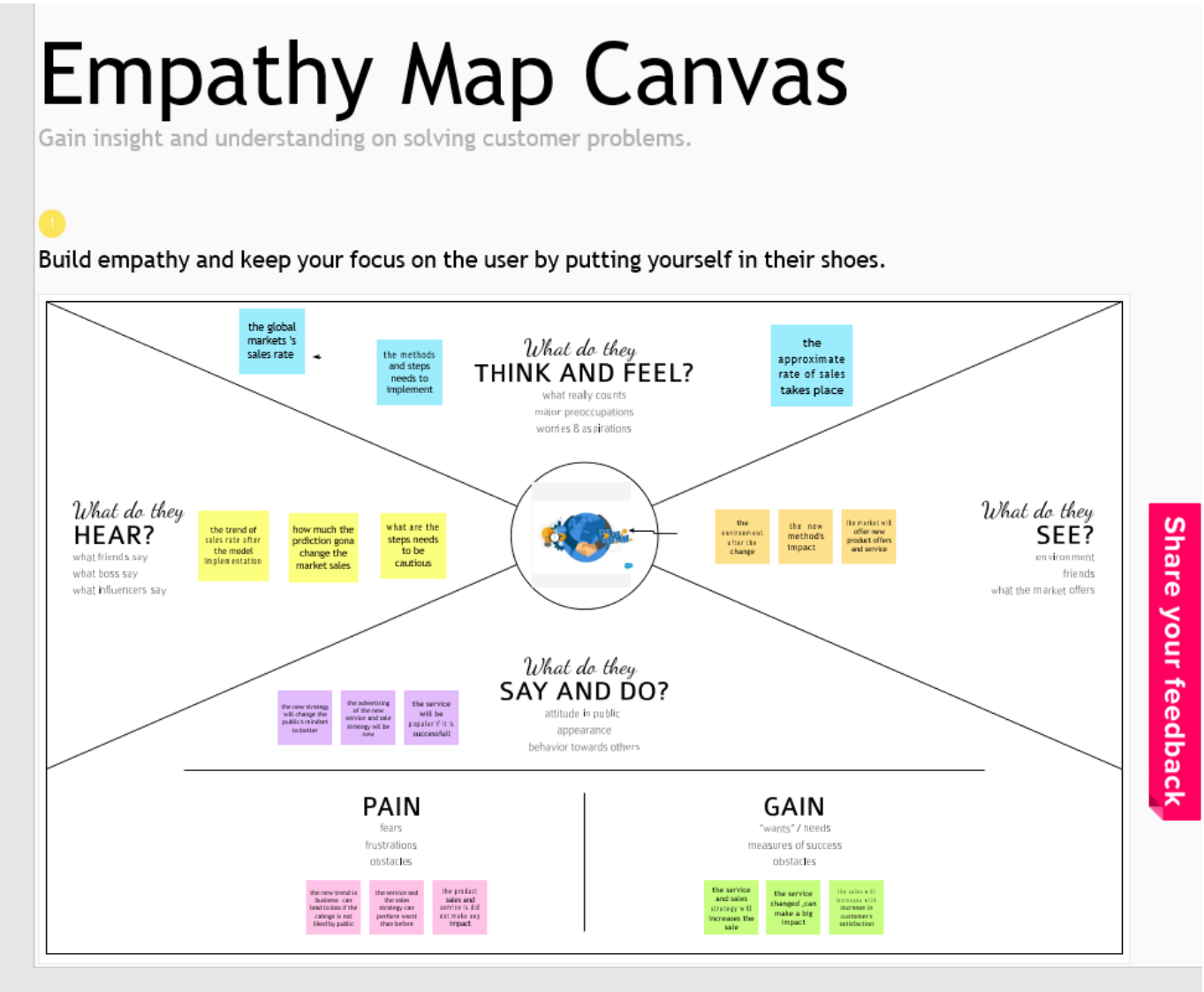
Problem statements are important to businesses, individuals and other entities to develop projects that states the challenges faced by your client.

You need to **analyze** the right kind of **sales** data for generating meaningful insights that positively affect your bottom line.

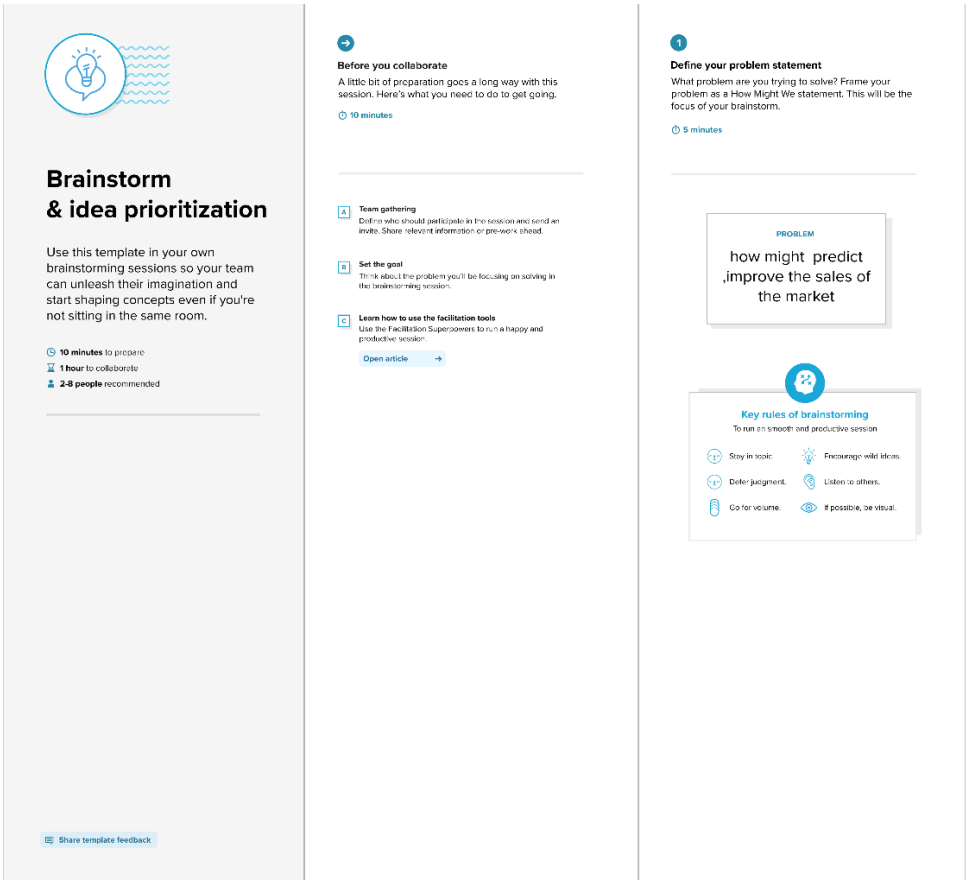
Sales analysis is vital for finding **weak spots and bottlenecks** in sales processes to collect and use sales data to achieve more sales goals.

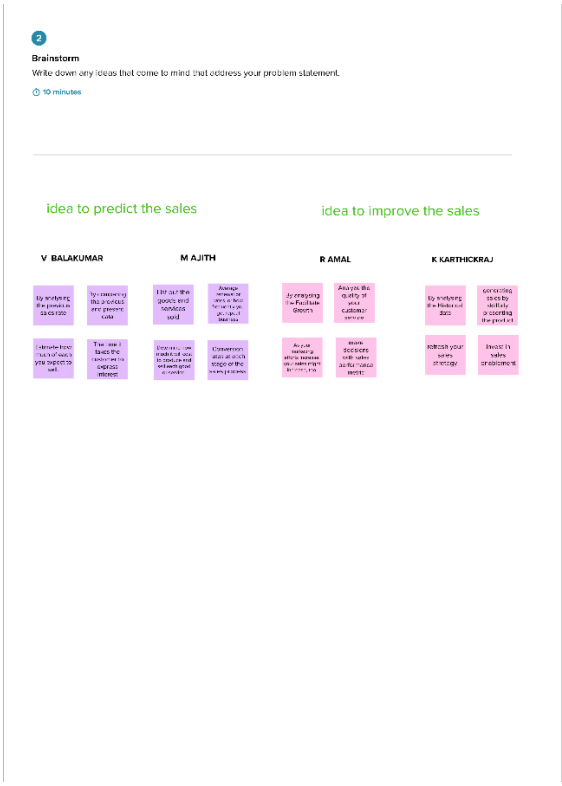
3. IDEATION & PROPOSED SOLUTION

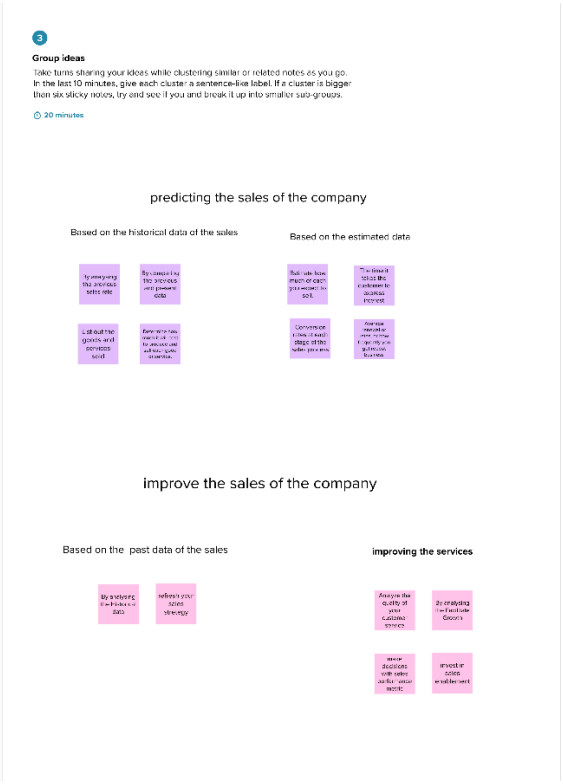
3.1 Empathy Map Canvas

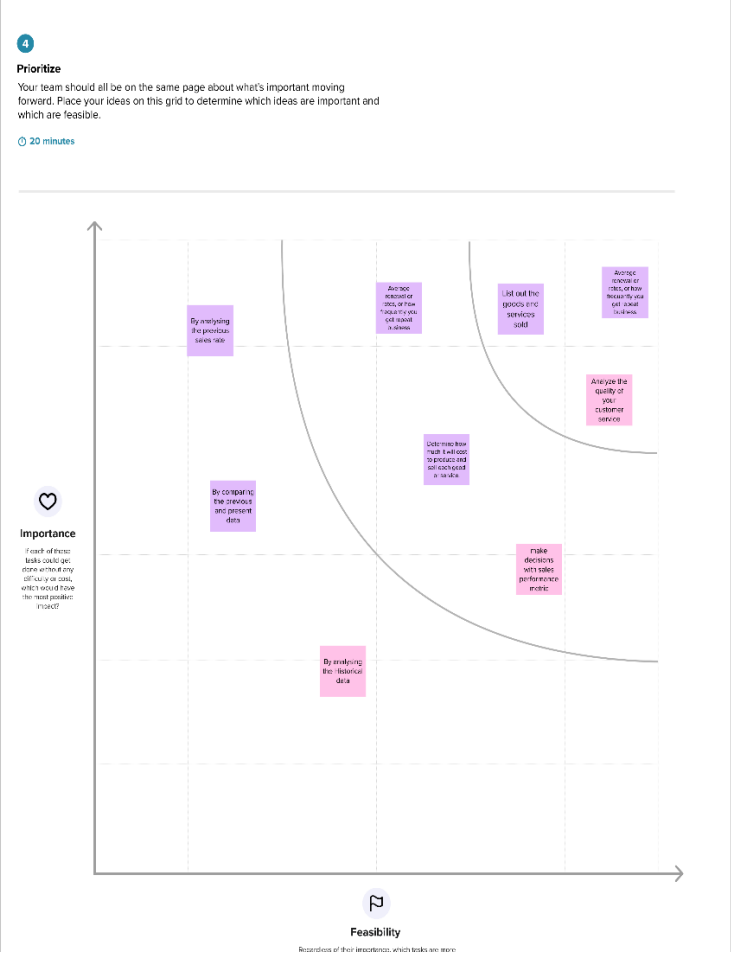


3.2 Ideation & Brainstorming







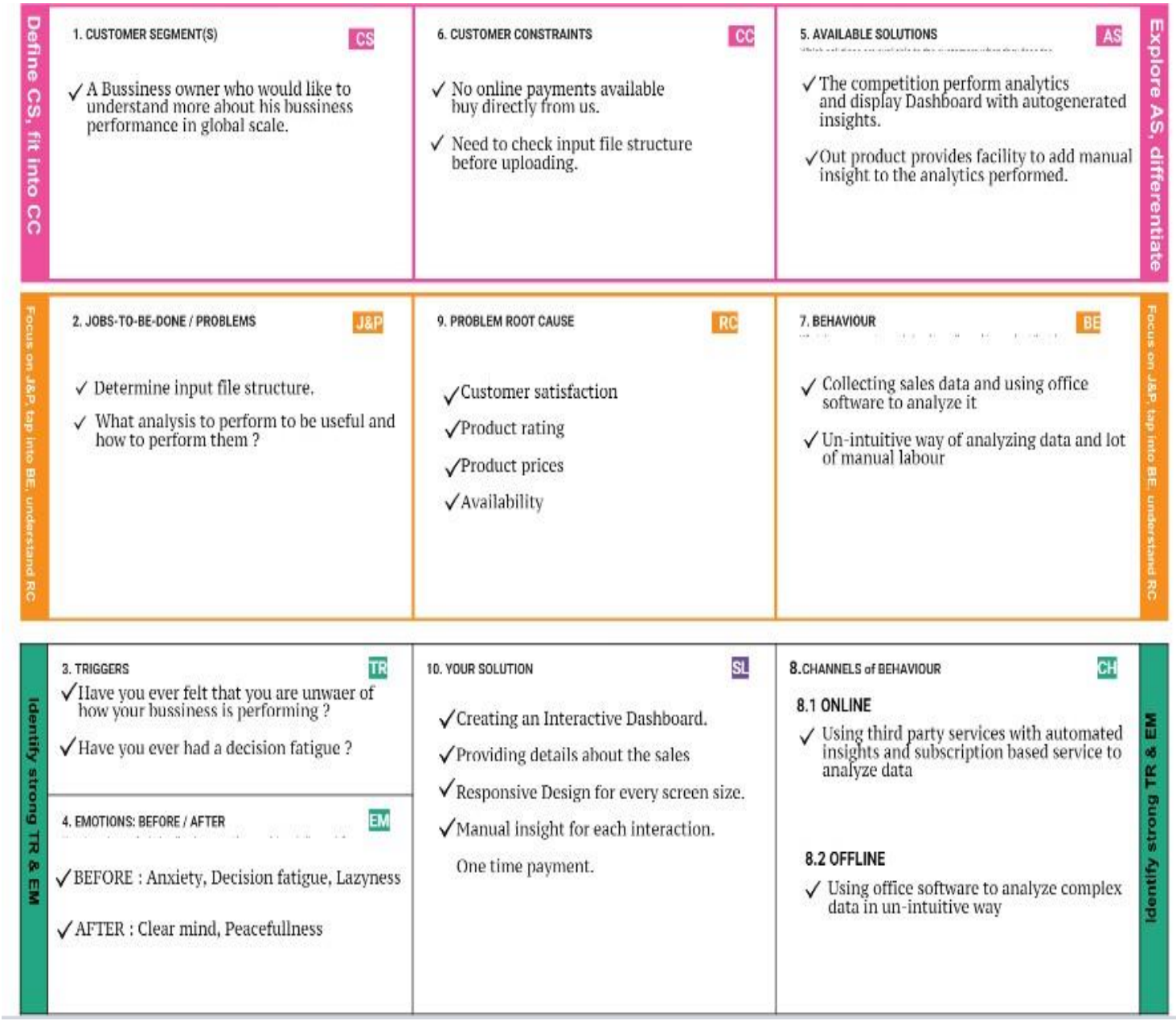


3.3 Proposed Solution

S. No	Parameter	Description
1.	Problem Statement (problem to be solved)	The mentioned system is designed to find the most frequent combinations of items. It is based on developing an efficient algorithm that outperforms the best available frequent pattern algorithms on a number of typical data sets. This will help in marketing and sales. We are given a large database of customer transactions. Each transaction consists of items purchased by a customer in a visit. We present an efficient algorithm that generates all signicant association rules between items in the database. The algorithm incorporates buer management and novel estimation and pruning techniques. We also present results of applying this algorithm to sales data obtained from a large retailing

		company, which shows the effectiveness of the algorithm.
2.	Idea / Solution description	We should aim to answer some basic questions that may arise for the store manager/owner/customers giving a much better insight about the store and how to increase the productivity.
3.	Novelty / Uniqueness	• Interactive Dashboard and simple UI • Dynamic and real time analytics • AI based predictions and forecasting
4.	Social Impact / Customer Satisfaction	Customer would know the available products and nearest location of shops the offers discounts.
5.	Business Model (Revenue Model)	• Drop Shipping • Wholesaling and Warehousing • Private Labeling and Manufacturing • White Labeling • Subscription
6.	Scalability of the Solution	Easy highly scalable applications can be deployed with help of cloud services. Making a website or app of this application is scaled and available to everyone.

3.4 Problem Solution fit



4. REQUIREMENT ANALYSIS

4.1 Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)

FR-1	User Registration	Registration through Gmail and Google Business.
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Input	Dataset uploaded to Cognos analytics tool.
FR-4	Data Verification and Validation	Data is cleaned and verified for Anomalies and Missing values.
FR-5	Data visualization	Appropriate graphs and attractive charts should be used to visualize the data.
FR-6	Business Decisions	Recommendations are made based on the insight gained from the data.

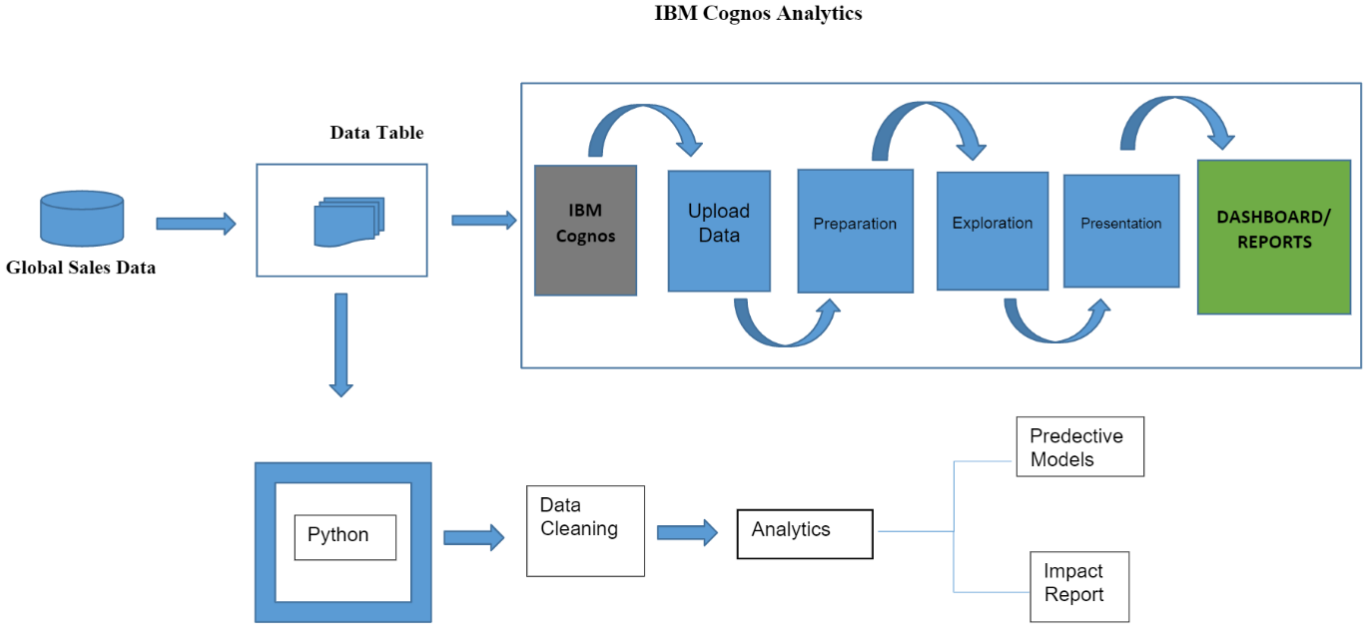
4.2 Non-Functional requirements

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Dashboards can be accessed by the user when the proper sales data is given.
NFR-2	**Security**	The Dashboard are accessible to the user only with proper login credentials.
NFR-3	**Reliability**	User's data and visualization must stay in the cloud and its should be accessible whenever the user wants without any problem.
NFR-4	**Performance**	The user can easily drag to any metrics they want to view, and it should work as expected and allows multiple users to access the data at the same time.
NFR-5	**Availability**	Uploaded data must be available at all time and be fault tolerant.
NFR-6	**Scalability**	It should be able to produce advanced graphs and provide proper interpretation of data over large volumes.

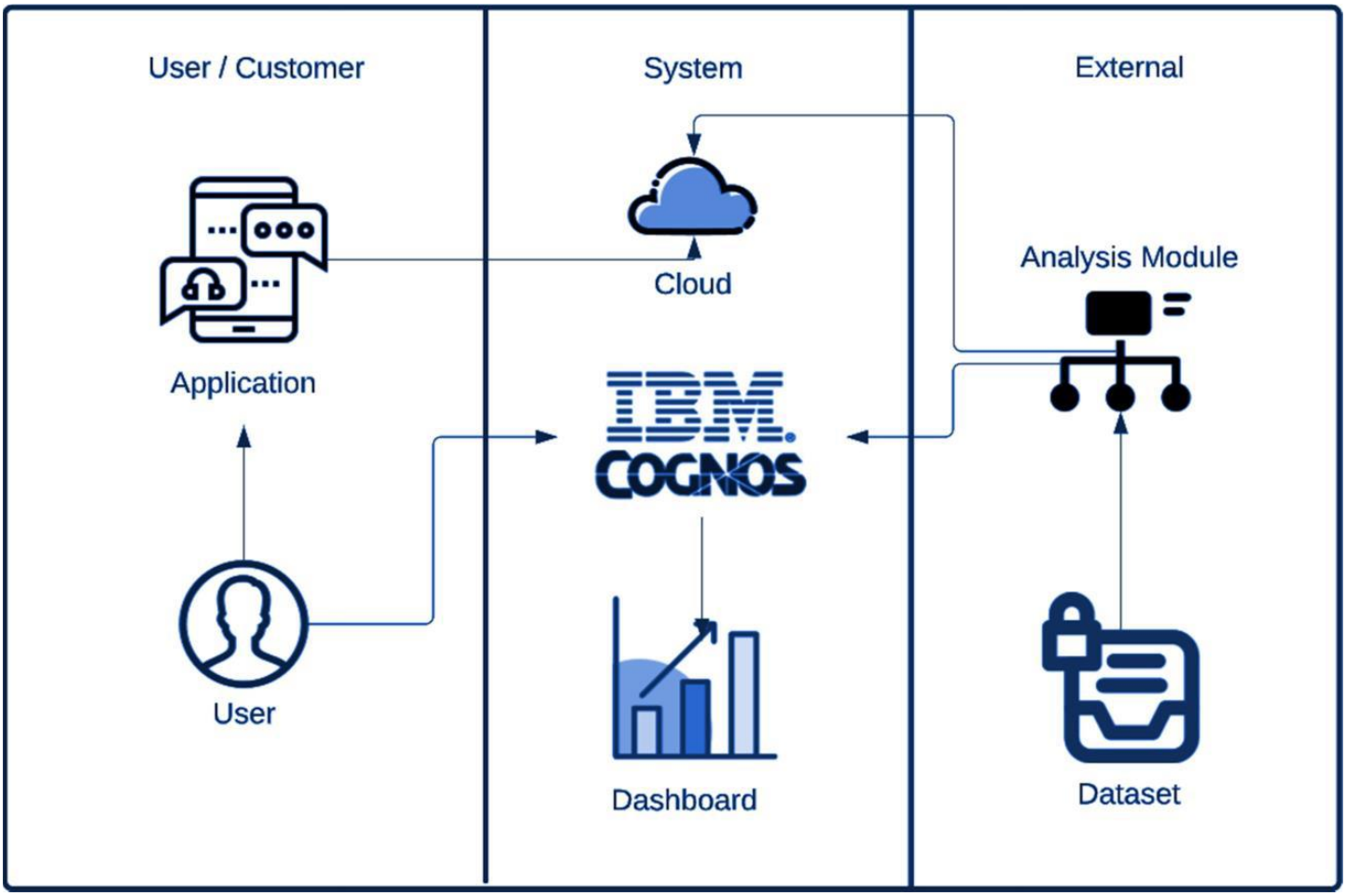
5. PROJECT DESIGN

5.1 Data Flow Diagrams

Data Flow Diagram:



5.2 Solution & Technical Architecture



Technical Architecture :

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	IBM Cognos
2.	Storage Infrastructure (Cloud)	Customer sales data is uploaded in cloud through interface	IBM Cloud
3.	Working with Dataset	Uploading, Cleaning and Processing dataset	IBM Cognos + IBM Cloud
4.	Data Exploration	Uploaded data is explored to identify trends	IBM Cognos
5.	Data Visualization	Multiple types of graphs are shown according to customer data and requirements	IBM Cognos Dashboard
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	Viewing Data	User logins to application to view visualizations for uploaded data	IBM Cognos Dashboard

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	IBM Cognos, IBM Cloud, IBM Watson
2.	Security Implementations	Secure user information and data	Active Directory
3.	Scalable Architecture	Supports various data sizes	Web 3.0 IBM Cloud
4.	Availability	Multi page layout providing various visualizations of data and provide full support irrespective of platform and device specifications	Cognos Business Intelligence Server
5.	Performance	Withstand huge data and process them without crashing	IBM Cognos, Performance Management Hub

5.3 User Stories

User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirmingmy password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login	Low	Sprint-2
		USN-4	As a user, I can register for the application through Gmail		Medium	Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password		High	Sprint-1
Customer (Web user)	Dashboard	USN-6	As a web user I can easily understand the data with the help of dashboard	I can get information from /on the web	Medium	Sprint-1
Customer Care Executive	Explored data	USN-7	A customer care executive can get a explored data.	I can get a sorted ,segmented data for certain category	high	Sprint-1
Administrator	Visualization data	USN-8	As administration I would like to analyse thedata of my company	I can easily make decision in my company development	high	Sprint-1

6. PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

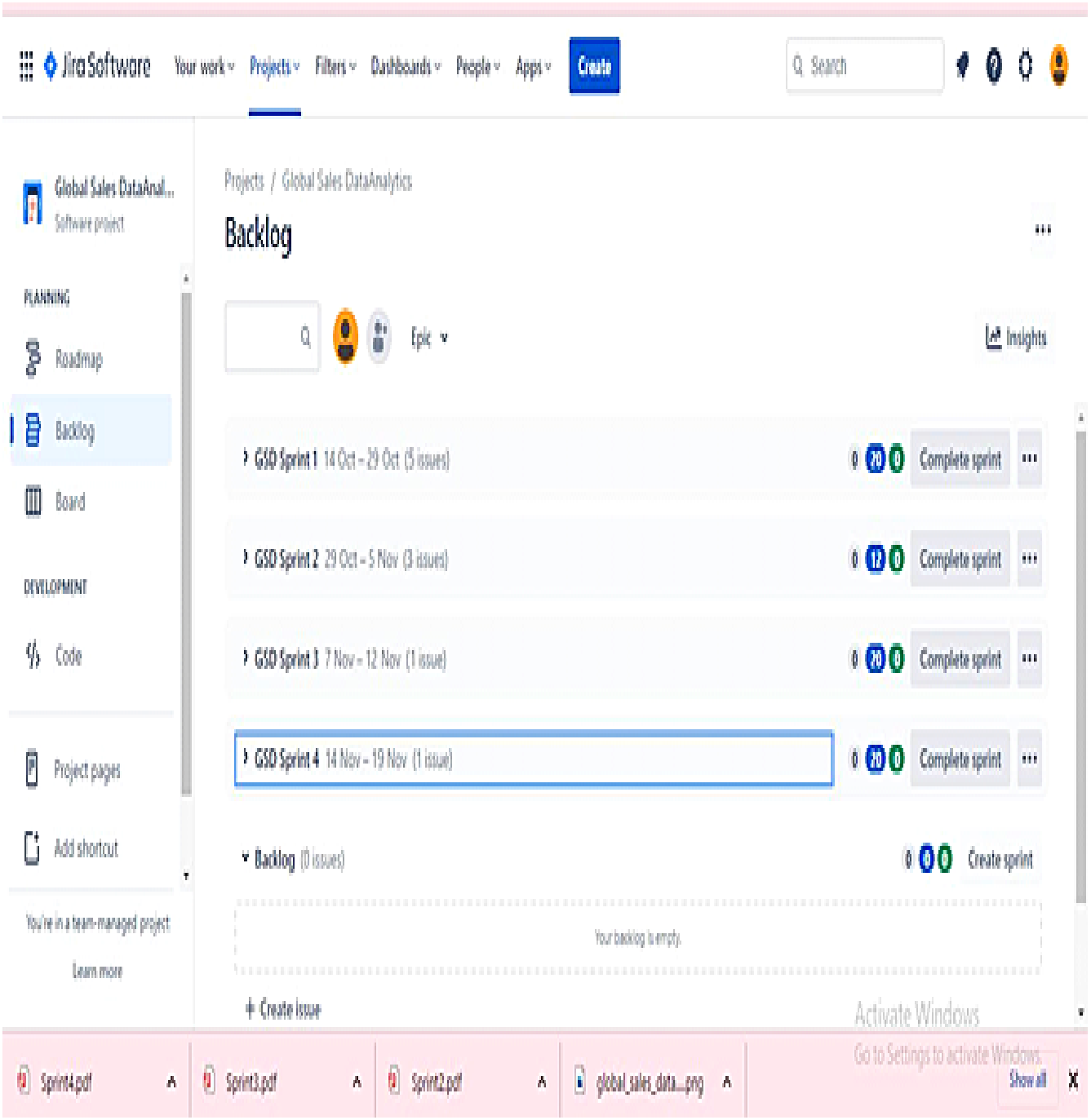
Sprint	Functional Requirement (Epic)	User Story Number	User Story /Task	Story Points	Priority	Team Member
Sprint-1	Registration (GitHub Account)	UNS-1	As a user, I can register for the website by entering my email, password, and confirming my password.	3	High	V.Bala Kumar, K.Karthick Raj
Sprint-1	Login (GitHub Account)	UNS-2	As a user, I will receive confirmation email once I have registered for the application	2	High	V.Bala Kumar, M.Ajith

Sprint-1	Collecting Dataset	UNS-3	As a user, I should share the data source for the dashboard	3	High	M.Ajith,V.Bala Kumar
Sprint-2	Understanding the data and Data Wrangling	USN – 4	As a data Analyst I should clean and detect anomalies in the dataset if it need.	3	High	M.Ajith,R.Amal
Sprint -3	Create Dashboard	USN – 5	As a data Analyst I need to perform data visualization and create a dashboard using BI tool	3	High	V.Bala Kumar,K.Karthick Raj
Sprint -3	Access Dashboard	USN -6	As a user, I can access my Sales Data Analytics Dashboard	3	High	V.Bala Kumar,K.Karthick Raj
Sprint -4	Exploratory Data Analysis and Feature Engineering	USN – 7	As a Data Analyst I should perform EDA to understand the data and feature engineer the data to improve the prediction.	3	High	M.Ajith,V.BalaKumar, K.Karthick Raj.
Sprint –4	Machine Learning	USN - 8	As a Data Analyst I should perform Predictions on the data to predict the sales.	1	High	M.Ajith,V.BalaKumar
Sprint - 4	Publish the Stories and Dashboards in the Git to allow the user to access.	USN - 9	As a Data Analyst, I should publish the dashboard and stories in the Git that can be accessed by the user from any device through internet.	3	High	V.Bala Kumar,K.Karthick Raj

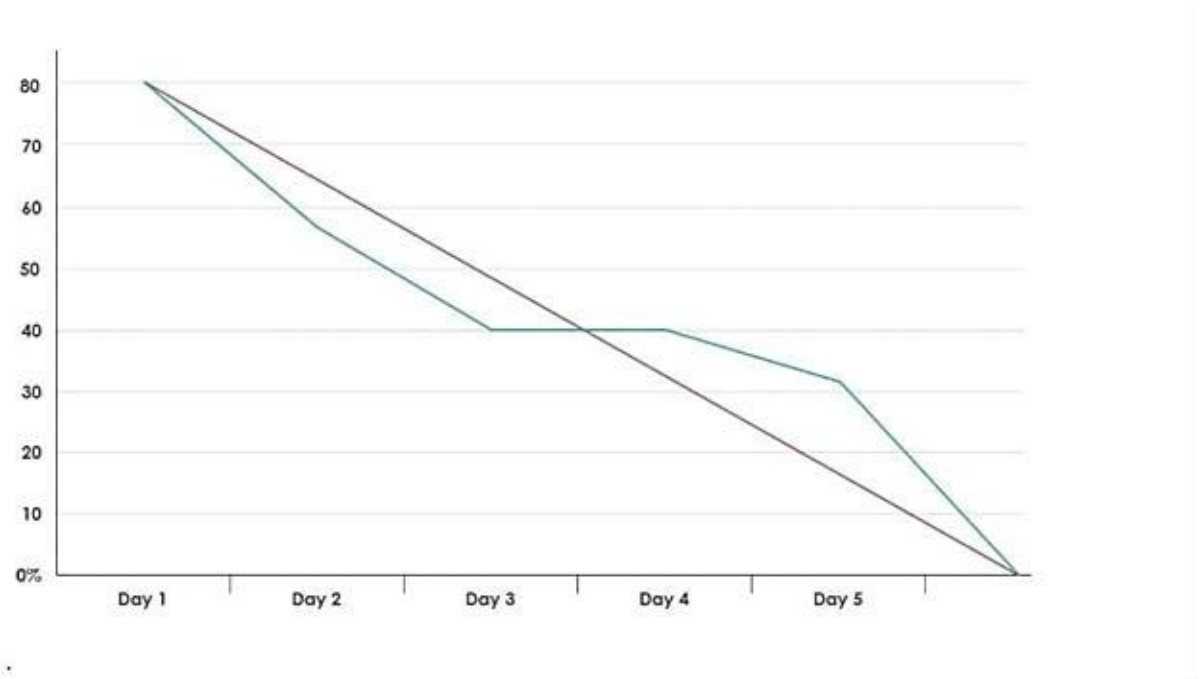
6.2 Sprint Delivery Schedule

Sprint	**Total Story Points**	**Duration**	**Sprint Start Date**	**Sprint End Date (Planned)**	**Story Points Completed (as on Planned End Date)**	**Sprint Release Date (Actual)**
Sprint-1	4	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	2	6 Days	31 Oct 2022	05 Nov 2022	20	06 Nov2022
Sprint-3	2	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov2022

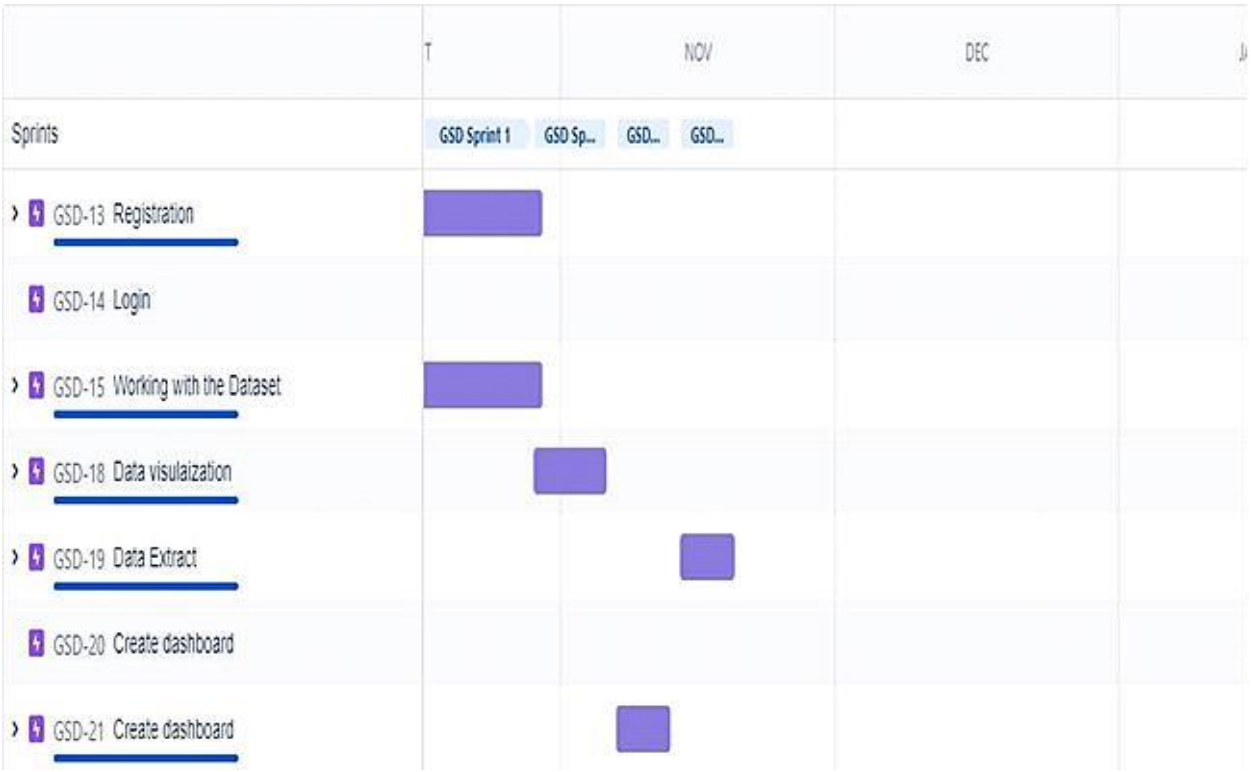
6.3 Reports from JIRA



Burndown chart :



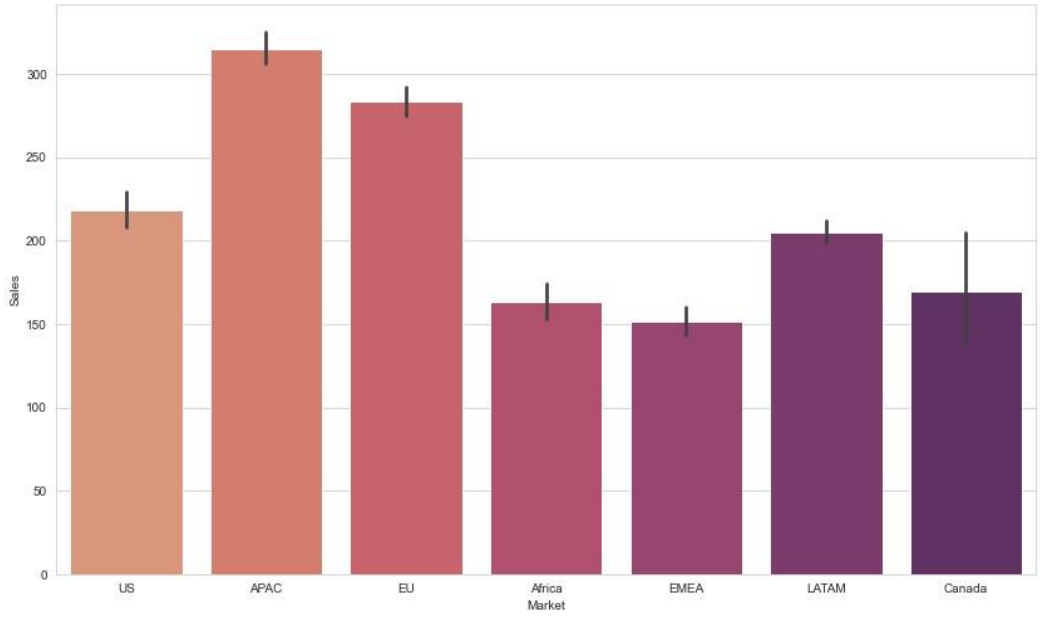
ROADSIDE MAP:



7. CODING & SOLUTIONING

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

In [72]:
```
plt.figure(figsize=(14,8))
sns.barplot(data=df,x='Market',y='Sales',palette='flare')
plt.show()
```



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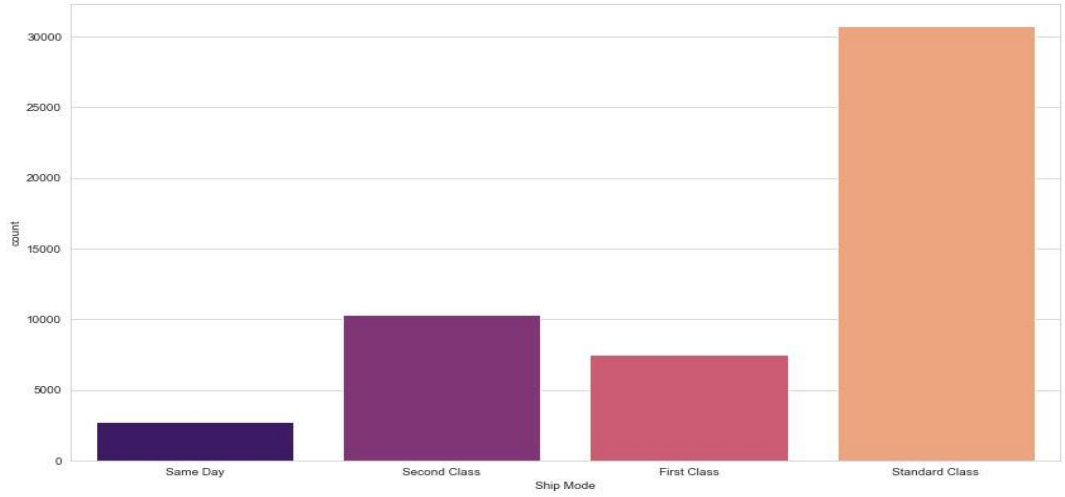
Sales

In [31]:
```
plt.figure(figsize=(14,8))
sns.countplot(data=df,x='Ship Mode',palette='magma')
plt.show()
```



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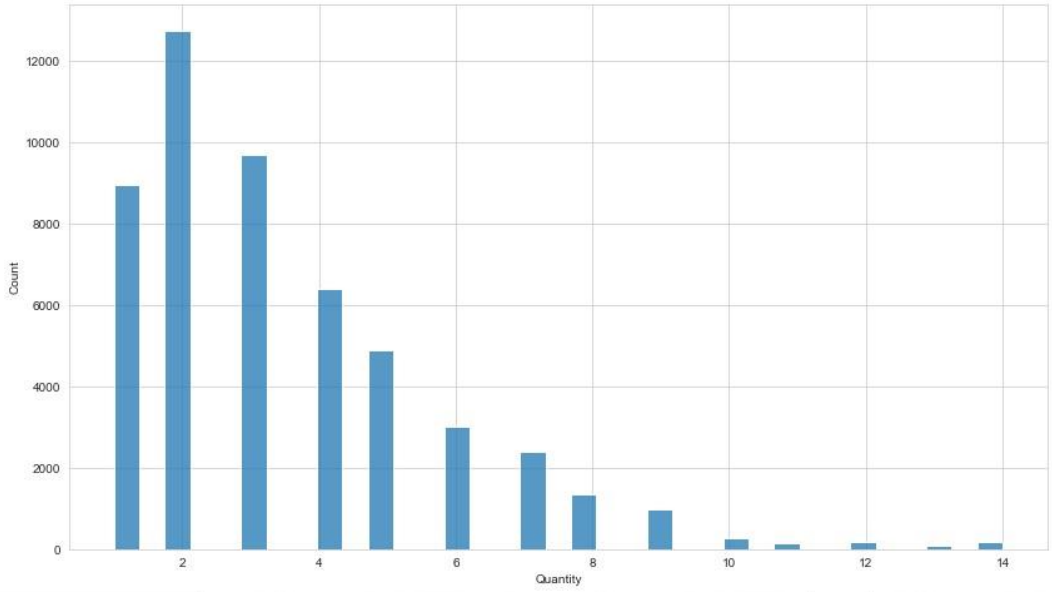
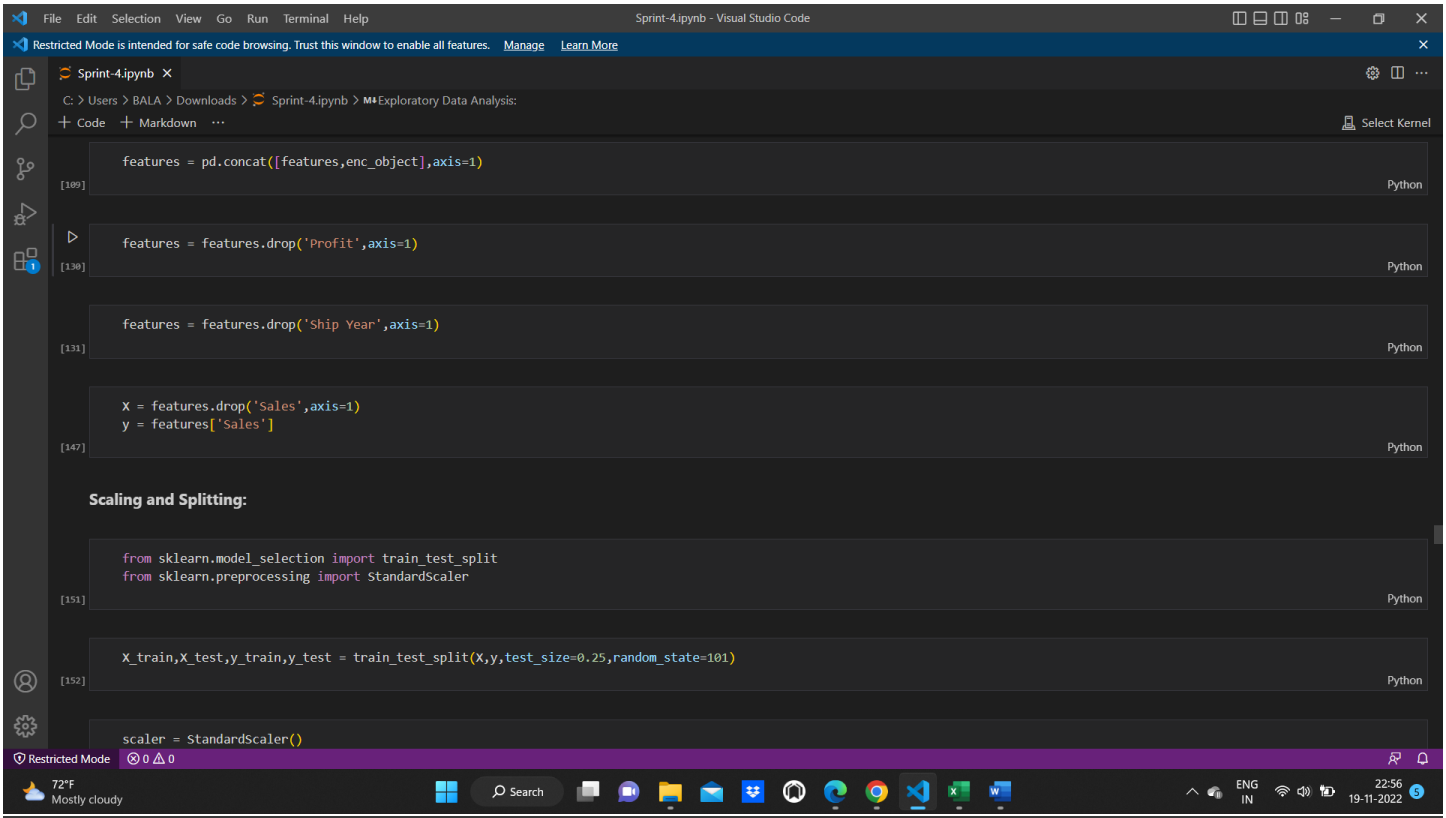
In [ ]:
```
```

In [17]:
```
plt.figure(figsize=(14,8))
sns.histplot(data=df,x='Quantity',bins=35)
plt.show()
```

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Sprint-4.ipynb
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Code Markdown
Select Kernel
features = pd.concat([features,enc_object],axis=1)
[109]
Python
features = features.drop('Profit',axis=1)
[130]
Python
features = features.drop('Ship Year',axis=1)
[131]
Python
X = features.drop('Sales',axis=1)
y = features['Sales']
[147]
Python
Scaling and Splitting:
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
[151]
Python
X_train,X_test,y_train,y_test = train_test_split(X,y,test_size=0.25,random_state=101)
[152]
Python
scaler = StandardScaler()
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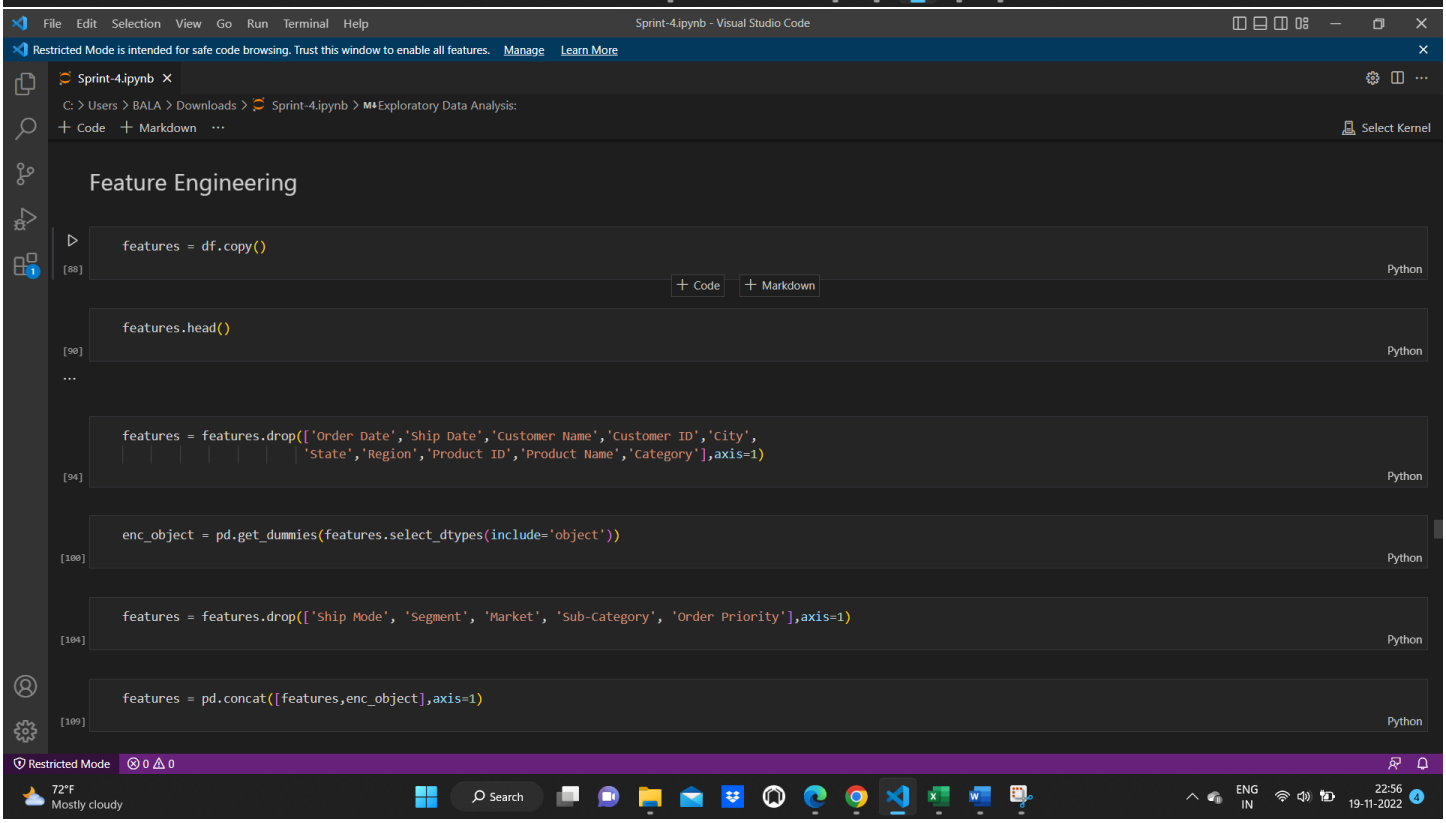
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Sprint-4.ipynb
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Code Markdown
Select Kernel
Feature Engineering
features = df.copy()
[88]
Python
Code Markdown
features.head()
[90]
Python
...
features = features.drop(['Order Date','Ship Date','Customer Name','Customer ID','City',
'State','Region','Product ID','Product Name','Category'],axis=1)
[94]
Python
enc_object = pd.get_dummies(features.select_dtypes(include='object'))
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features = features.drop(['Ship Mode', 'Segment', 'Market', 'Sub-Category', 'Order Priority'],axis=1)
[104]
Python
features = pd.concat([features,enc_object],axis=1)
[109]
Python
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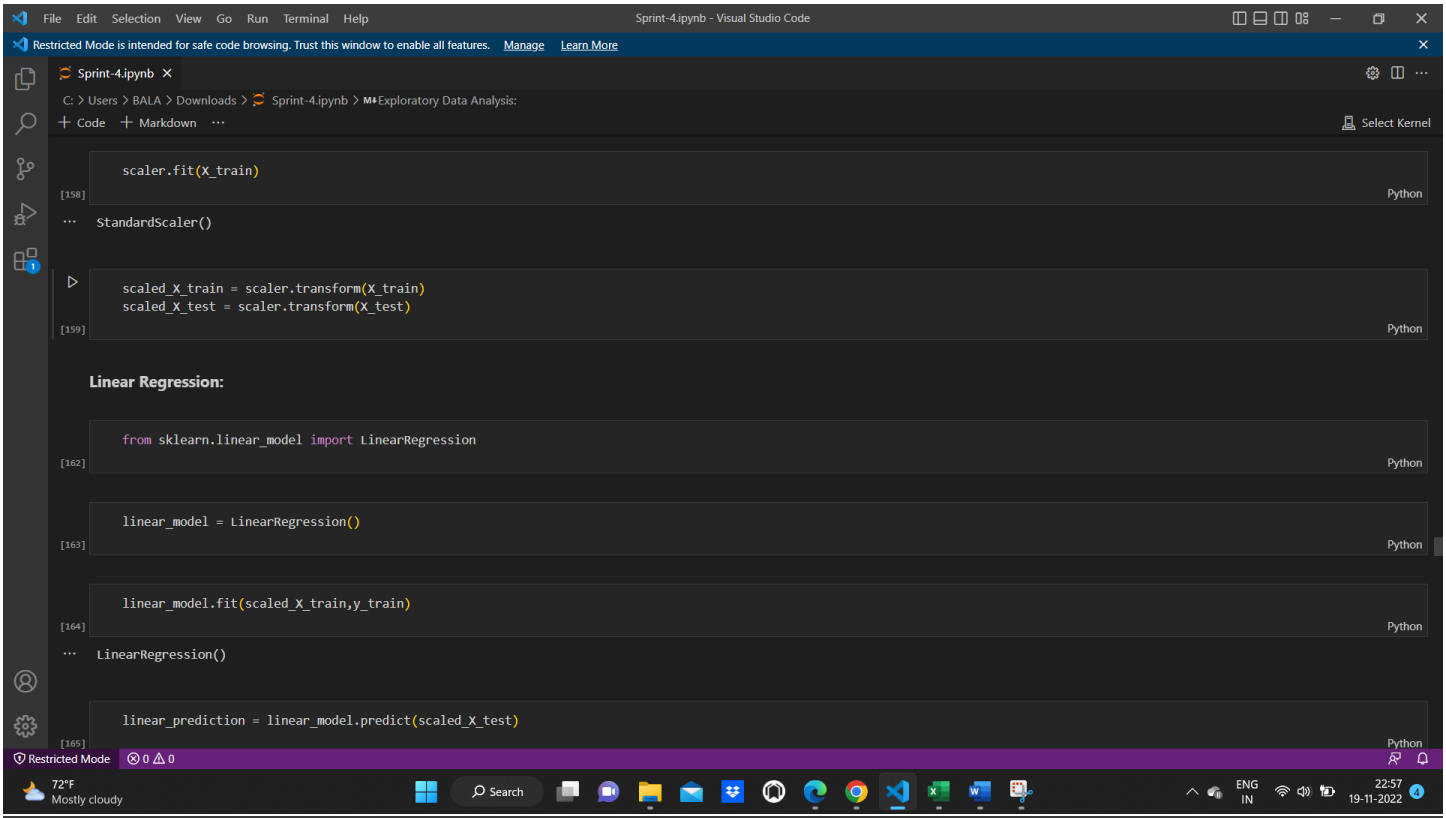
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Code Markdown
Select Kernel
scaler.fit(X_train)
[158]
Python
StandardScaler()
scaled_X_train = scaler.transform(X_train)
scaled_X_test = scaler.transform(X_test)
[159]
Python
Linear Regression:
from sklearn.linear_model import LinearRegression
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Python
linear_model = LinearRegression()
[163]
Python
linear_model.fit(scaled_X_train,y_train)
[164]
Python
LinearRegression()
linear_prediction = linear_model.predict(scaled_X_test)
[165]
Python
Restricted Mode
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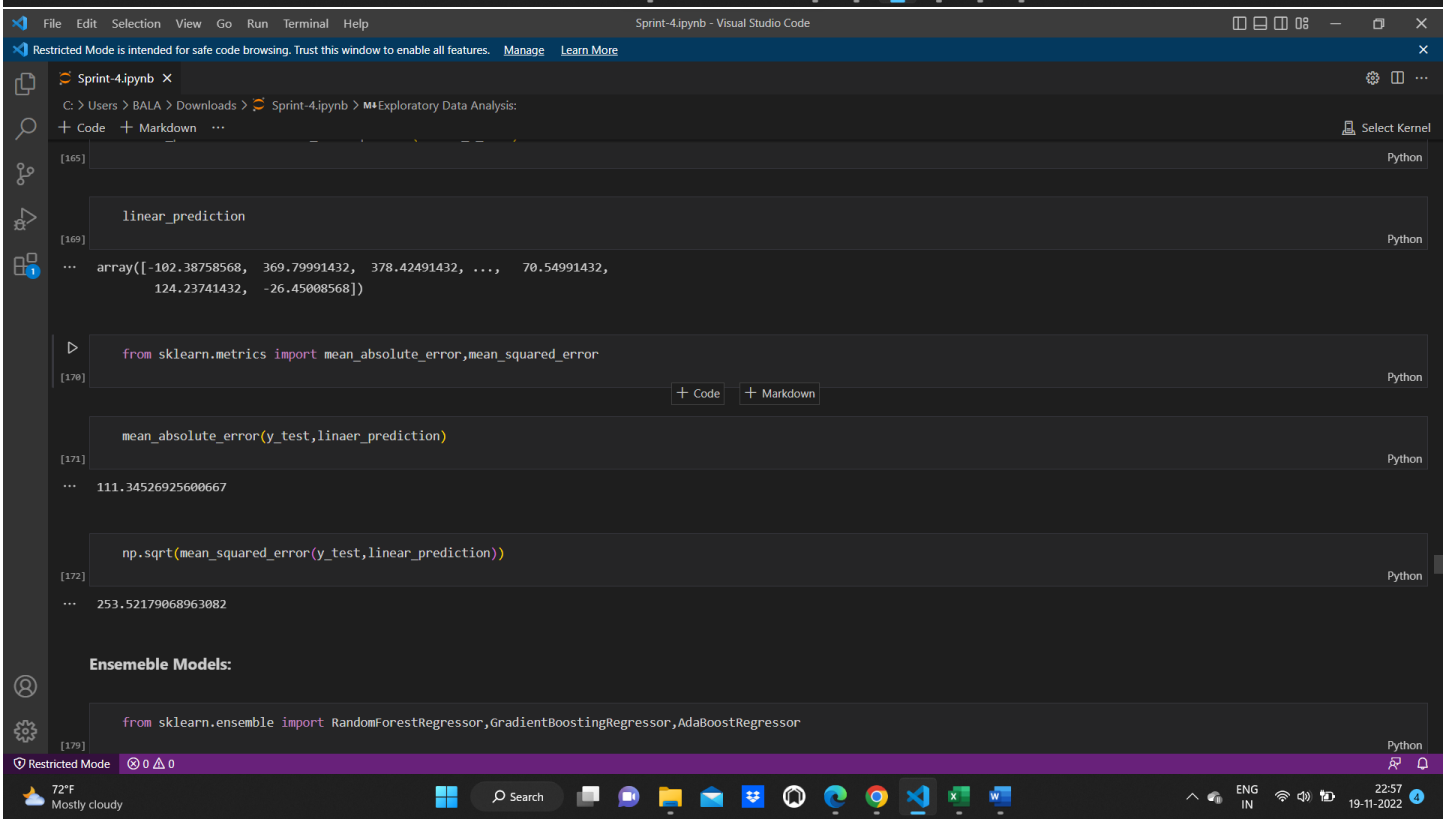
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Code Markdown
Select Kernel
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Python
linear_prediction
[169]
Python
array([-102.38758568, 369.79991432, 378.42491432, ..., 70.54991432,
124.23741432, -26.45008568])
from sklearn.metrics import mean_absolute_error,mean_squared_error
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Python
Code
Markdown
mean_absolute_error(y_test,linaer_prediction)
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np.sqrt(mean_squared_error(y_test,linear_prediction))
[172]
Python
253.52179068963082
Ensemeble Models:
from sklearn.ensemble import RandomForestRegressor,GradientBoostingRegressor,AdaBoostRegressor
[179]
Python
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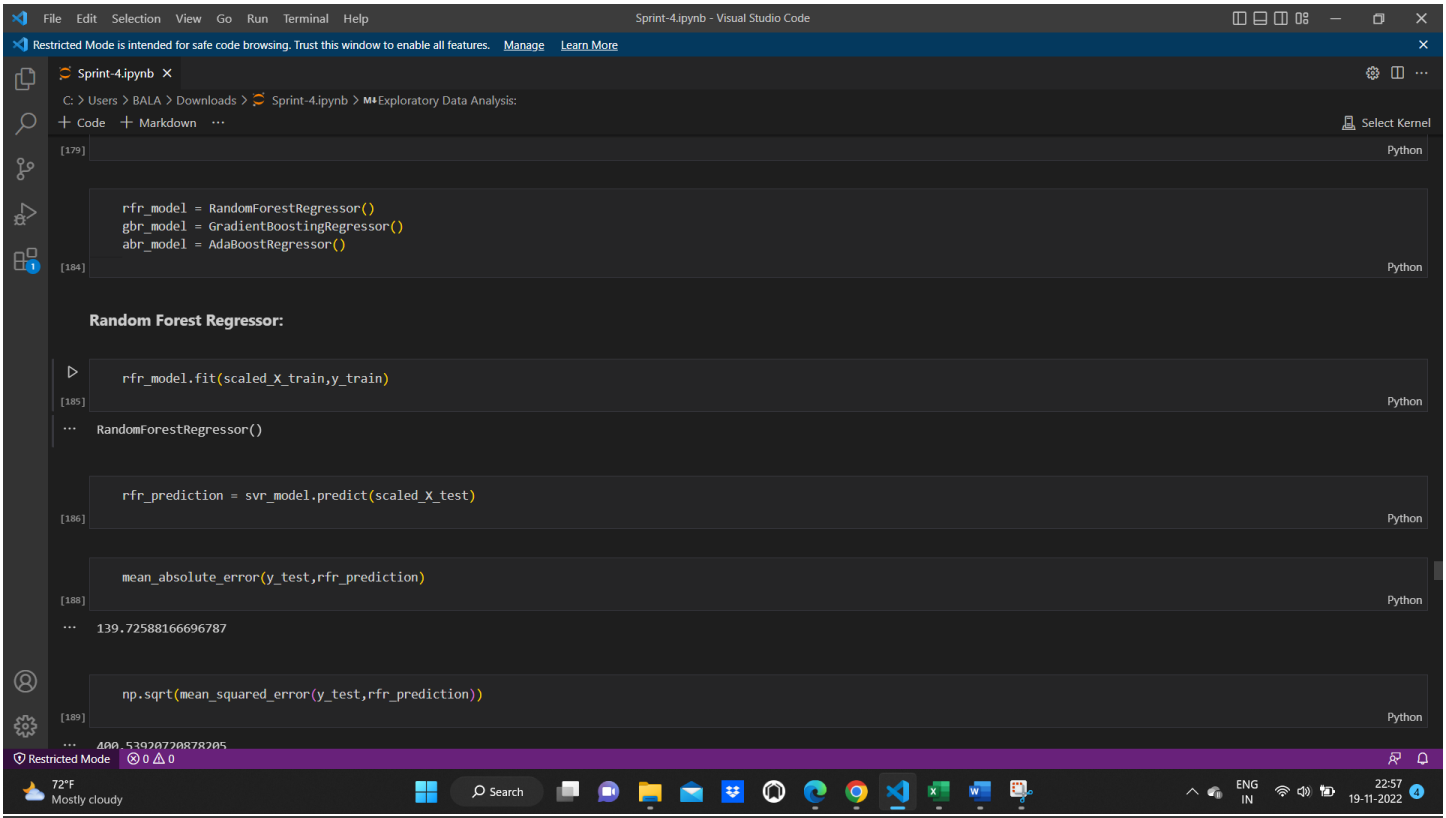
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+ Code + Markdown
Select Kernel
[179]
Python
rfr_model = RandomForestRegressor()
gbr_model = GradientBoostingRegressor()
abr_model = AdaBoostRegressor()
[184]
Python
Random Forest Regressor:
rfr_model.fit(scaled_X_train,y_train)
[185]
Python
RandomForestRegressor()
rfr_prediction = svr_model.predict(scaled_X_test)
[186]
Python
mean_absolute_error(y_test,rfr_prediction)
[188]
Python
139.72588166696787
np.sqrt(mean_squared_error(y_test,rfr_prediction))
[189]
Python
400.53920720878205
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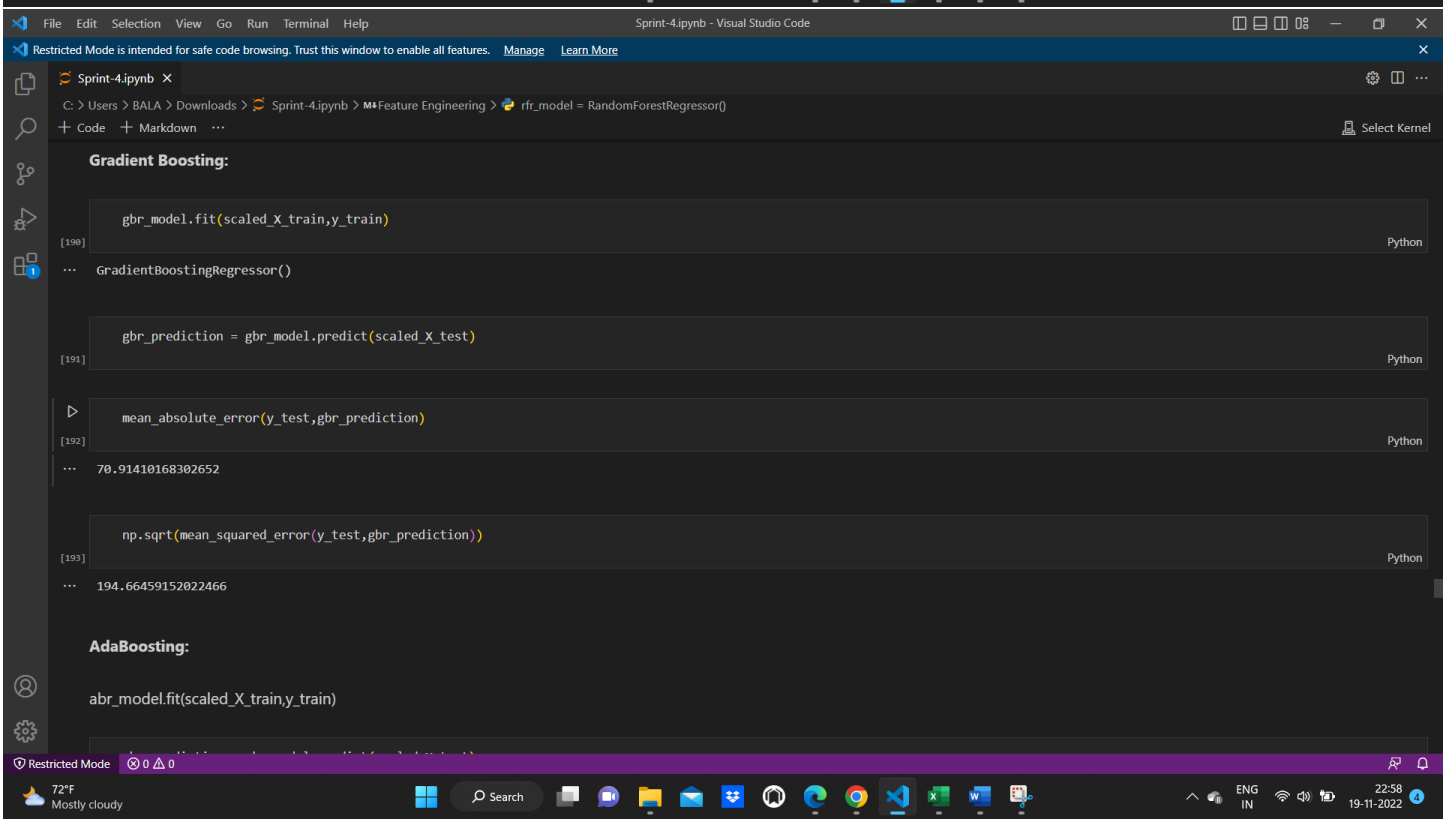
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+ Code + Markdown
Select Kernel
Gradient Boosting:
gbr_model.fit(scaled_X_train,y_train)
[190]
Python
GradientBoostingRegressor()
gbr_prediction = gbr_model.predict(scaled_X_test)
[191]
Python
mean_absolute_error(y_test,gbr_prediction)
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Python
70.91410168302652
np.sqrt(mean_squared_error(y_test,gbr_prediction))
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Python
194.66459152022466
AdaBoosting:
abr_model.fit(scaled_X_train,y_train)
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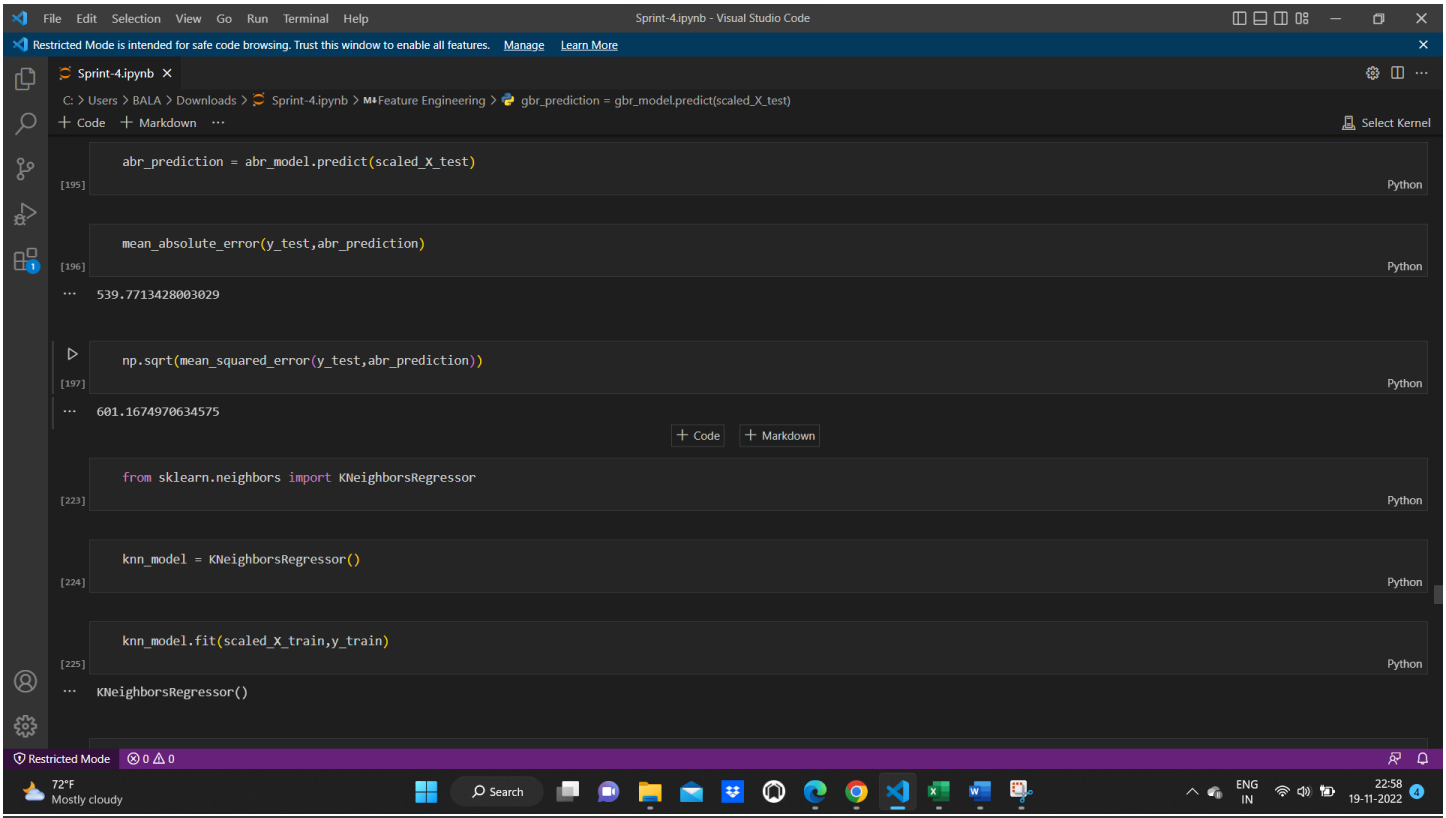
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Sprint-4.ipynb
C: > Users > BALA > Downloads > Sprint-4.ipynb > Feature Engineering > gbr_prediction = gbr_model.predict(scaled_X_test)
+ Code + Markdown
Select Kernel
[195] abr_prediction = abr_model.predict(scaled_X_test) Python
[196] mean_absolute_error(y_test,abr_prediction) Python
539.7713428003029
[197] np.sqrt(mean_squared_error(y_test,abr_prediction)) Python
601.1674970634575
+ Code + Markdown
[223] from sklearn.neighbors import KNeighborsRegressor Python
[224] knn_model = KNeighborsRegressor() Python
[225] knn_model.fit(scaled_X_train,y_train) Python
KNeighborsRegressor()
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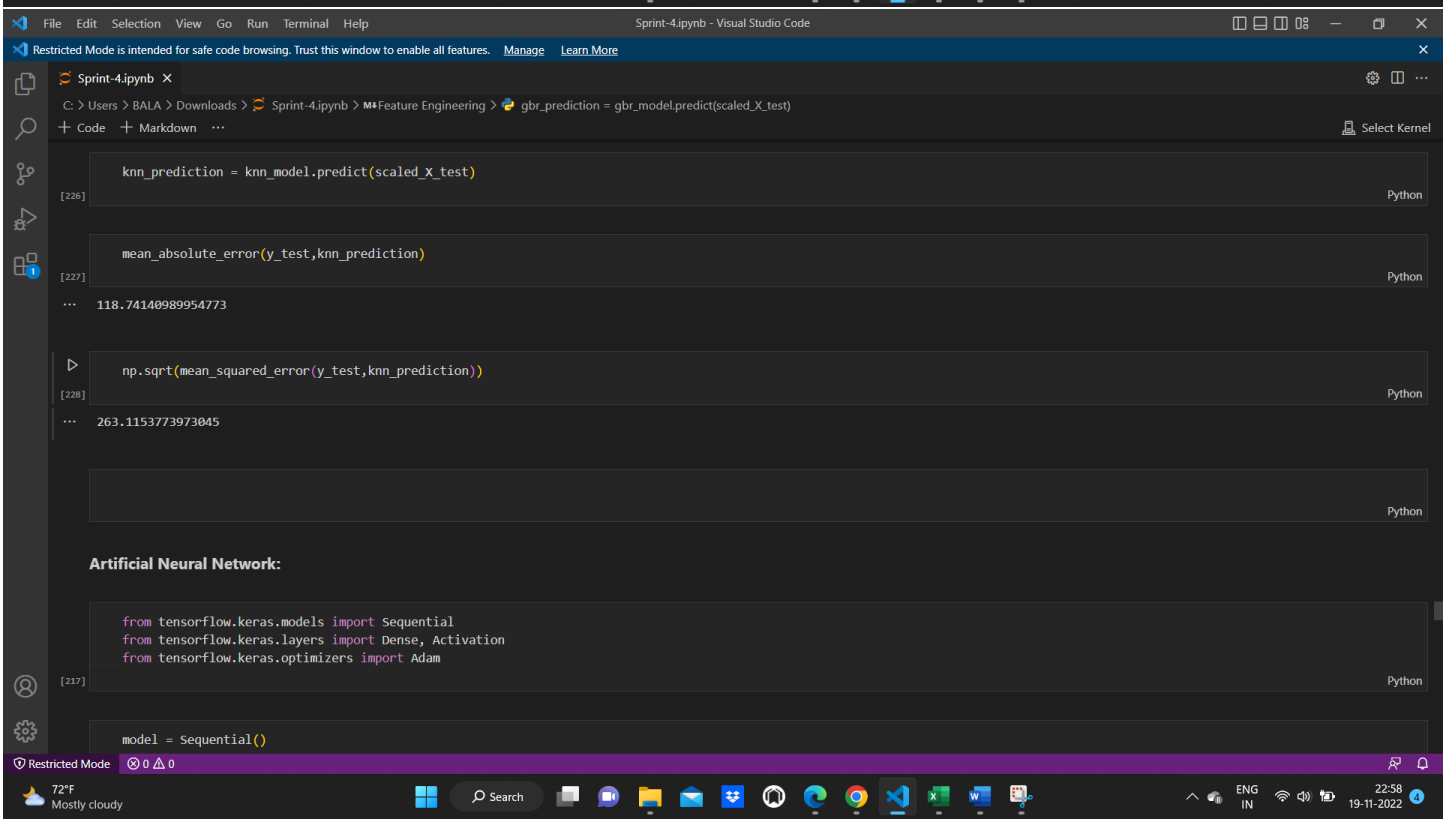
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C: > Users > BALA > Downloads > Sprint-4.ipynb > Feature Engineering > gbr_prediction = gbr_model.predict(scaled_X_test)
+ Code + Markdown
Select Kernel
[226] knn_prediction = knn_model.predict(scaled_X_test) Python
[227] mean_absolute_error(y_test,knn_prediction) Python
118.74140989954773
[228] np.sqrt(mean_squared_error(y_test,knn_prediction)) Python
263.1153773973045
Python
Artificial Neural Network:
[217] from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense, Activation
from tensorflow.keras.optimizers import Adam
Python
model = Sequential()
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+ Code + Markdown ··· Select Kernel

[217] Python

```
model = Sequential()

model.add(Dense(42,activation='relu'))
model.add(Dense(21,activation='relu'))
model.add(Dense(11,activation='relu'))
model.add(Dense(5,activation='relu'))
model.add(Dense(1))

model.compile(optimizer='adam',loss='mse')
```

[218] Python

```
model.fit(x=scaled_X_train,y=y_train.values,
          validation_data=(scaled_X_test,y_test.values),
          batch_size=128,epochs=1000)
```

[219] Python

```
··· Output exceeds the size limit. Open the full output data in a text editor
Epoch 1/1000
296/296 [==============================] - 9s 14ms/step - loss: 160136.5469 - val_loss: 84789.9219
Epoch 2/1000
296/296 [==============================] - 3s 10ms/step - loss: 61037.6133 - val_loss: 60895.8359
Epoch 3/1000
296/296 [==============================] - 2s 8ms/step - loss: 51171.1797 - val_loss: 55468.9805
Epoch 4/1000
296/296 [==============================] - 2s 7ms/step - loss: 48182.5742 - val_loss: 52447.8047
Epoch 5/1000
296/296 [==============================] - 2s 7ms/step - loss: 45648.5469 - val_loss: 49185.0469
Epoch 6/1000
```

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Sprint-4.ipynb

C: > Users > BALA > Downloads > Sprint-4.ipynb > Feature Engineering > model = Sequential()

+ Code + Markdown ··· Select Kernel

```
··· Output exceeds the size limit. Open the full output data in a text editor
Epoch 1/1000
296/296 [==============================] - 9s 14ms/step - loss: 160136.5469 - val_loss: 84789.9219
Epoch 2/1000
296/296 [==============================] - 3s 10ms/step - loss: 61037.6133 - val_loss: 60895.8359
Epoch 3/1000
296/296 [==============================] - 2s 8ms/step - loss: 51171.1797 - val_loss: 55468.9805
Epoch 4/1000
296/296 [==============================] - 2s 7ms/step - loss: 48182.5742 - val_loss: 52447.8047
Epoch 5/1000
296/296 [==============================] - 2s 7ms/step - loss: 45648.5469 - val_loss: 49185.0469
Epoch 6/1000
296/296 [==============================] - 2s 7ms/step - loss: 42661.1445 - val_loss: 45582.1484
Epoch 7/1000
296/296 [==============================] - 2s 7ms/step - loss: 39644.3359 - val_loss: 42780.3320
Epoch 8/1000
296/296 [==============================] - 2s 6ms/step - loss: 37612.5742 - val_loss: 41361.2344
Epoch 9/1000
296/296 [==============================] - 1s 5ms/step - loss: 36401.0117 - val_loss: 40192.7305
Epoch 10/1000
296/296 [==============================] - 1s 5ms/step - loss: 35528.5586 - val_loss: 39433.4141
Epoch 11/1000
296/296 [==============================] - 1s 5ms/step - loss: 35160.7383 - val_loss: 39083.6602
Epoch 12/1000
296/296 [==============================] - 1s 5ms/step - loss: 34560.8867 - val_loss: 38739.5195
Epoch 13/1000
...
Epoch 73/1000
296/296 [==============================] - 1s 5ms/step - loss: 29208.2715 - val_loss: 33840.6172
```

Restricted Mode ⊗0 ⚠0

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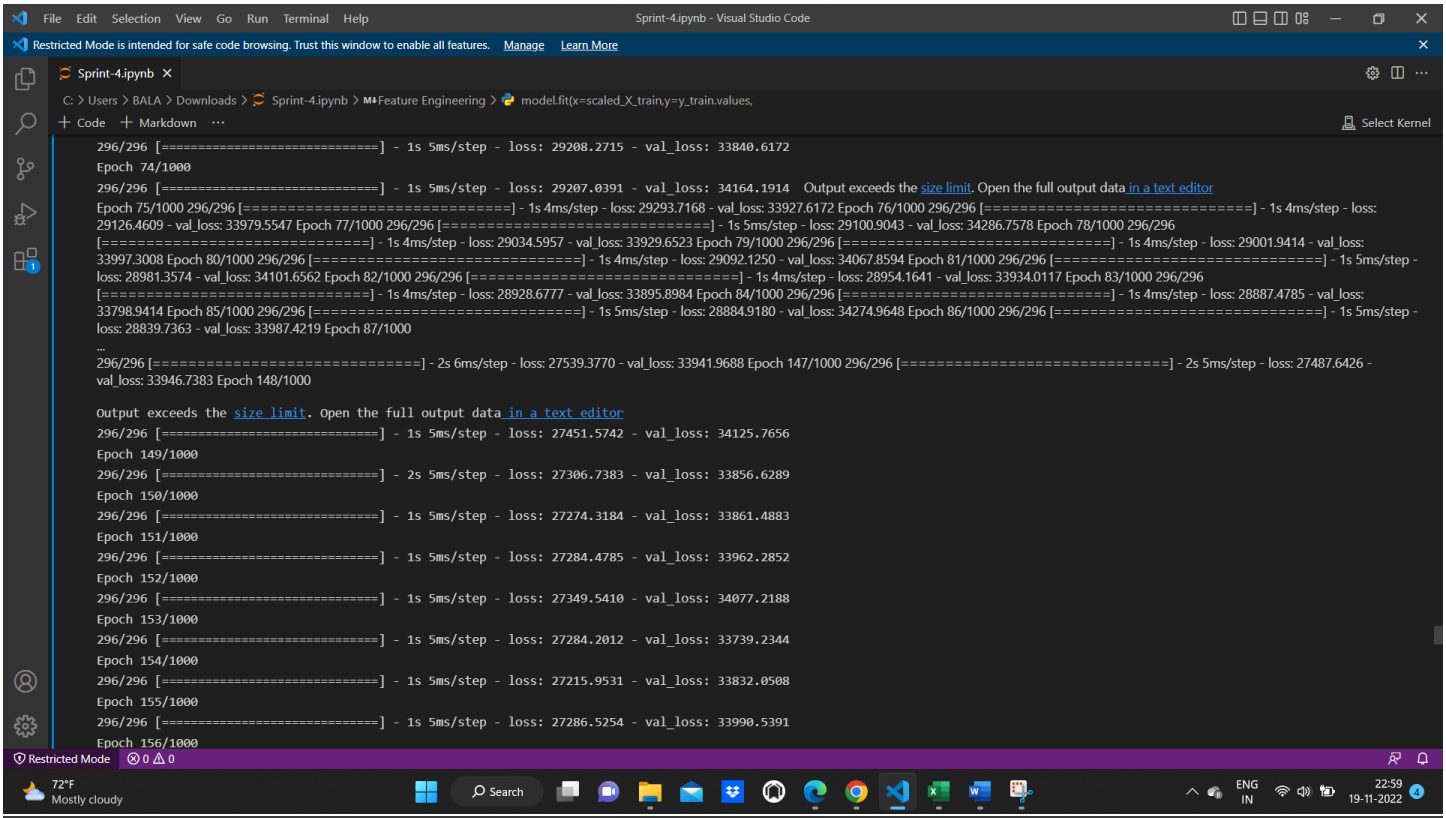
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C: > Users > BALA > Downloads > Sprint-4.ipynb > Feature Engineering > model.fit(x=scaled_X_train,y=y_train.values,
Code Markdown
Select Kernel
296/296 [==========] - 1s 5ms/step - loss: 29208.2715 - val_loss: 33840.6172
Epoch 74/1000
296/296 [==========] - 1s 5ms/step - loss: 29207.0391 - val_loss: 34164.1914 Output exceeds the size limit. Open the full output data in a text editor
Epoch 75/1000 296/296 [==========] - 1s 4ms/step - loss: 29293.7168 - val_loss: 33927.6172 Epoch 76/1000 296/296 [==========] - 1s 4ms/step - loss: 29126.4609 - val_loss: 33979.5547 Epoch 77/1000 296/296 [==========] - 1s 5ms/step - loss: 29100.9043 - val_loss: 34286.7578 Epoch 78/1000 296/296 [==========] - 1s 4ms/step - loss: 29034.5957 - val_loss: 33929.6523 Epoch 79/1000 296/296 [==========] - 1s 4ms/step - loss: 29001.9414 - val_loss: 33997.3008 Epoch 80/1000 296/296 [==========] - 1s 4ms/step - loss: 29092.1250 - val_loss: 34067.8594 Epoch 81/1000 296/296 [==========] - 1s 5ms/step - loss: 28981.3574 - val_loss: 34101.6562 Epoch 82/1000 296/296 [==========] - 1s 4ms/step - loss: 28954.1641 - val_loss: 33934.0117 Epoch 83/1000 296/296 [==========] - 1s 4ms/step - loss: 28928.6777 - val_loss: 33895.8984 Epoch 84/1000 296/296 [==========] - 1s 4ms/step - loss: 28887.4785 - val_loss: 33798.9414 Epoch 85/1000 296/296 [==========] - 1s 5ms/step - loss: 28884.9180 - val_loss: 34274.9648 Epoch 86/1000 296/296 [==========] - 1s 5ms/step - loss: 28839.7363 - val_loss: 33987.4219 Epoch 87/1000
...
296/296 [==========] - 2s 6ms/step - loss: 27539.3770 - val_loss: 33941.9688 Epoch 147/1000 296/296 [==========] - 2s 5ms/step - loss: 27487.6426 - val_loss: 33946.7383 Epoch 148/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 5ms/step - loss: 27451.5742 - val_loss: 34125.7656
Epoch 149/1000
296/296 [==========] - 2s 5ms/step - loss: 27306.7383 - val_loss: 33856.6289
Epoch 150/1000
296/296 [==========] - 1s 5ms/step - loss: 27274.3184 - val_loss: 33861.4883
Epoch 151/1000
296/296 [==========] - 1s 5ms/step - loss: 27284.4785 - val_loss: 33962.2852
Epoch 152/1000
296/296 [==========] - 1s 5ms/step - loss: 27349.5410 - val_loss: 34077.2188
Epoch 153/1000
296/296 [==========] - 1s 5ms/step - loss: 27284.2012 - val_loss: 33739.2344
Epoch 154/1000
296/296 [==========] - 1s 5ms/step - loss: 27215.9531 - val_loss: 33832.0508
Epoch 155/1000
296/296 [==========] - 1s 5ms/step - loss: 27286.5254 - val_loss: 33990.5391
Epoch 156/1000
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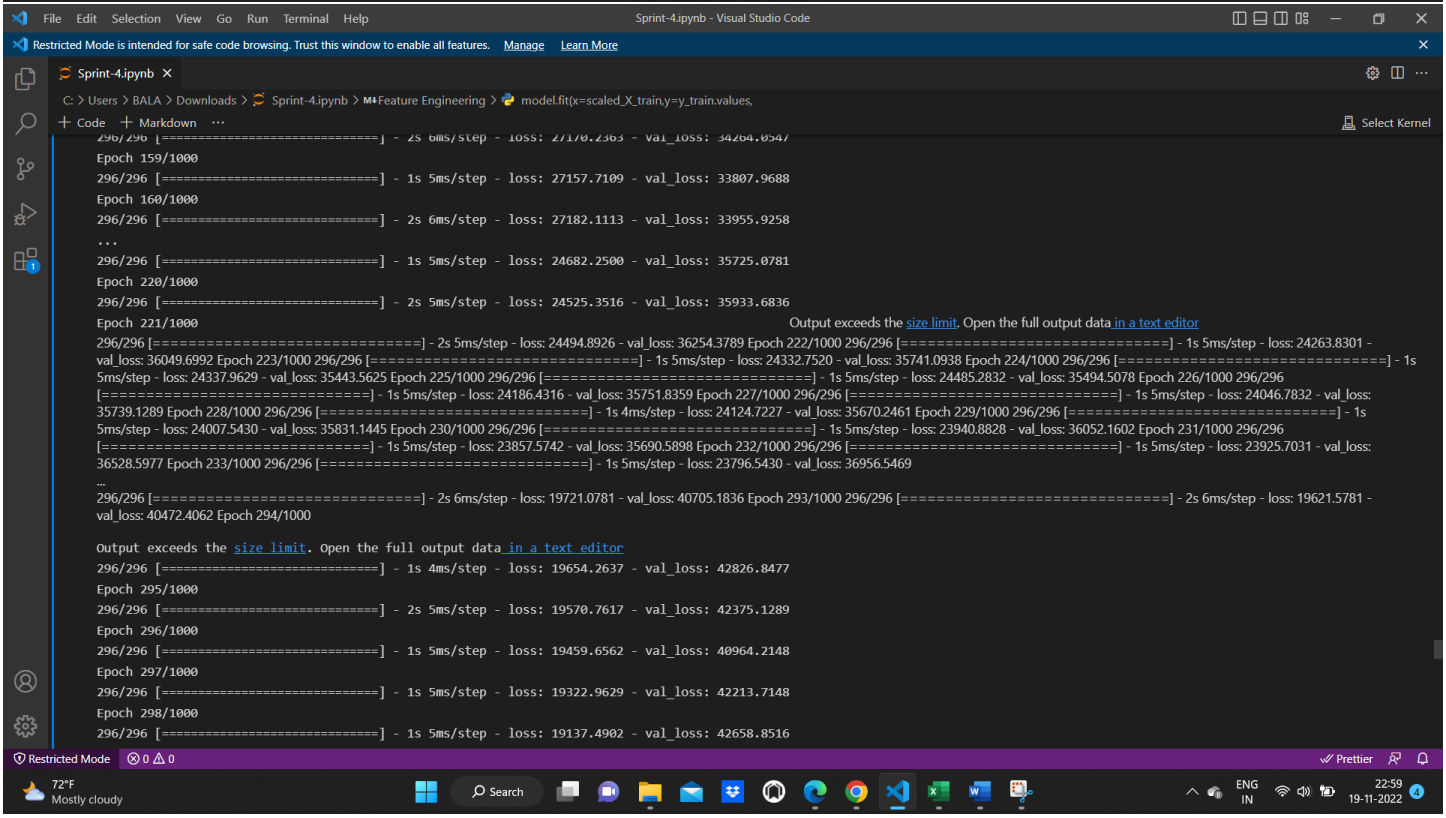
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Code Markdown
Select Kernel
Epoch 159/1000
296/296 [==========] - 1s 5ms/step - loss: 27157.7109 - val_loss: 33807.9688
Epoch 160/1000
296/296 [==========] - 2s 6ms/step - loss: 27182.1113 - val_loss: 33955.9258
...
296/296 [==========] - 1s 5ms/step - loss: 24682.2500 - val_loss: 35725.0781
Epoch 220/1000
296/296 [==========] - 2s 5ms/step - loss: 24525.3516 - val_loss: 35933.6836
Epoch 221/1000 Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 2s 5ms/step - loss: 24494.8926 - val_loss: 36254.3789 Epoch 222/1000 296/296 [==========] - 1s 5ms/step - loss: 24263.8301 - val_loss: 36049.6992 Epoch 223/1000 296/296 [==========] - 1s 5ms/step - loss: 24332.7520 - val_loss: 35741.0938 Epoch 224/1000 296/296 [==========] - 1s 5ms/step - loss: 24337.9629 - val_loss: 35443.5625 Epoch 225/1000 296/296 [==========] - 1s 5ms/step - loss: 24485.2832 - val_loss: 35494.5078 Epoch 226/1000 296/296 [==========] - 1s 5ms/step - loss: 24186.4316 - val_loss: 35751.8359 Epoch 227/1000 296/296 [==========] - 1s 5ms/step - loss: 24046.7832 - val_loss: 35739.1289 Epoch 228/1000 296/296 [==========] - 1s 4ms/step - loss: 24124.7227 - val_loss: 35670.2461 Epoch 229/1000 296/296 [==========] - 1s 5ms/step - loss: 24007.5430 - val_loss: 35831.1445 Epoch 230/1000 296/296 [==========] - 1s 5ms/step - loss: 23940.8828 - val_loss: 36052.1602 Epoch 231/1000 296/296 [==========] - 1s 5ms/step - loss: 23857.5742 - val_loss: 35690.5898 Epoch 232/1000 296/296 [==========] - 1s 5ms/step - loss: 23925.7031 - val_loss: 36528.5977 Epoch 233/1000 296/296 [==========] - 1s 5ms/step - loss: 23796.5430 - val_loss: 36956.5469
...
296/296 [==========] - 2s 6ms/step - loss: 19721.0781 - val_loss: 40705.1836 Epoch 293/1000 296/296 [==========] - 2s 6ms/step - loss: 19621.5781 - val_loss: 40472.4062 Epoch 294/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 4ms/step - loss: 19654.2637 - val_loss: 42826.8477
Epoch 295/1000
296/296 [==========] - 2s 5ms/step - loss: 19570.7617 - val_loss: 42375.1289
Epoch 296/1000
296/296 [==========] - 1s 5ms/step - loss: 19459.6562 - val_loss: 40964.2148
Epoch 297/1000
296/296 [==========] - 1s 5ms/step - loss: 19322.9629 - val_loss: 42213.7148
Epoch 298/1000
296/296 [==========] - 1s 5ms/step - loss: 19137.4902 - val_loss: 42658.8516
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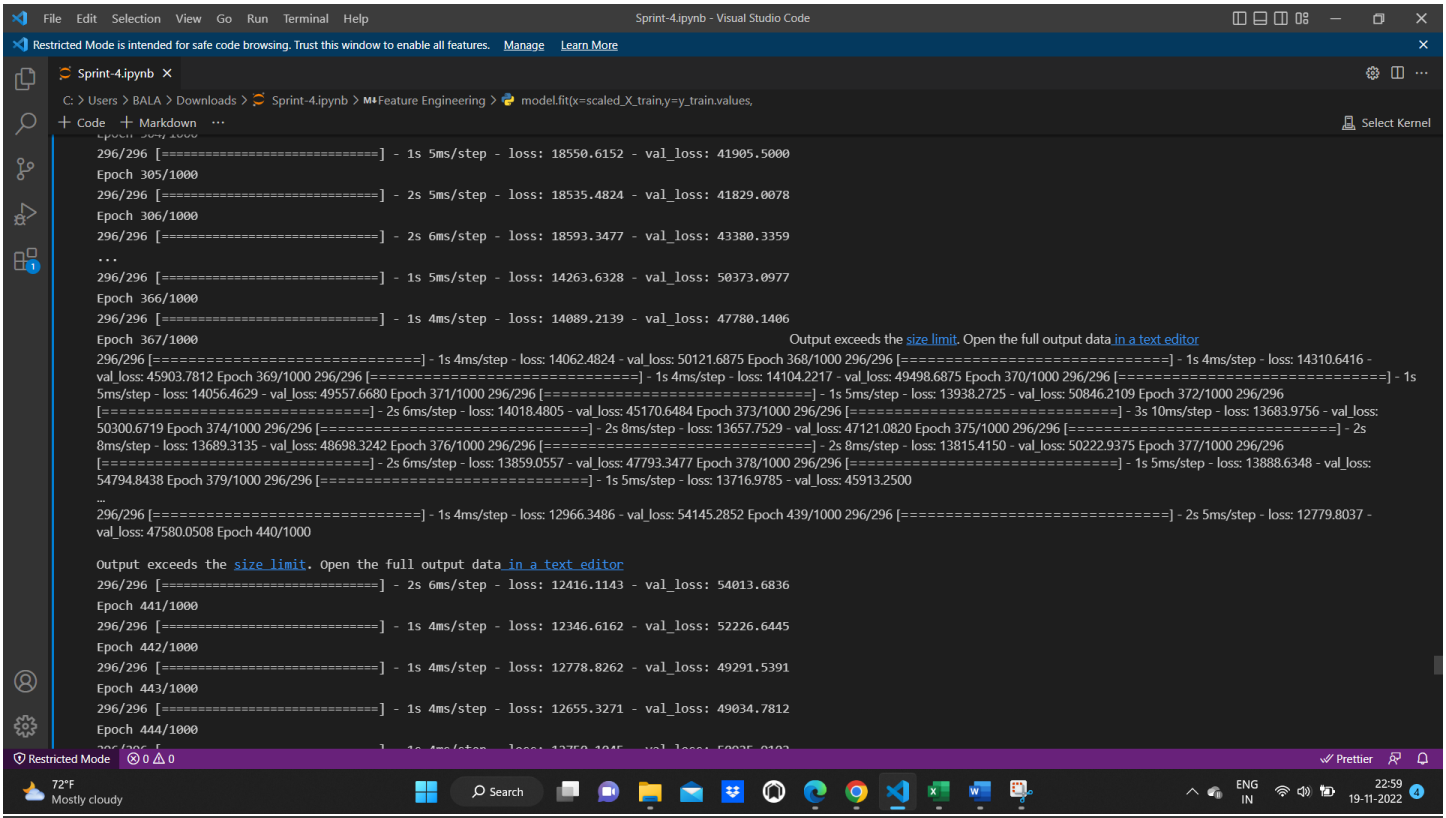
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Code Markdown
Select Kernel
296/296 [==========] - 1s 5ms/step - loss: 18550.6152 - val_loss: 41905.5000
Epoch 305/1000
296/296 [==========] - 2s 5ms/step - loss: 18535.4824 - val_loss: 41829.0078
Epoch 306/1000
296/296 [==========] - 2s 6ms/step - loss: 18593.3477 - val_loss: 43380.3359
...
296/296 [==========] - 1s 5ms/step - loss: 14263.6328 - val_loss: 50373.0977
Epoch 366/1000
296/296 [==========] - 1s 4ms/step - loss: 14089.2139 - val_loss: 47780.1406
Epoch 367/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 4ms/step - loss: 14062.4824 - val_loss: 50121.6875 Epoch 368/1000 296/296 [==========] - 1s 4ms/step - loss: 14310.6416 - val_loss: 45903.7812 Epoch 369/1000 296/296 [==========] - 1s 4ms/step - loss: 14104.2217 - val_loss: 49498.6875 Epoch 370/1000 296/296 [==========] - 1s 5ms/step - loss: 14056.4629 - val_loss: 49557.6680 Epoch 371/1000 296/296 [==========] - 1s 5ms/step - loss: 13938.2725 - val_loss: 50846.2109 Epoch 372/1000 296/296 [==========] - 2s 6ms/step - loss: 14018.4805 - val_loss: 45170.6484 Epoch 373/1000 296/296 [==========] - 3s 10ms/step - loss: 13683.9756 - val_loss: 50300.6719 Epoch 374/1000 296/296 [==========] - 2s 8ms/step - loss: 13657.7529 - val_loss: 47121.0820 Epoch 375/1000 296/296 [==========] - 2s 8ms/step - loss: 13689.3135 - val_loss: 48698.3242 Epoch 376/1000 296/296 [==========] - 2s 8ms/step - loss: 13815.4150 - val_loss: 50222.9375 Epoch 377/1000 296/296 [==========] - 2s 6ms/step - loss: 13859.0557 - val_loss: 47793.3477 Epoch 378/1000 296/296 [==========] - 1s 5ms/step - loss: 13888.6348 - val_loss: 54794.8438 Epoch 379/1000 296/296 [==========] - 1s 5ms/step - loss: 13716.9785 - val_loss: 45913.2500
...
296/296 [==========] - 1s 4ms/step - loss: 12966.3486 - val_loss: 54145.2852 Epoch 439/1000 296/296 [==========] - 2s 5ms/step - loss: 12779.8037 - val_loss: 47580.0508 Epoch 440/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 2s 6ms/step - loss: 12416.1143 - val_loss: 54013.6836
Epoch 441/1000
296/296 [==========] - 1s 4ms/step - loss: 12346.6162 - val_loss: 52226.6445
Epoch 442/1000
296/296 [==========] - 1s 4ms/step - loss: 12778.8262 - val_loss: 49291.5391
Epoch 443/1000
296/296 [==========] - 1s 4ms/step - loss: 12655.3271 - val_loss: 49034.7812
Epoch 444/1000
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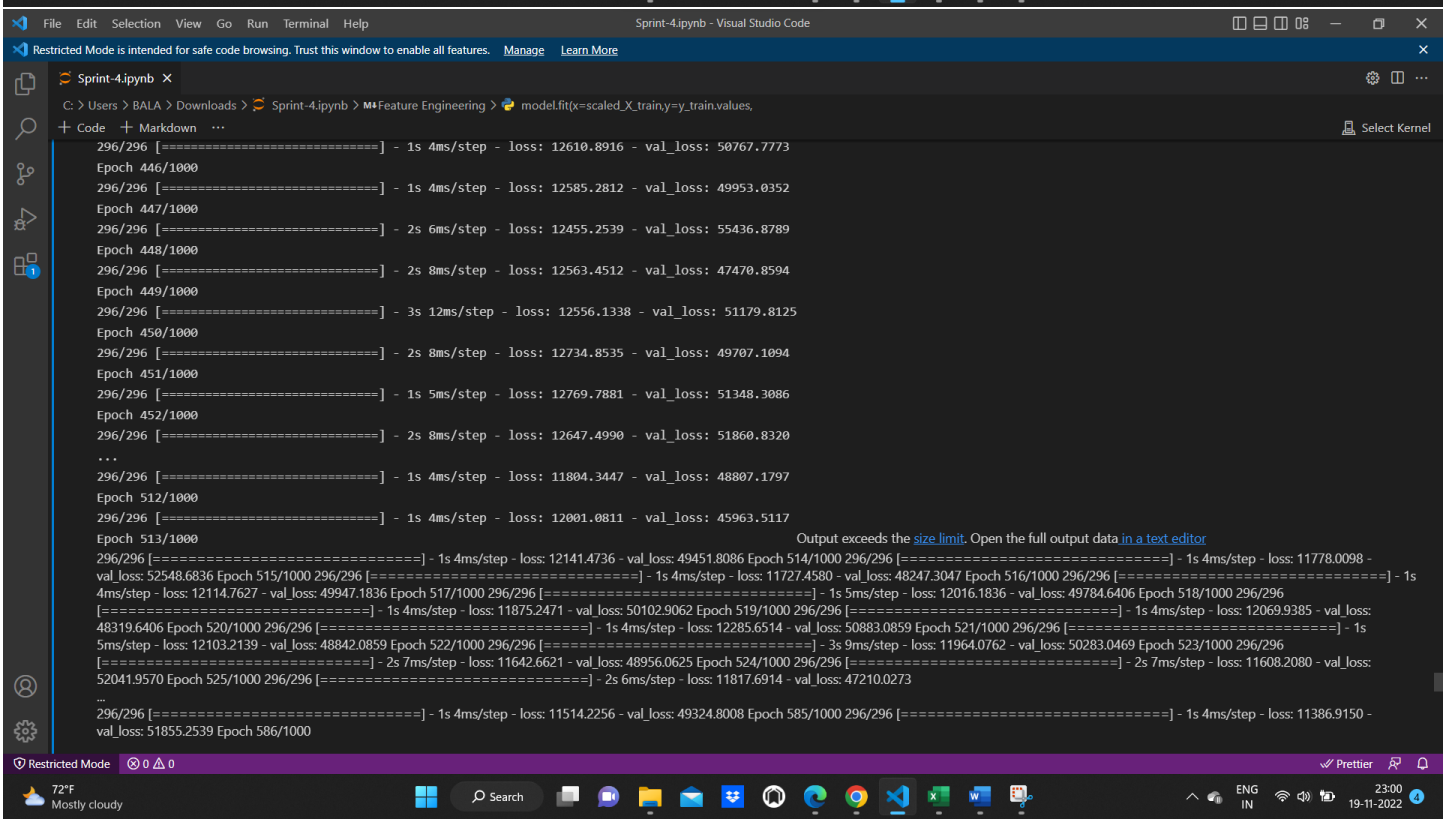
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C: > Users > BALA > Downloads > Sprint-4.ipynb > Feature Engineering > model.fit(x=scaled_X_train,y=y_train.values,
Code Markdown
Select Kernel
296/296 [==========] - 1s 4ms/step - loss: 12610.8916 - val_loss: 50767.7773
Epoch 446/1000
296/296 [==========] - 1s 4ms/step - loss: 12585.2812 - val_loss: 49953.0352
Epoch 447/1000
296/296 [==========] - 2s 6ms/step - loss: 12455.2539 - val_loss: 55436.8789
Epoch 448/1000
296/296 [==========] - 2s 8ms/step - loss: 12563.4512 - val_loss: 47470.8594
Epoch 449/1000
296/296 [==========] - 3s 12ms/step - loss: 12556.1338 - val_loss: 51179.8125
Epoch 450/1000
296/296 [==========] - 2s 8ms/step - loss: 12734.8535 - val_loss: 49707.1094
Epoch 451/1000
296/296 [==========] - 1s 5ms/step - loss: 12769.7881 - val_loss: 51348.3086
Epoch 452/1000
296/296 [==========] - 2s 8ms/step - loss: 12647.4990 - val_loss: 51860.8320
...
296/296 [==========] - 1s 4ms/step - loss: 11804.3447 - val_loss: 48807.1797
Epoch 512/1000
296/296 [==========] - 1s 4ms/step - loss: 12001.0811 - val_loss: 45963.5117
Epoch 513/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 4ms/step - loss: 12141.4736 - val_loss: 49451.8086 Epoch 514/1000 296/296 [==========] - 1s 4ms/step - loss: 11778.0098 - val_loss: 52548.6836 Epoch 515/1000 296/296 [==========] - 1s 4ms/step - loss: 11727.4580 - val_loss: 48247.3047 Epoch 516/1000 296/296 [==========] - 1s 4ms/step - loss: 12114.7627 - val_loss: 49947.1836 Epoch 517/1000 296/296 [==========] - 1s 5ms/step - loss: 12016.1836 - val_loss: 49784.6406 Epoch 518/1000 296/296 [==========] - 1s 4ms/step - loss: 11875.2471 - val_loss: 50102.9062 Epoch 519/1000 296/296 [==========] - 1s 4ms/step - loss: 12069.9385 - val_loss: 48319.6406 Epoch 520/1000 296/296 [==========] - 1s 4ms/step - loss: 12285.6514 - val_loss: 50883.0859 Epoch 521/1000 296/296 [==========] - 1s 5ms/step - loss: 12103.2139 - val_loss: 48842.0859 Epoch 522/1000 296/296 [==========] - 3s 9ms/step - loss: 11964.0762 - val_loss: 50283.0469 Epoch 523/1000 296/296 [==========] - 2s 7ms/step - loss: 11642.6621 - val_loss: 48956.0625 Epoch 524/1000 296/296 [==========] - 2s 7ms/step - loss: 11608.2080 - val_loss: 52041.9570 Epoch 525/1000 296/296 [==========] - 2s 6ms/step - loss: 11817.6914 - val_loss: 47210.0273
...
296/296 [==========] - 1s 4ms/step - loss: 11514.2256 - val_loss: 49324.8008 Epoch 585/1000 296/296 [==========] - 1s 4ms/step - loss: 11386.9150 - val_loss: 51855.2539 Epoch 586/1000
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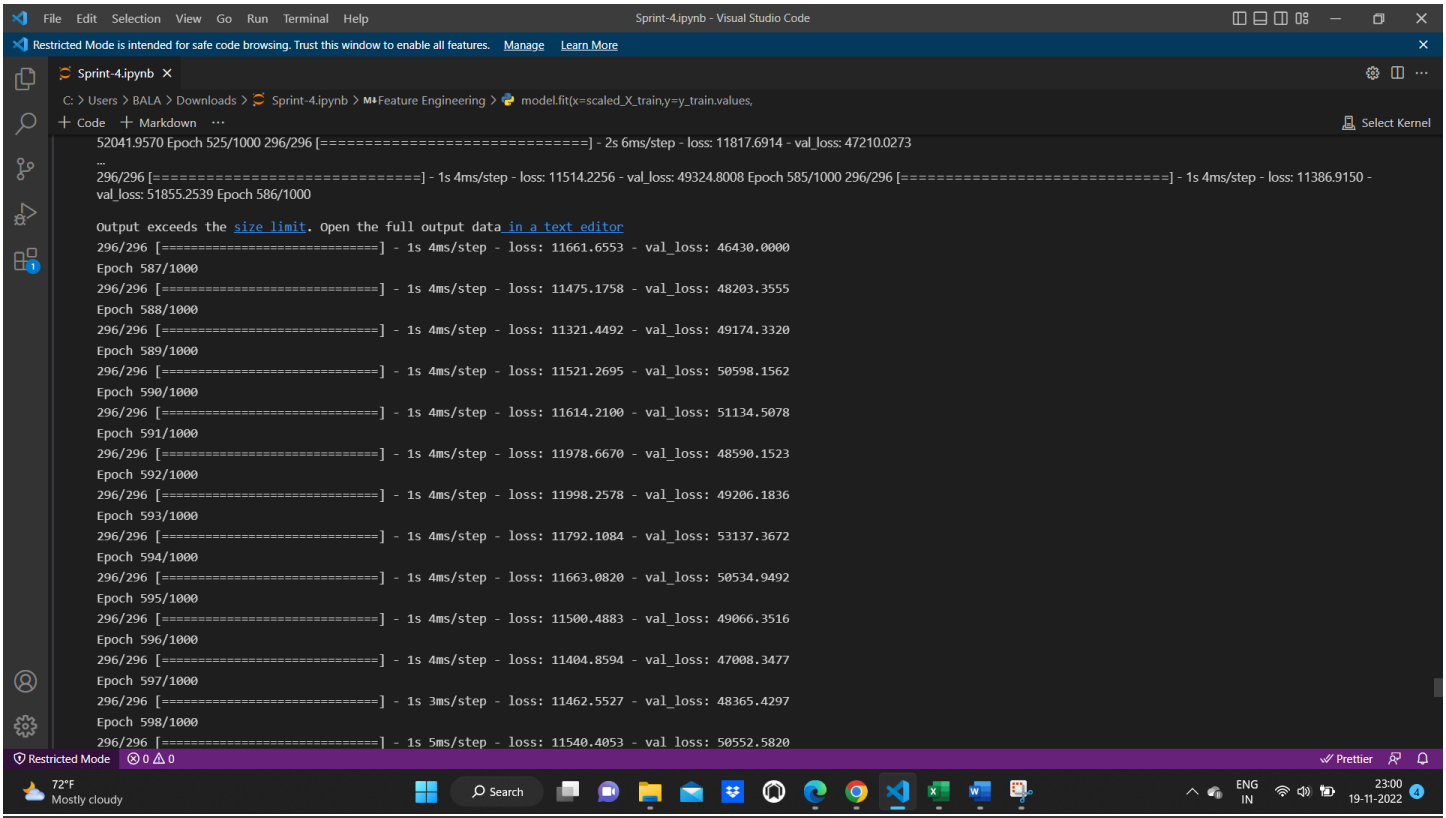
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Code Markdown
Select Kernel
52041.9570 Epoch 525/1000 296/296 [==========] - 2s 6ms/step - loss: 11817.6914 - val_loss: 47210.0273
...
296/296 [==========] - 1s 4ms/step - loss: 11514.2256 - val_loss: 49324.8008 Epoch 585/1000 296/296 [==========] - 1s 4ms/step - loss: 11386.9150 - val_loss: 51855.2539 Epoch 586/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 4ms/step - loss: 11661.6553 - val_loss: 46430.0000
Epoch 587/1000
296/296 [==========] - 1s 4ms/step - loss: 11475.1758 - val_loss: 48203.3555
Epoch 588/1000
296/296 [==========] - 1s 4ms/step - loss: 11321.4492 - val_loss: 49174.3320
Epoch 589/1000
296/296 [==========] - 1s 4ms/step - loss: 11521.2695 - val_loss: 50598.1562
Epoch 590/1000
296/296 [==========] - 1s 4ms/step - loss: 11614.2100 - val_loss: 51134.5078
Epoch 591/1000
296/296 [==========] - 1s 4ms/step - loss: 11978.6670 - val_loss: 48590.1523
Epoch 592/1000
296/296 [==========] - 1s 4ms/step - loss: 11998.2578 - val_loss: 49206.1836
Epoch 593/1000
296/296 [==========] - 1s 4ms/step - loss: 11792.1084 - val_loss: 53137.3672
Epoch 594/1000
296/296 [==========] - 1s 4ms/step - loss: 11663.0820 - val_loss: 50534.9492
Epoch 595/1000
296/296 [==========] - 1s 4ms/step - loss: 11500.4883 - val_loss: 49066.3516
Epoch 596/1000
296/296 [==========] - 1s 4ms/step - loss: 11404.8594 - val_loss: 47008.3477
Epoch 597/1000
296/296 [==========] - 1s 3ms/step - loss: 11462.5527 - val_loss: 48365.4297
Epoch 598/1000
296/296 [==========] - 1s 5ms/step - loss: 11540.4053 - val_loss: 50552.5820
Restricted Mode
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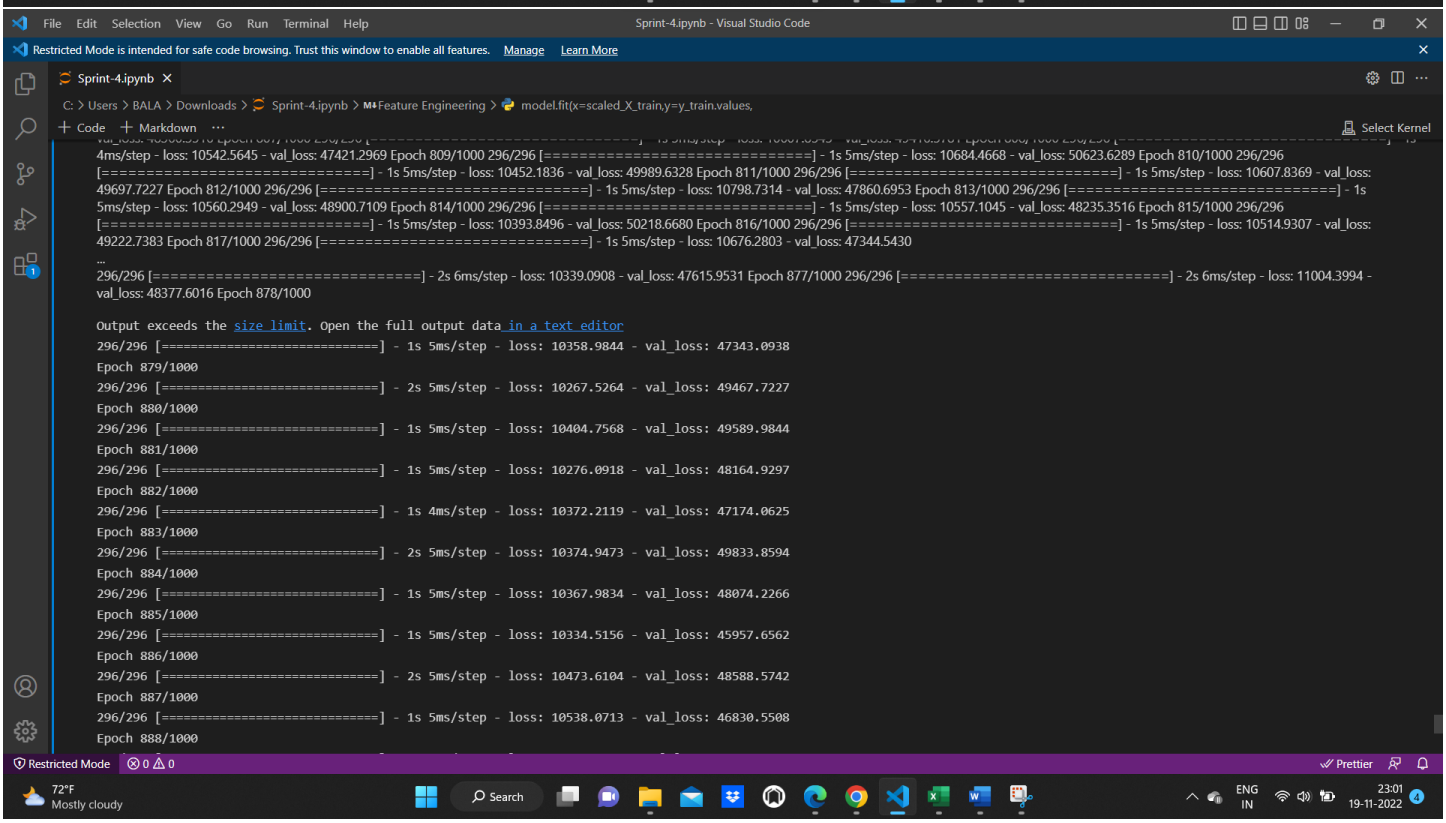
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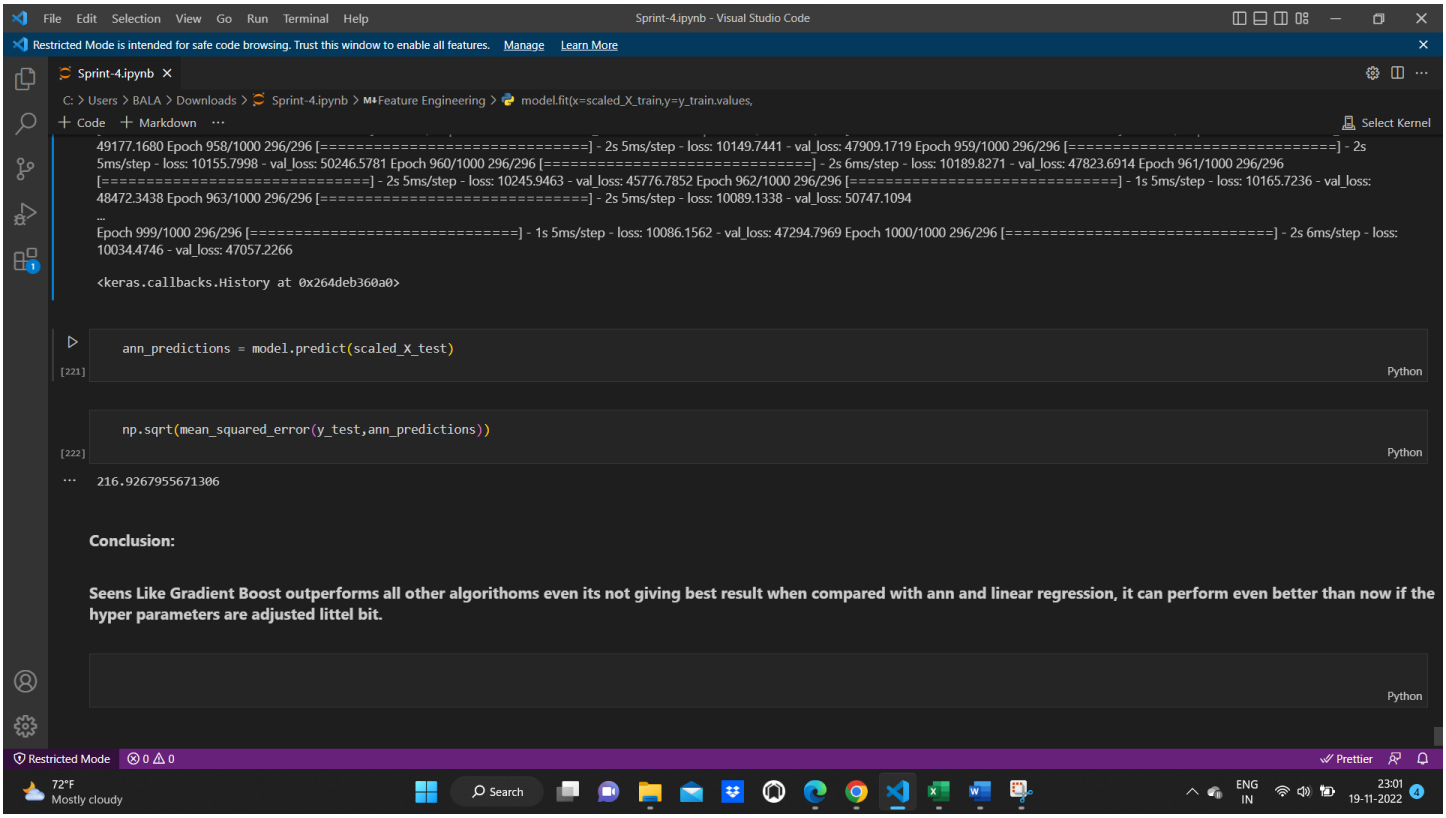
Code Markdown
Select Kernel
4ms/step - loss: 10542.5645 - val_loss: 47421.2969 Epoch 809/1000 296/296 [==========] - 1s 5ms/step - loss: 10684.4668 - val_loss: 50623.6289 Epoch 810/1000 296/296 [==========] - 1s 5ms/step - loss: 10452.1836 - val_loss: 49989.6328 Epoch 811/1000 296/296 [==========] - 1s 5ms/step - loss: 10607.8369 - val_loss: 49697.7227 Epoch 812/1000 296/296 [==========] - 1s 5ms/step - loss: 10798.7314 - val_loss: 47860.6953 Epoch 813/1000 296/296 [==========] - 1s 5ms/step - loss: 10560.2949 - val_loss: 48900.7109 Epoch 814/1000 296/296 [==========] - 1s 5ms/step - loss: 10557.1045 - val_loss: 48235.3516 Epoch 815/1000 296/296 [==========] - 1s 5ms/step - loss: 10393.8496 - val_loss: 50218.6680 Epoch 816/1000 296/296 [==========] - 1s 5ms/step - loss: 10514.9307 - val_loss: 49222.7383 Epoch 817/1000 296/296 [==========] - 1s 5ms/step - loss: 10676.2803 - val_loss: 47344.5430
...
296/296 [==========] - 2s 6ms/step - loss: 10339.0908 - val_loss: 47615.9531 Epoch 877/1000 296/296 [==========] - 2s 6ms/step - loss: 11004.3994 - val_loss: 48377.6016 Epoch 878/1000
Output exceeds the size limit. Open the full output data in a text editor
296/296 [==========] - 1s 5ms/step - loss: 10358.9844 - val_loss: 47343.0938
Epoch 879/1000
296/296 [==========] - 2s 5ms/step - loss: 10267.5264 - val_loss: 49467.7227
Epoch 880/1000
296/296 [==========] - 1s 5ms/step - loss: 10404.7568 - val_loss: 49589.9844
Epoch 881/1000
296/296 [==========] - 1s 5ms/step - loss: 10276.0918 - val_loss: 48164.9297
Epoch 882/1000
296/296 [==========] - 1s 4ms/step - loss: 10372.2119 - val_loss: 47174.0625
Epoch 883/1000
296/296 [==========] - 2s 5ms/step - loss: 10374.9473 - val_loss: 49833.8594
Epoch 884/1000
296/296 [==========] - 1s 5ms/step - loss: 10367.9834 - val_loss: 48074.2266
Epoch 885/1000
296/296 [==========] - 1s 5ms/step - loss: 10334.5156 - val_loss: 45957.6562
Epoch 886/1000
296/296 [==========] - 2s 5ms/step - loss: 10473.6104 - val_loss: 48588.5742
Epoch 887/1000
296/296 [==========] - 1s 5ms/step - loss: 10538.0713 - val_loss: 46830.5508
Epoch 888/1000
Restricted Mode
Prettier
72°F Mostly cloudy
Search
ENG IN
23:01 19-11-2022



9.ADVANTAGES

- Cost efficiency
- Receive full-scale services
- Maximize presentation
- Save time

10. DISADVANTAGES

- Risk of choosing the wrong provider
- Lack of on-site support
- Less control
- Data security

11.Conclusion:

Historically, sales success has relied on intuition and Subjectivity. Sales reps conduct in-depth research on prospects and then chase the most suitable fits. This process relies on trial and error to figure out prospects' expectations and apply the rep's intuitions to understand prospects' pain points. Reps use sales data analysis to make critical decisions. Adopting a data-driven sales approach takes subjectivity out of the equation and makes the whole process of selling more predictable and efficient. sales data and proper sales data analysis tools can speed up your growth rapidly.