Sprint-2 **Team ID: PNT2022TMID21513**

Functional Requirement (Epic): Registration

User Story Number: USN-3

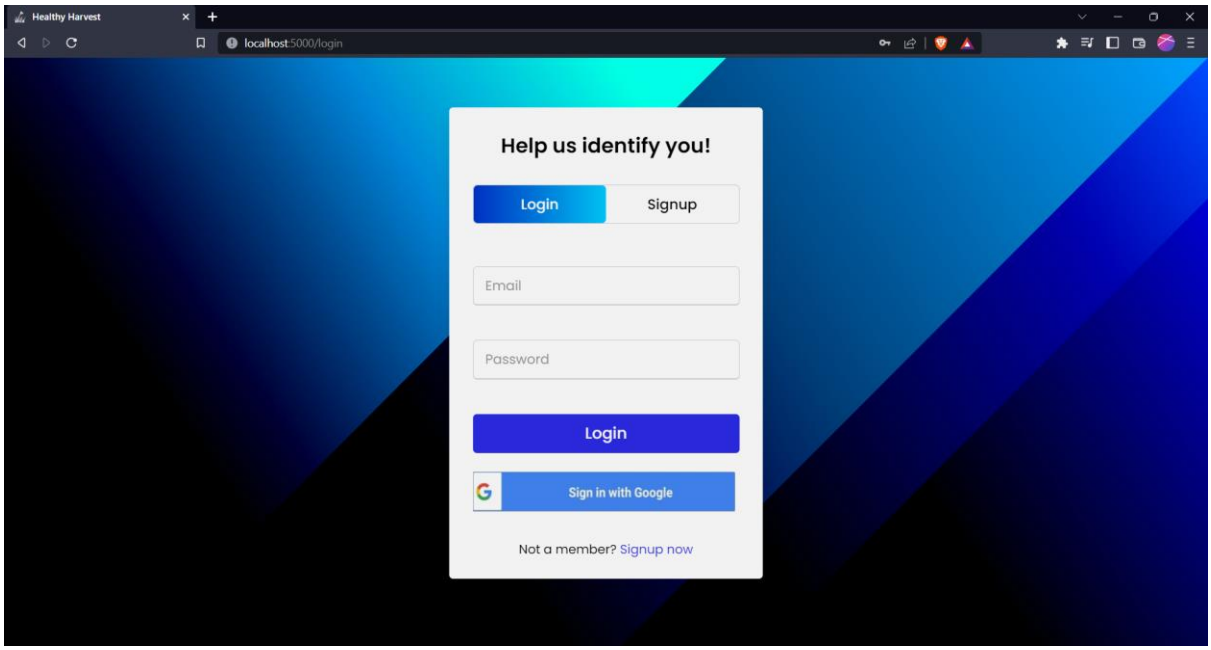
User Story / Task Story: As a user, I can login for the application through Google Sign-on.

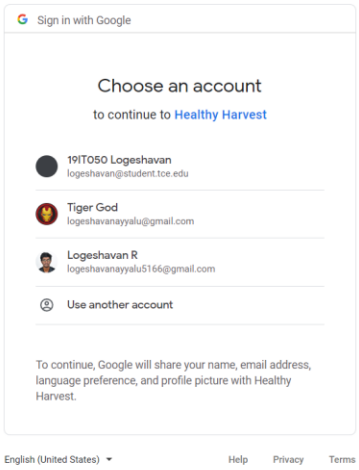
Points: 2

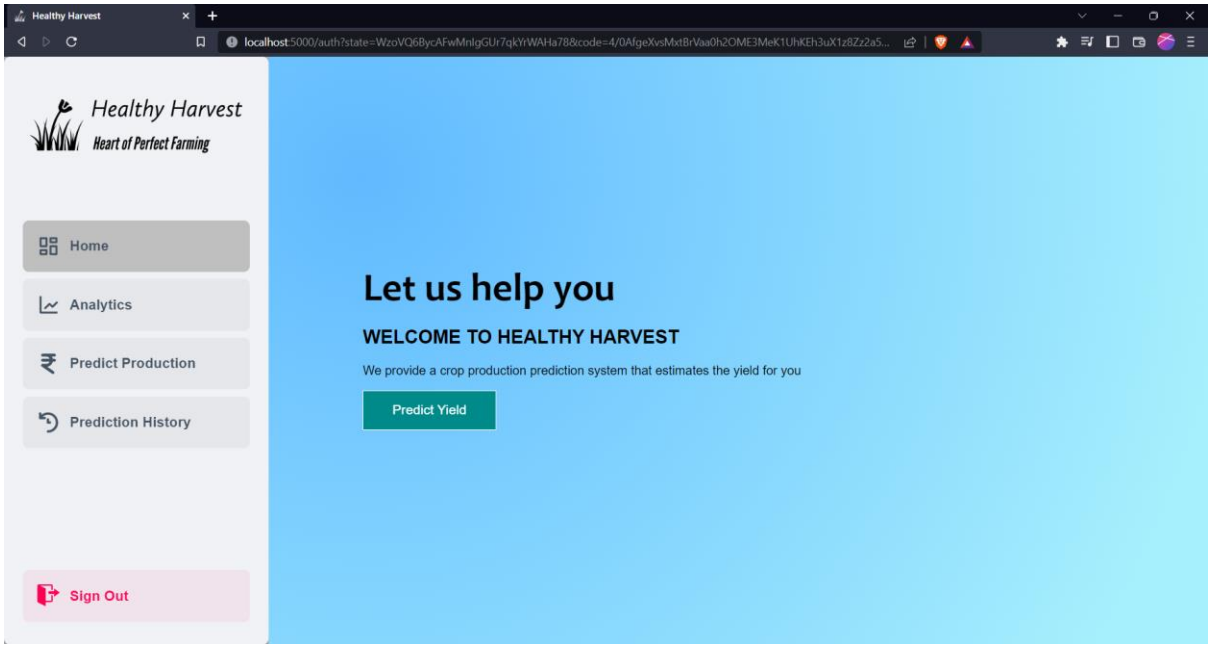
Priority: Low

Team Members: Roshika B

Screenshots:







Functional Requirement (Epic): Prediction

User Story Number: USN-8

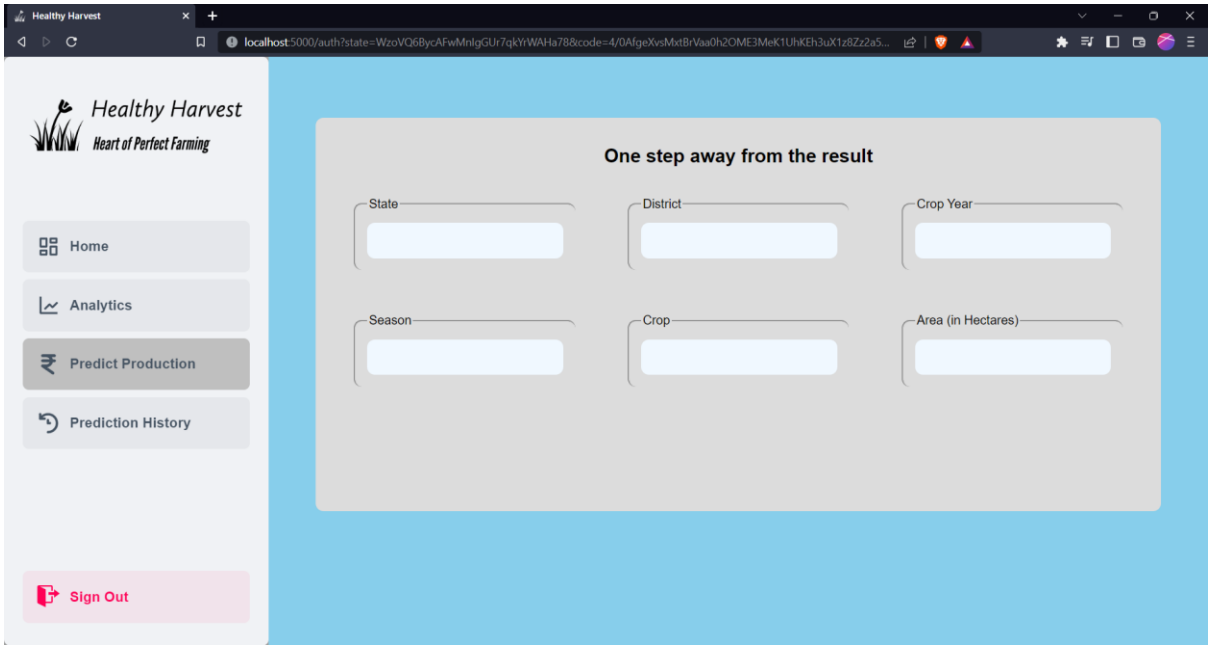
User Story / Task Story: As a user, with the results obtained, I can determine whether profit or loss is made.

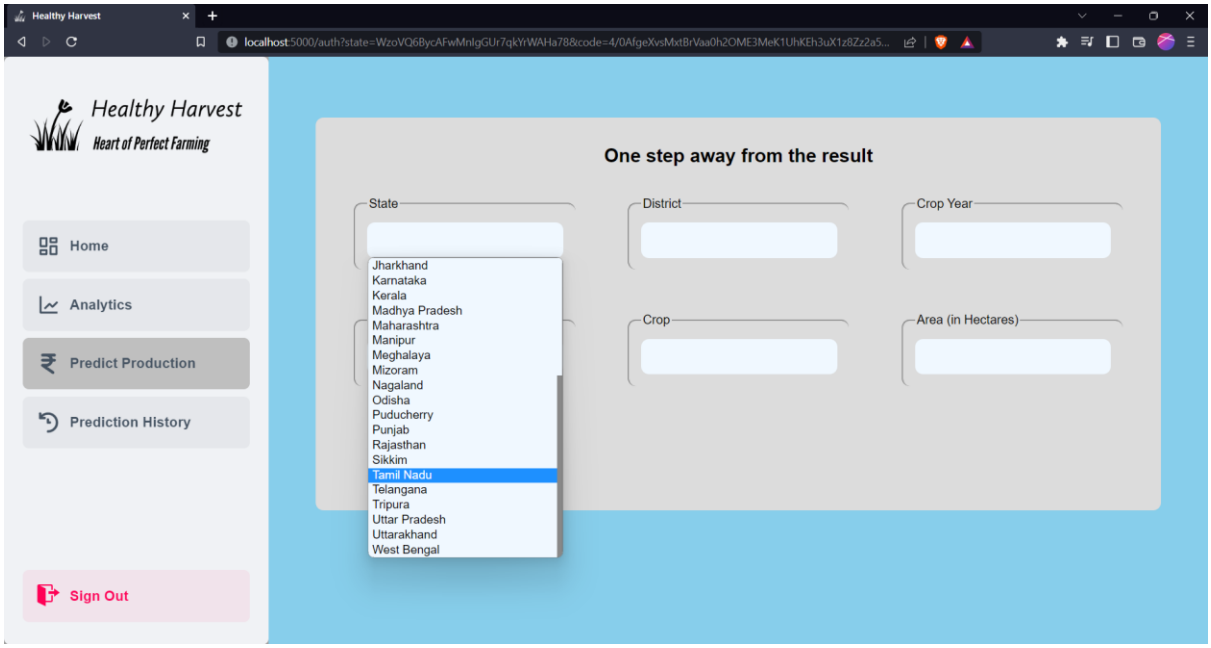
Points: 2

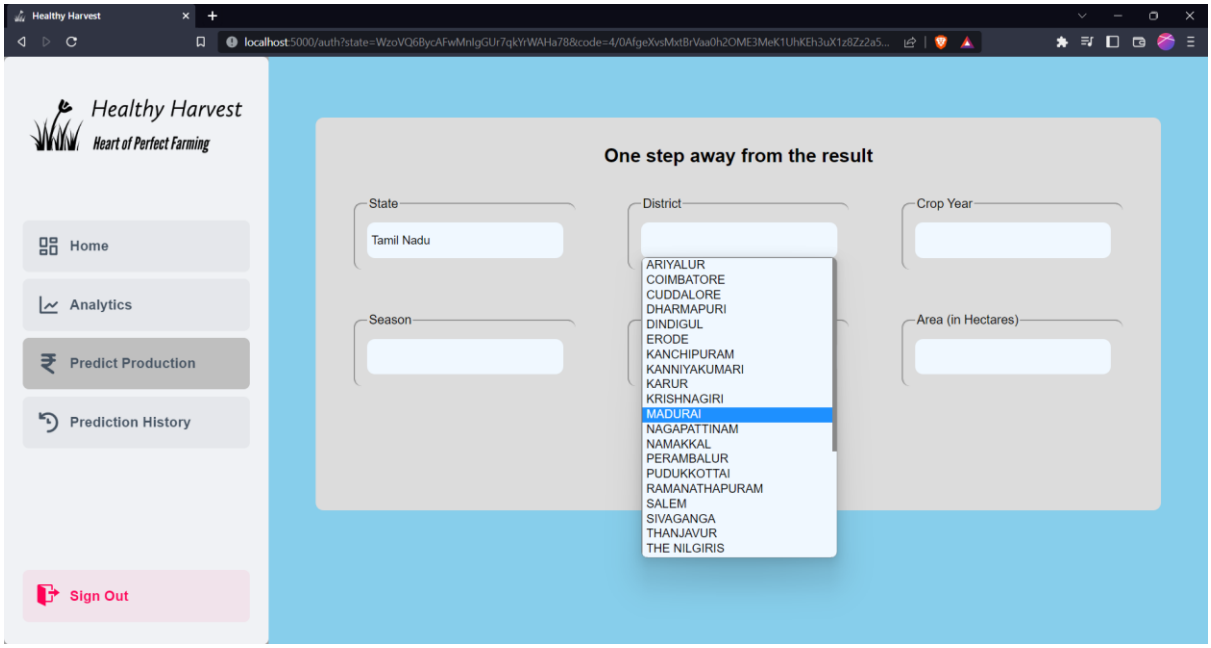
Priority: High

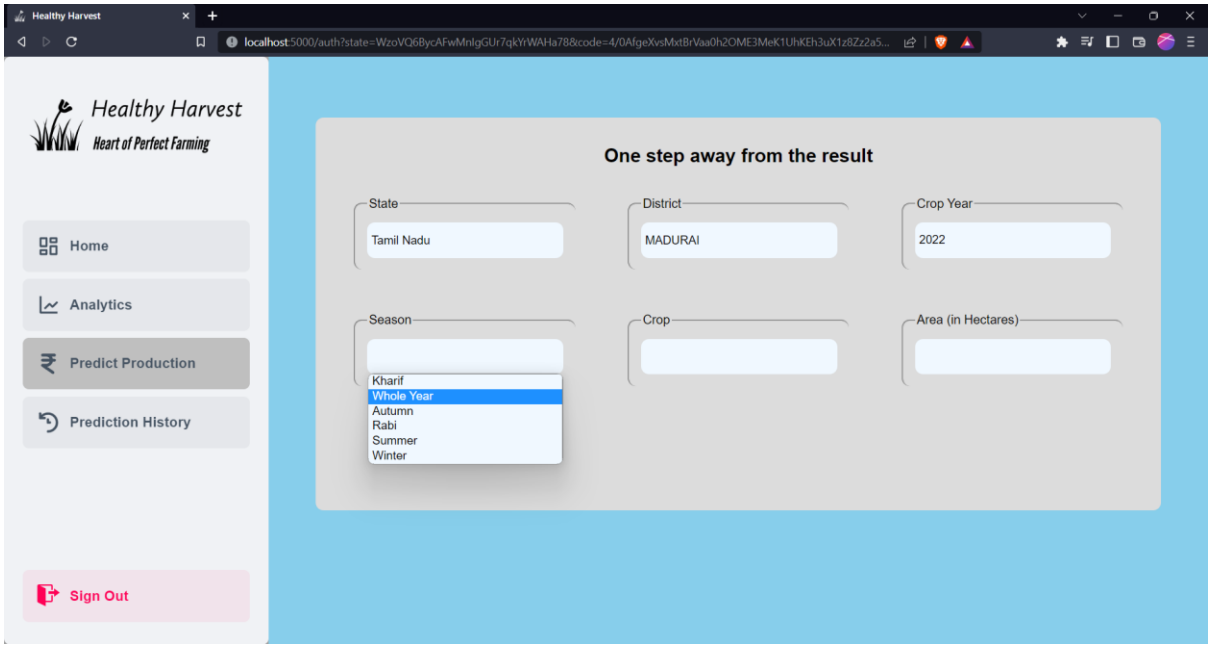
Team Members: Logeshavan R

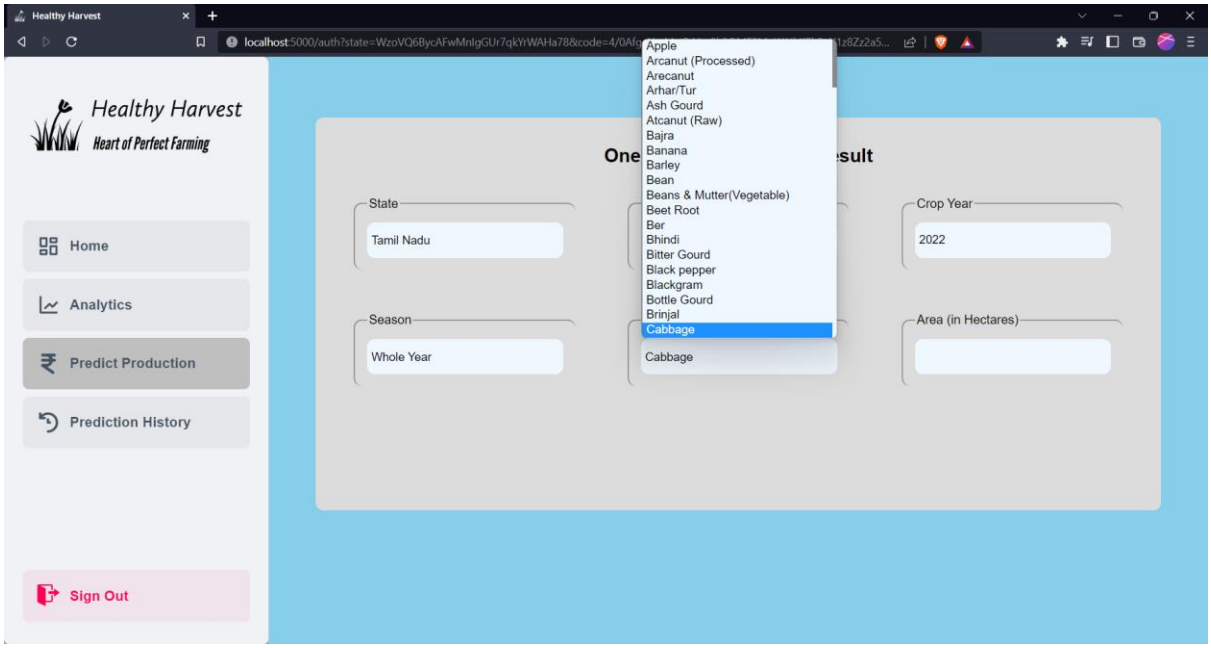
Screenshots:

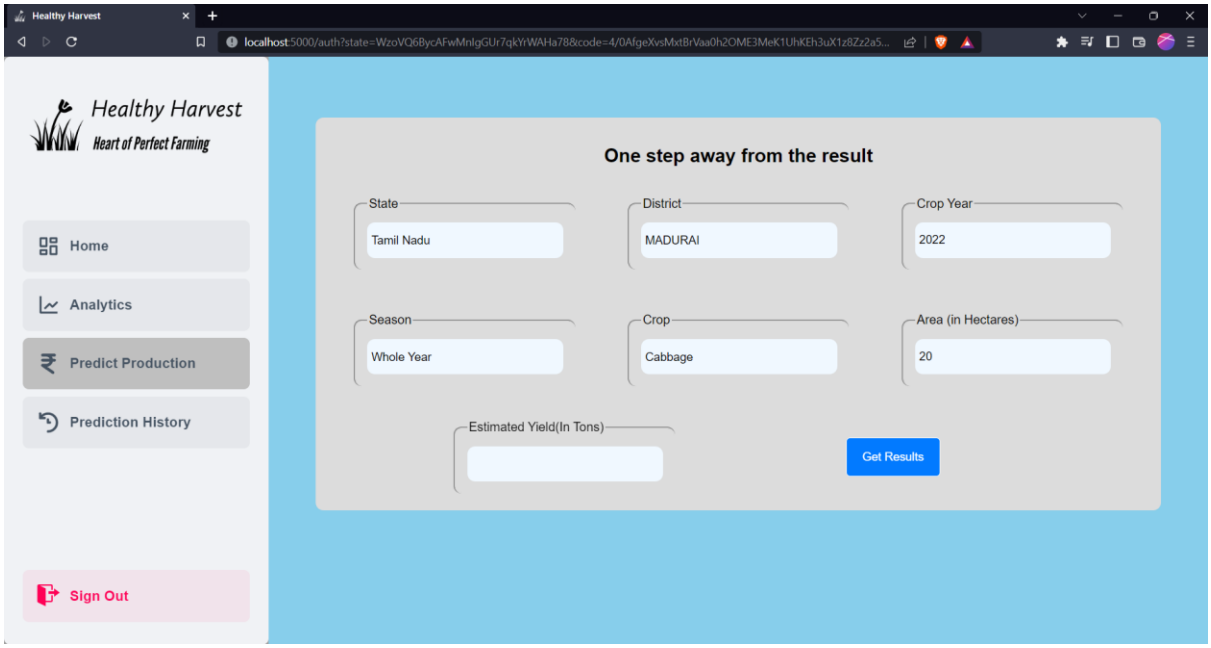


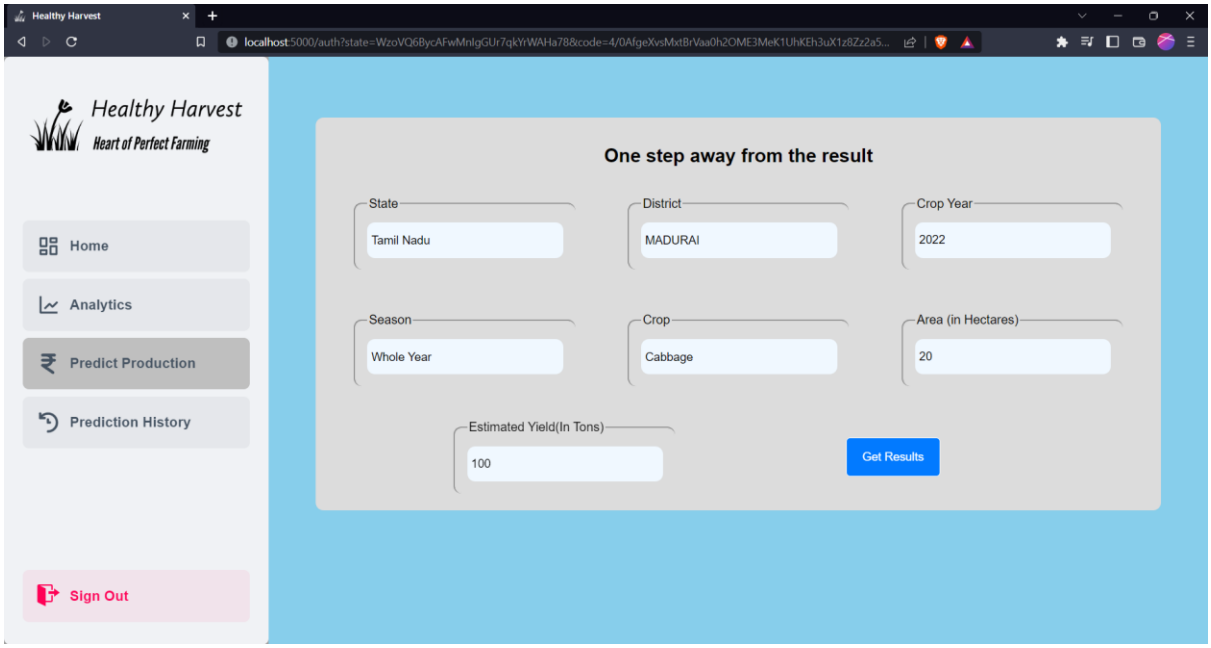

Healthy Harvest
localhost:5000/auth?state=WzoVQ6BycAFwMnIgGUr7qkYrWAHa78&code=4/0AfgeXvsMxtBrVaa0h2OME3MeK1UhKEh3uX1z8Zz2a5...
Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
District
Crop Year
Crop
Area (in Hectares)
Jharkhand
Karnataka
Kerala
Madhya Pradesh
Maharashtra
Manipur
Meghalaya
Mizoram
Nagaland
Odisha
Puducherry
Punjab
Rajasthan
Sikkim
Tamil Nadu
Telangana
Tripura
Uttar Pradesh
Uttarakhand
West Bengal

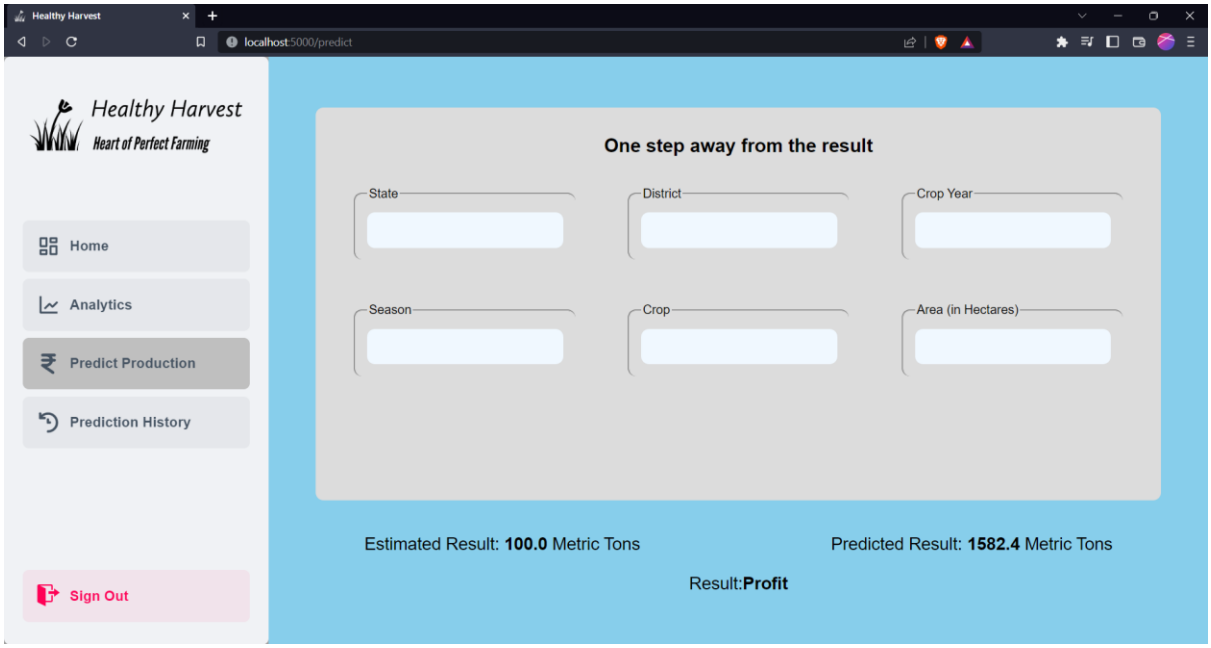

Healthy Harvest
localhost:5000/auth?state=WzoVQ6BycAFwMnIgGUr7qkYrWAHa78&code=4/0AfgeXvsMxtBrVaa0h2OME3MeK1UhKEh3uX1z8Zz2a5...
Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
Tamil Nadu
District
Crop Year
Season
Area (in Hectares)
ARIYALUR
COIMBATORE
CUDDALORE
DHARMAPURI
DINDIGUL
ERODE
KANCHIPURAM
KANNIYAKUMARI
KARUR
KRISHNAGIRI
MADURAI
NAGAPATTINAM
NAMAKKAL
PERAMBALUR
PUDUKKOTTAI
RAMANATHAPURAM
SALEM
SIVAGANGA
THANJAVUR
THE NILGIRIS


Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
Tamil Nadu
District
MADURAI
Crop Year
2022
Season
Crop
Area (in Hectares)
Kharif
Whole Year
Autumn
Rabi
Summer
Winter


Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
State
Tamil Nadu
Crop Year
2022
Season
Whole Year
Cabbage
Area (in Hectares)
Apple
Arcanut (Processed)
Arecanut
Arhar/Tur
Ash Gourd
Atcanut (Raw)
Bajra
Banana
Barley
Bean
Beans & Mutter(Vegetable)
Beet Root
Ber
Bhindi
Bitter Gourd
Black pepper
Blackgram
Bottle Gourd
Brinjal
Cabbage


Healthy Harvest
localhost:5000/auth?state=WzoVQ6BycAFwMnIgGUr7qkYrWAHa78&code=4/0AfgeXvsMxtBrVaa0h2OME3MeK1UhKEh3uX1z8Zz2a5...
Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
Tamil Nadu
District
MADURAI
Crop Year
2022
Season
Whole Year
Crop
Cabbage
Area (in Hectares)
20
Estimated Yield(In Tons)
Get Results


Healthy Harvest
localhost:5000/auth?state=WzoVQ6BycAFwMnIgGUr7qkYrWAHa78&code=4/0AfgeXvsMxtBrVaa0h2OME3MeK1UhKEh3uX1z8Zz2a5...
Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
Tamil Nadu
District
MADURAI
Crop Year
2022
Season
Whole Year
Crop
Cabbage
Area (in Hectares)
20
Estimated Yield(In Tons)
100
Get Results



Functional Requirement (Epic): Tools

User Story Number: USN-11

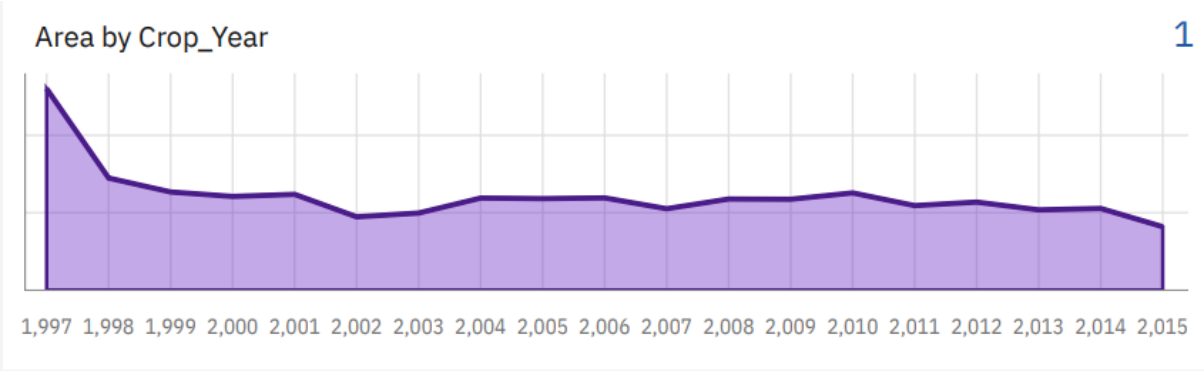
User Story / Task Story: As a user, I use cognos analytics to perform data analysis on the collected dataset

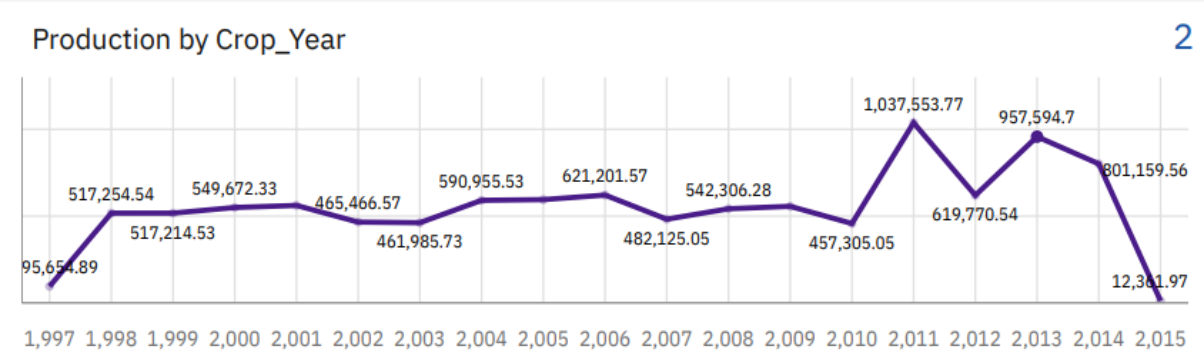
Points: 1

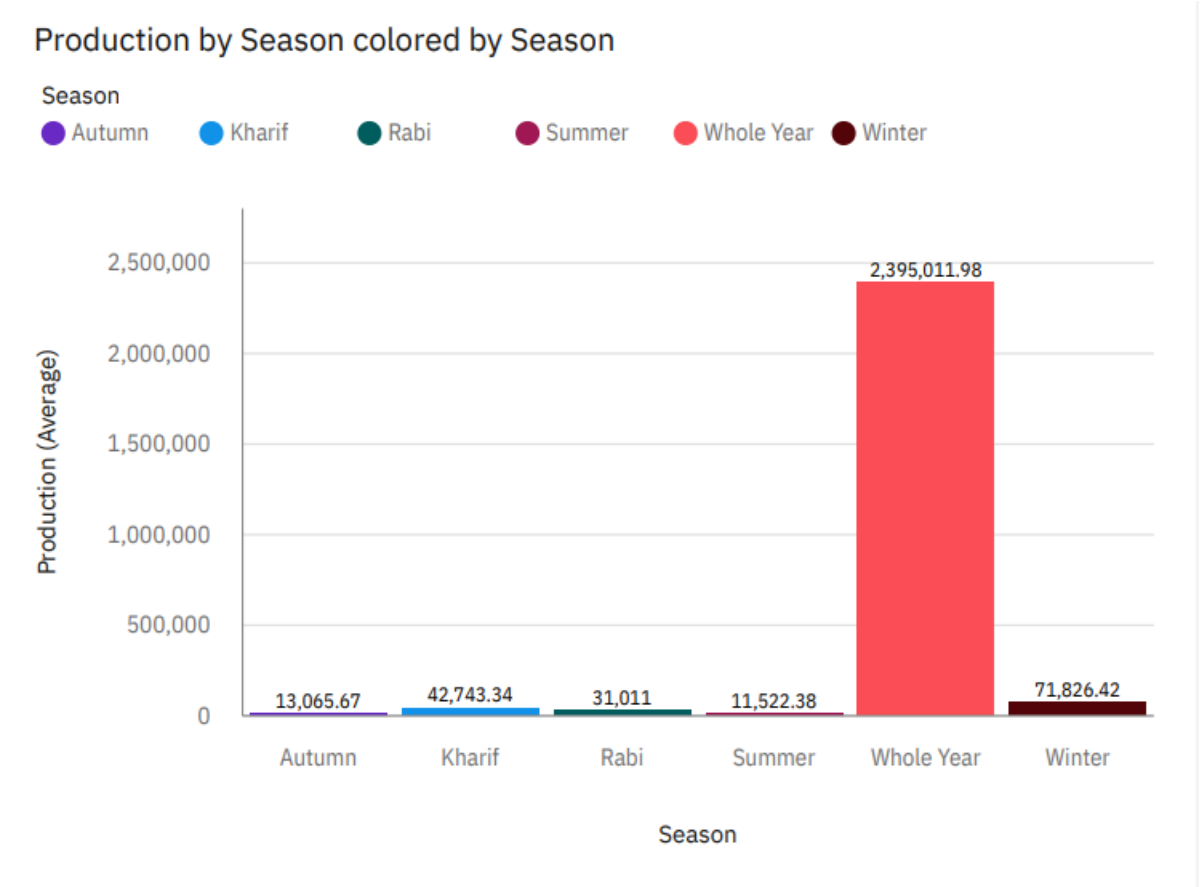
Priority: High

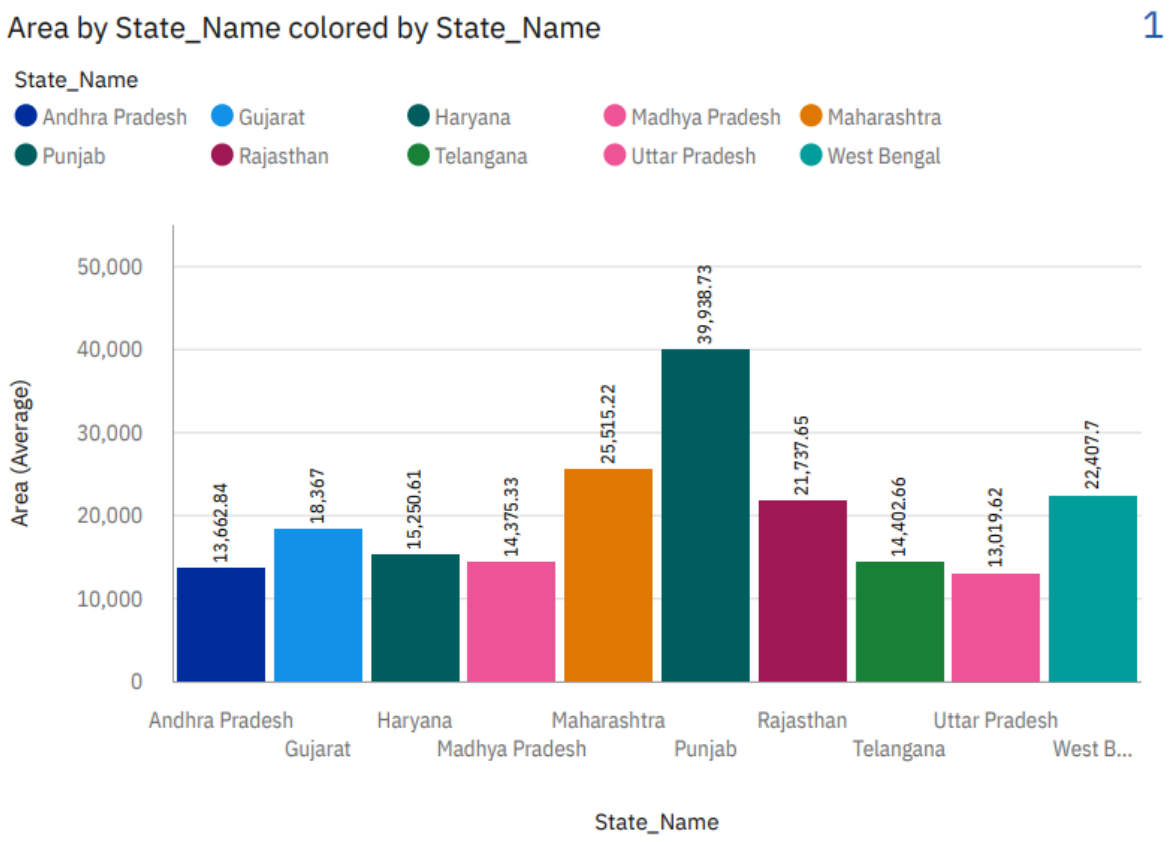
Team Members: Logeshavan R

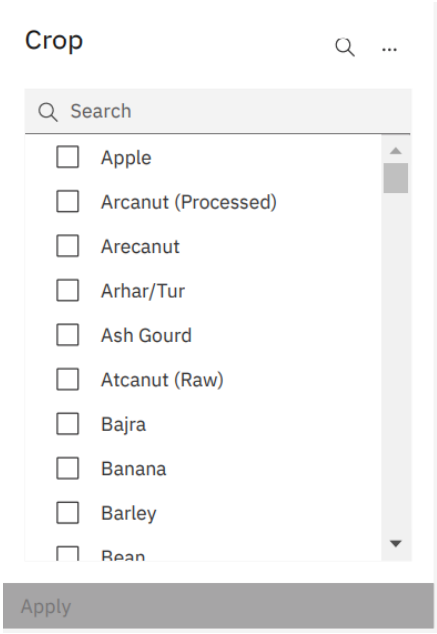
Screenshots:

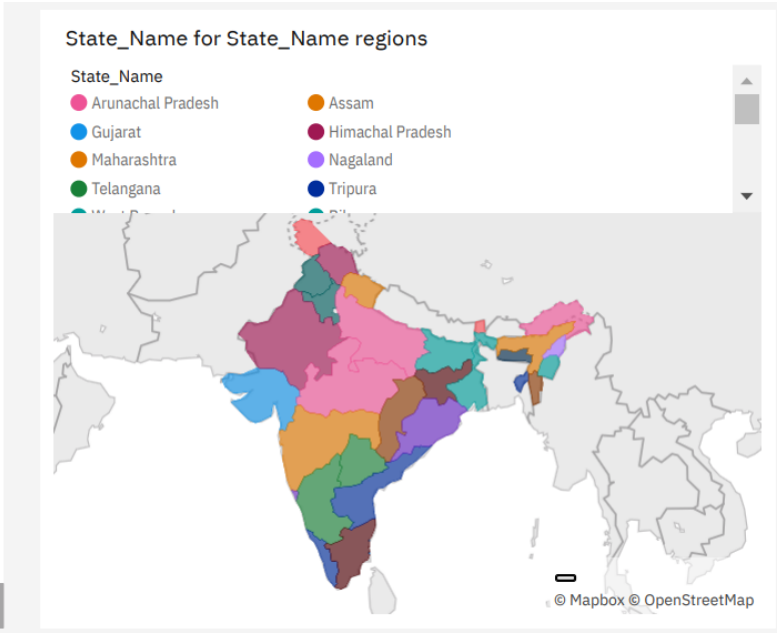


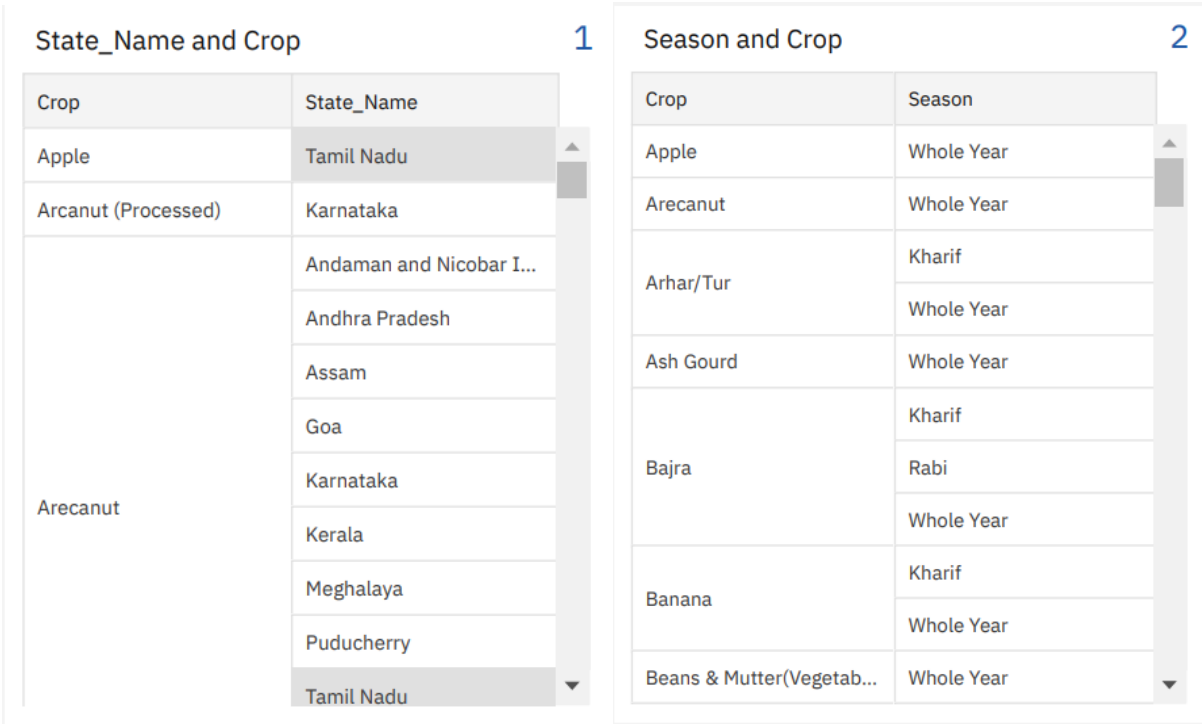

Production by Crop_Year
2
95,654.89
517,254.54
517,214.53
549,672.33
465,466.57
461,985.73
590,955.53
621,201.57
482,125.05
542,306.28
457,305.05
1,037,553.77
619,770.54
957,594.7
801,159.56
12,361.97
1,997 1,998 1,999 2,000 2,001 2,002 2,003 2,004 2,005 2,006 2,007 2,008 2,009 2,010 2,011 2,012 2,013 2,014 2,015


Production by Season colored by Season
Season
Autumn
Kharif
Rabi
Summer
Whole Year
Winter
Production (Average)
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
13,065.67
42,743.34
31,011
11,522.38
2,395,011.98
71,826.42
Autumn
Kharif
Rabi
Summer
Whole Year
Winter
Season

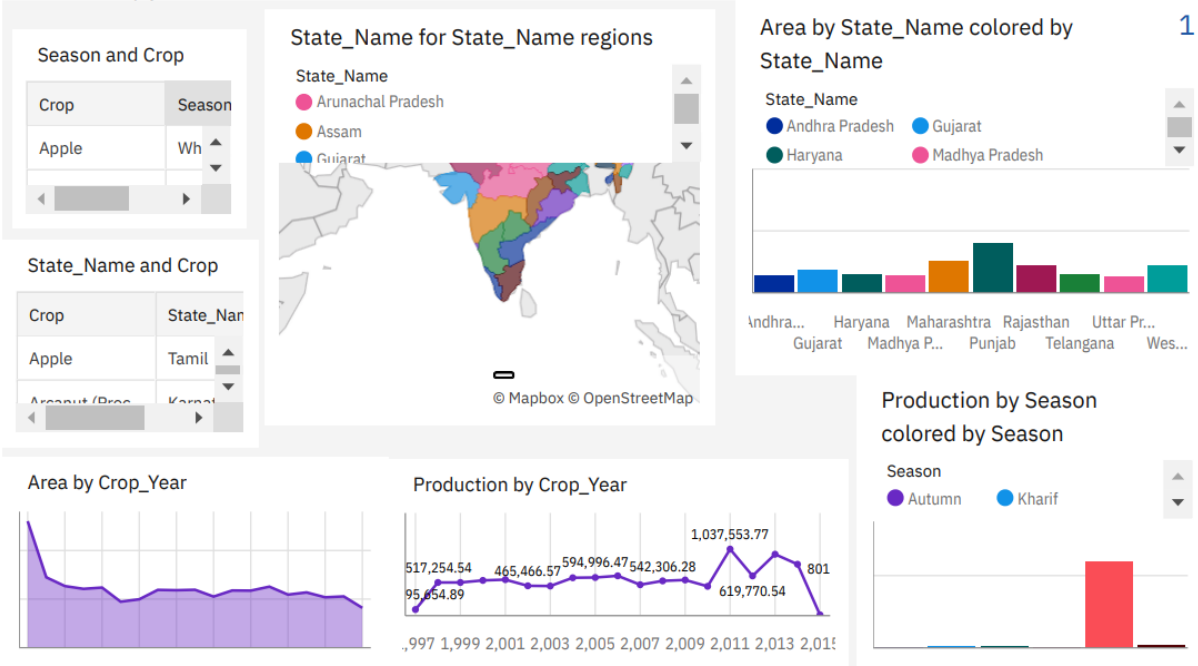

Area by State_Name colored by State_Name
1
State_Name
Andhra Pradesh
Gujarat
Haryana
Madhya Pradesh
Maharashtra
Punjab
Rajasthan
Telangana
Uttar Pradesh
West Bengal
Area (Average)
50,000
40,000
30,000
20,000
10,000
0
13,662.84
18,367
15,250.61
14,375.33
25,515.22
39,938.73
21,737.65
14,402.66
13,019.62
22,407.7
Andhra Pradesh
Gujarat
Haryana
Madhya Pradesh
Maharashtra
Punjab
Rajasthan
Telangana
Uttar Pradesh
West B...
State_Name


Crop
Search
Apple
Arcanut (Processed)
Arecanut
Arhar/Tur
Ash Gourd
Atcanut (Raw)
Bajra
Banana
Barley
Bean
Apply


State_Name for State_Name regions
State_Name
Arunachal Pradesh
Assam
Gujarat
Himachal Pradesh
Maharashtra
Nagaland
Telangana
Tripura
© Mapbox © OpenStreetMap



Dashboard-crop yield



Prediction:

Dataset Name: crop_production.csv

Data Pre-processing:

1) Removed null values
2) Removed Dependent Variables (State_Name was dependent on District_Name)
3) Used one-hot-encoding to convert strings to integer valued features.

Training and Testing split:

1) Training Dataset – 75%
2) Testing Dataset – 25%

Algorithms Used:

1) Linear Regression:
    - Mean Squared Error: 2127160913705615.5
    - R-Square Value: -6.395488603751196

2) Random Forest Regressor
    - Mean Squared Error: 7205205429626.706
    - R2 score: 0.9752199327433567

3) XGB Regressor
    - Mean Squared Error: 7320101742812.083
    - R2 score: 0.9745502426880536

4) Decision Tree Regressor
    - Mean Squared Error: 12144324403888.889
    - R2 score: 0.9577778943988027

Conclusion:

The algorithm which has lowest mean squared error and highest R-square value is chosen for prediction. Therefore, Random Forest Regressor algorithm is chosen for prediction.

The model is trained and stored in pickle file so that it can be used by the web application. The library used for storing the model in the pickle file is Joblib.