FunctionalRequirement(Epic): Registration

UserStoryNumber:USN-3

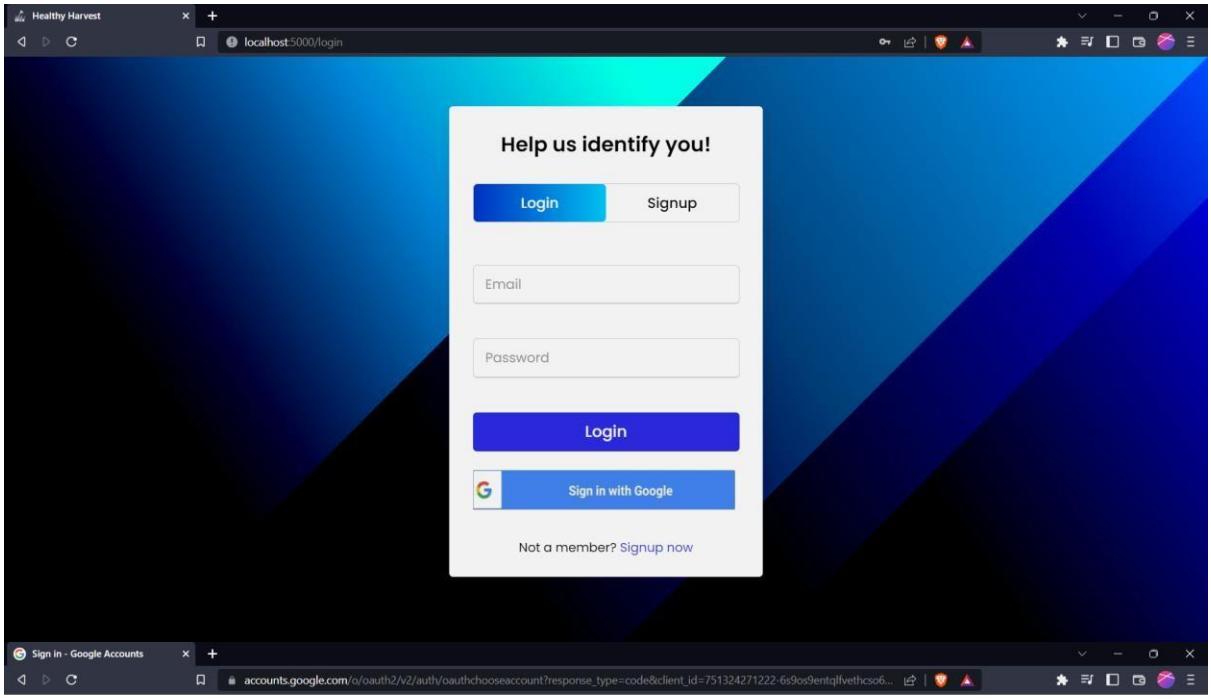
User Story / Task Story: As a user, I can login for the application through Google Sign-on.

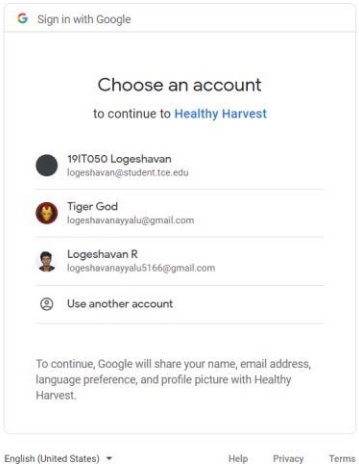
Points:2

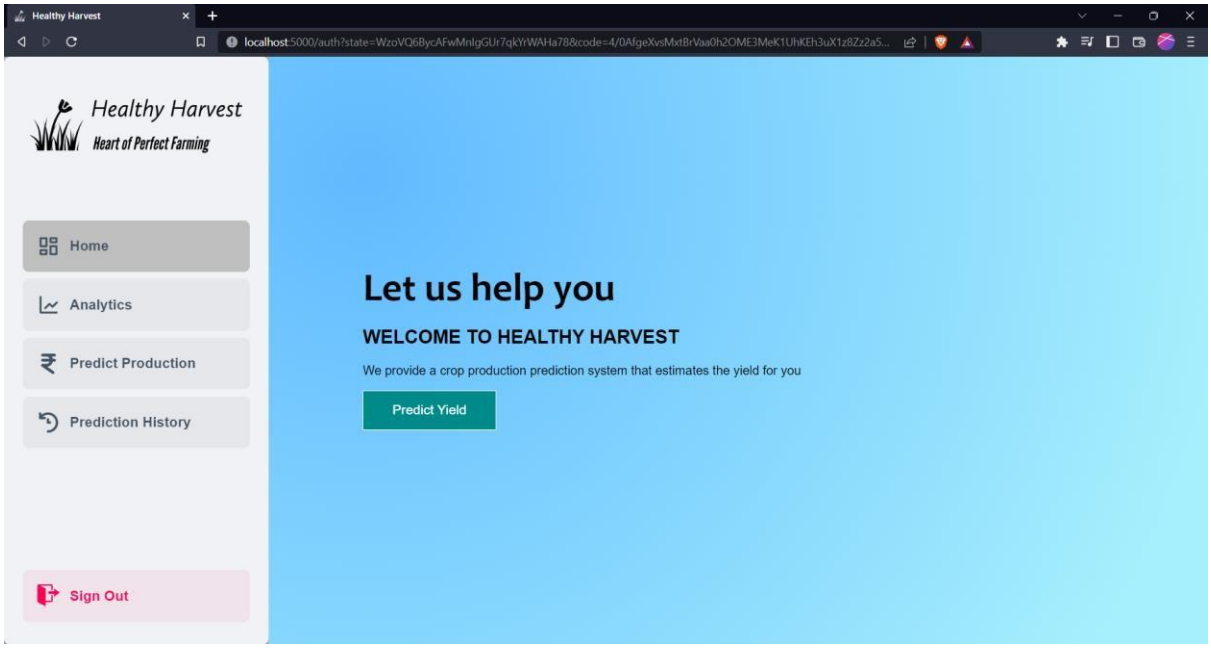
Priority: Low

TeamMembers:Kaviya N

Screenshots:







FunctionalRequirement(Epic): Prediction

UserStoryNumber:USN-8

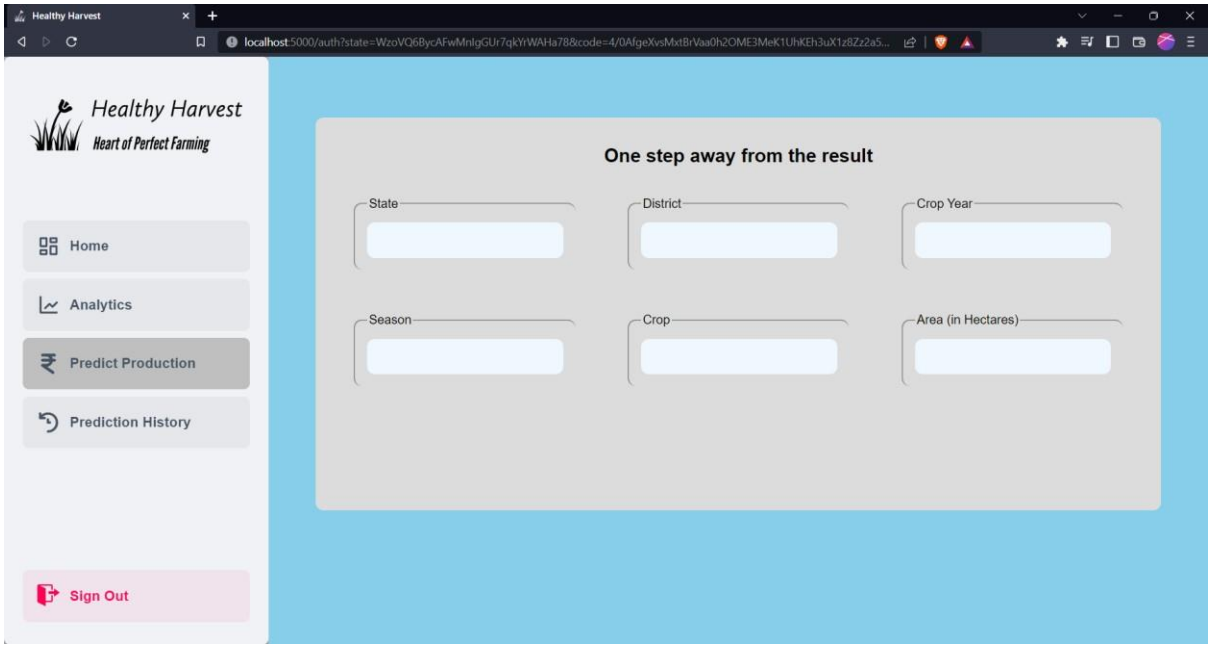
User Story / Task Story: As a user, with the results obtained, I can determine whetherprofitorlossis made.

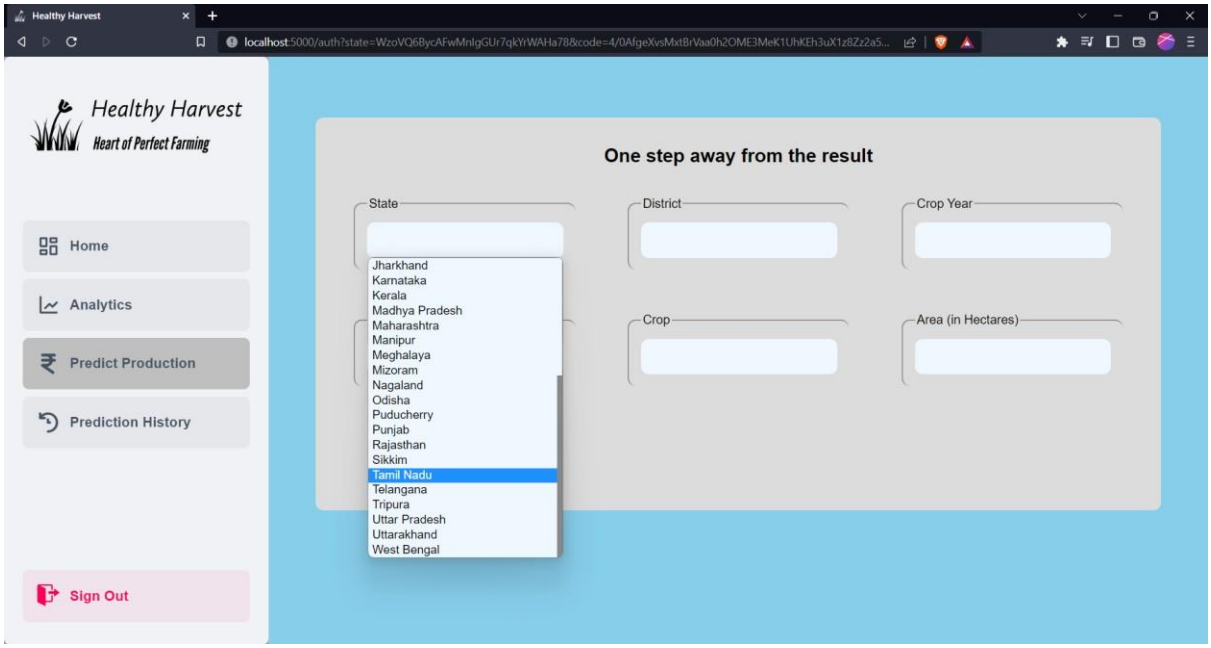
Points:2

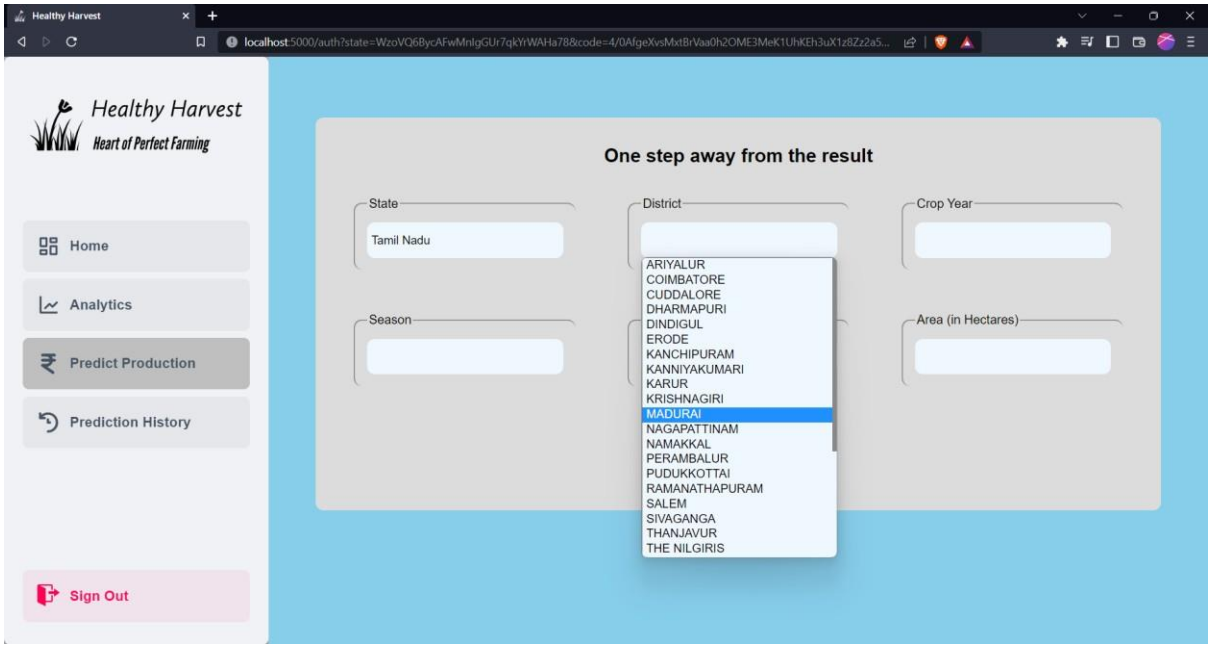
Priority: High

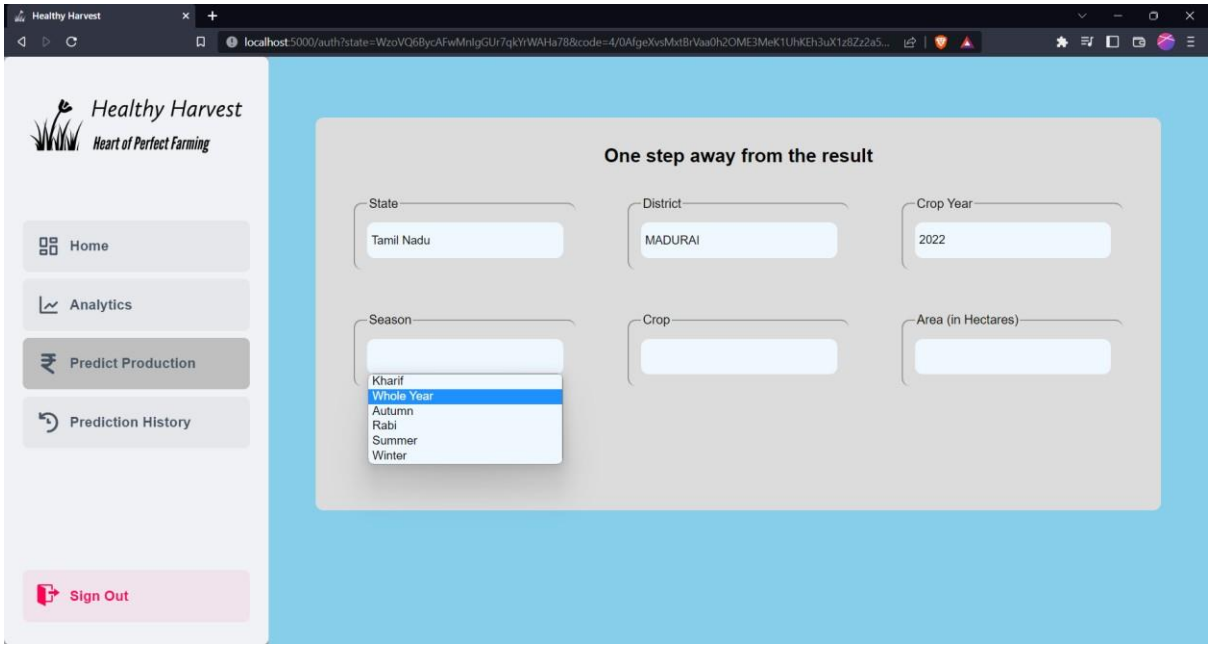
TeamMembers:Ranjani R

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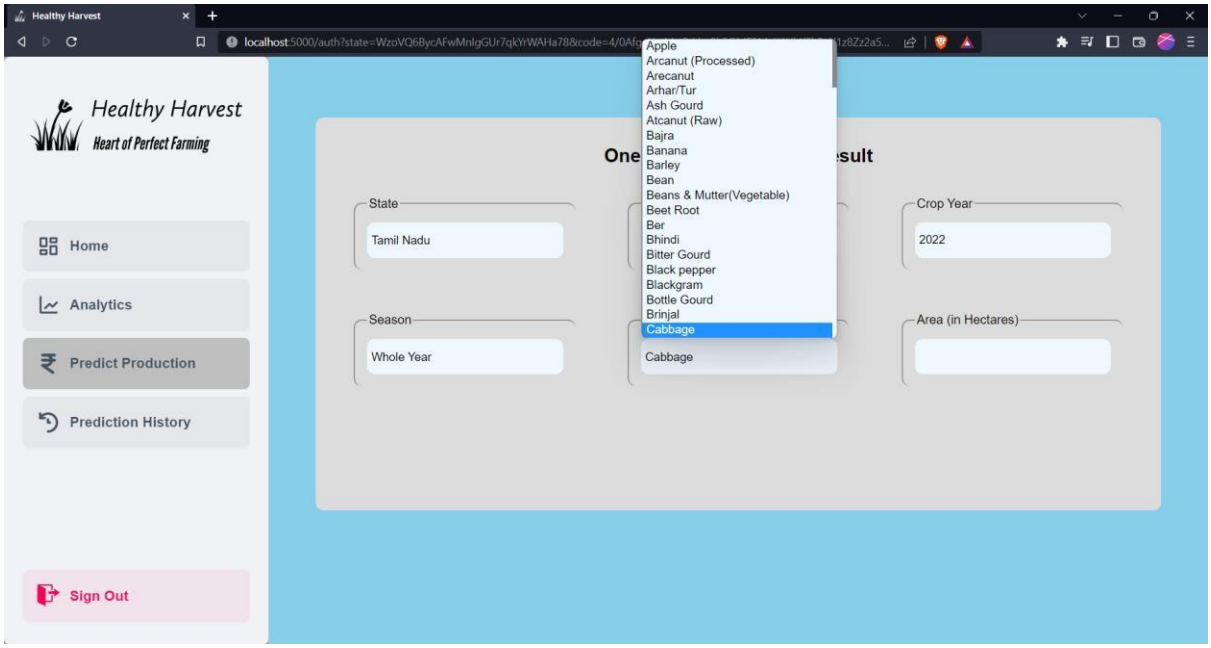
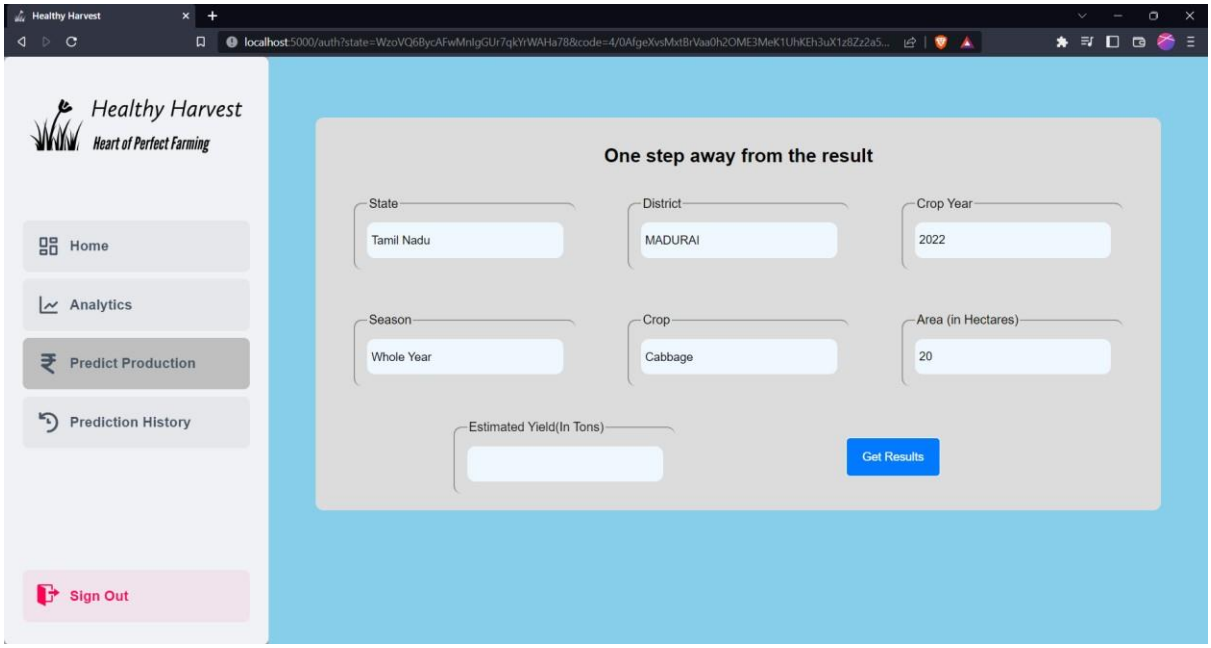
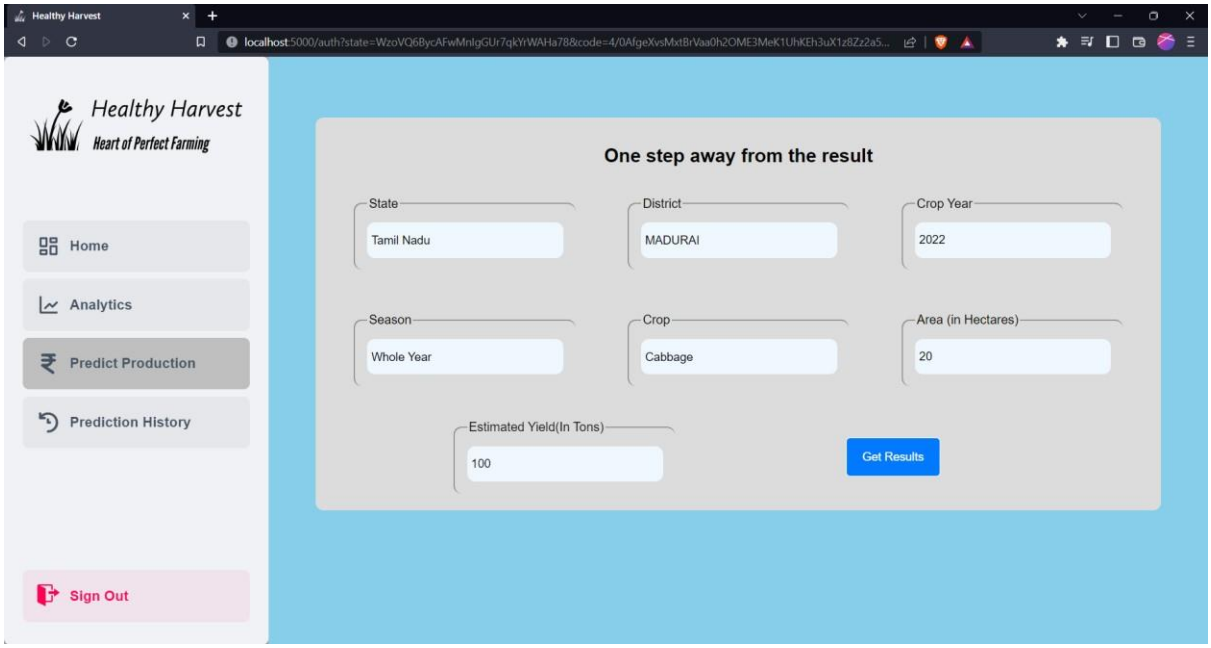
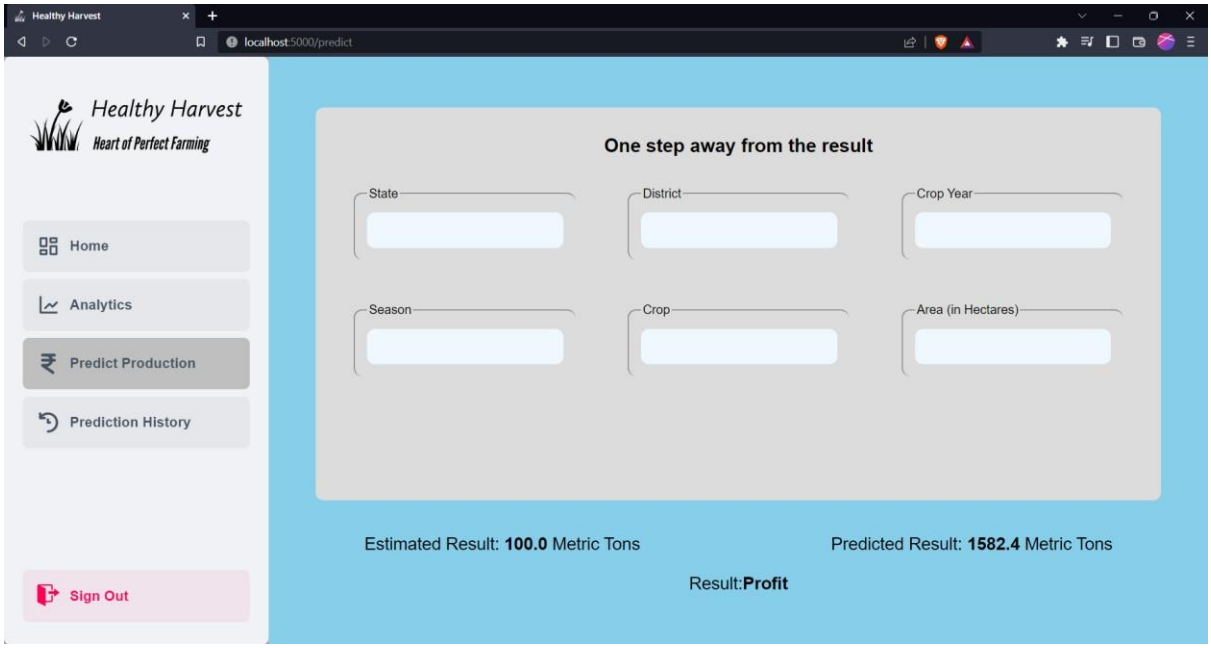
Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
One step away from the result
State
Tamil Nadu
District
MADURAI
Crop Year
2022
Season
Crop
Area (in Hectares)
Kharif
Whole Year
Autumn
Rabi
Summer
Winter


Healthy Harvest
Heart of Perfect Farming
Home
Analytics
Predict Production
Prediction History
Sign Out
State
Tamil Nadu
Crop Year
2022
Season
Whole Year
Area (in Hectares)
Cabbage
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



FunctionalRequirement(Epic): Tools

UserStoryNumber:USN-11

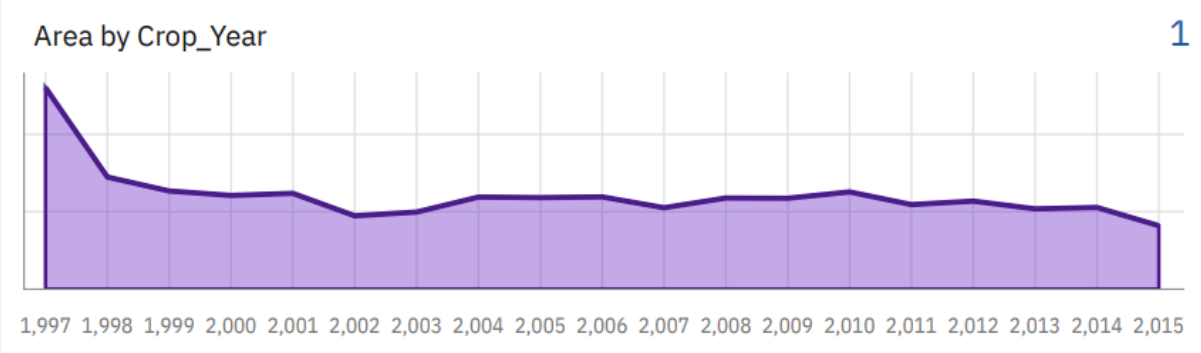
User Story / Task Story: As a user, I use cognos analytics to perform data analysis onthecollected dataset

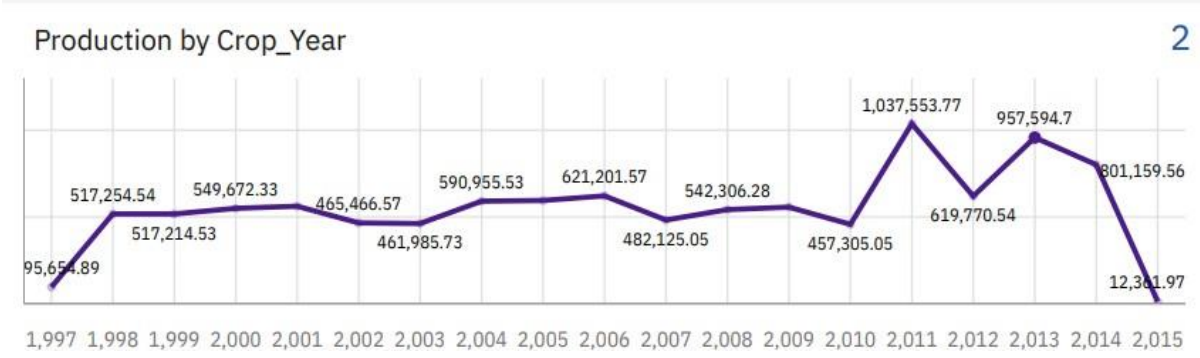
Points:1

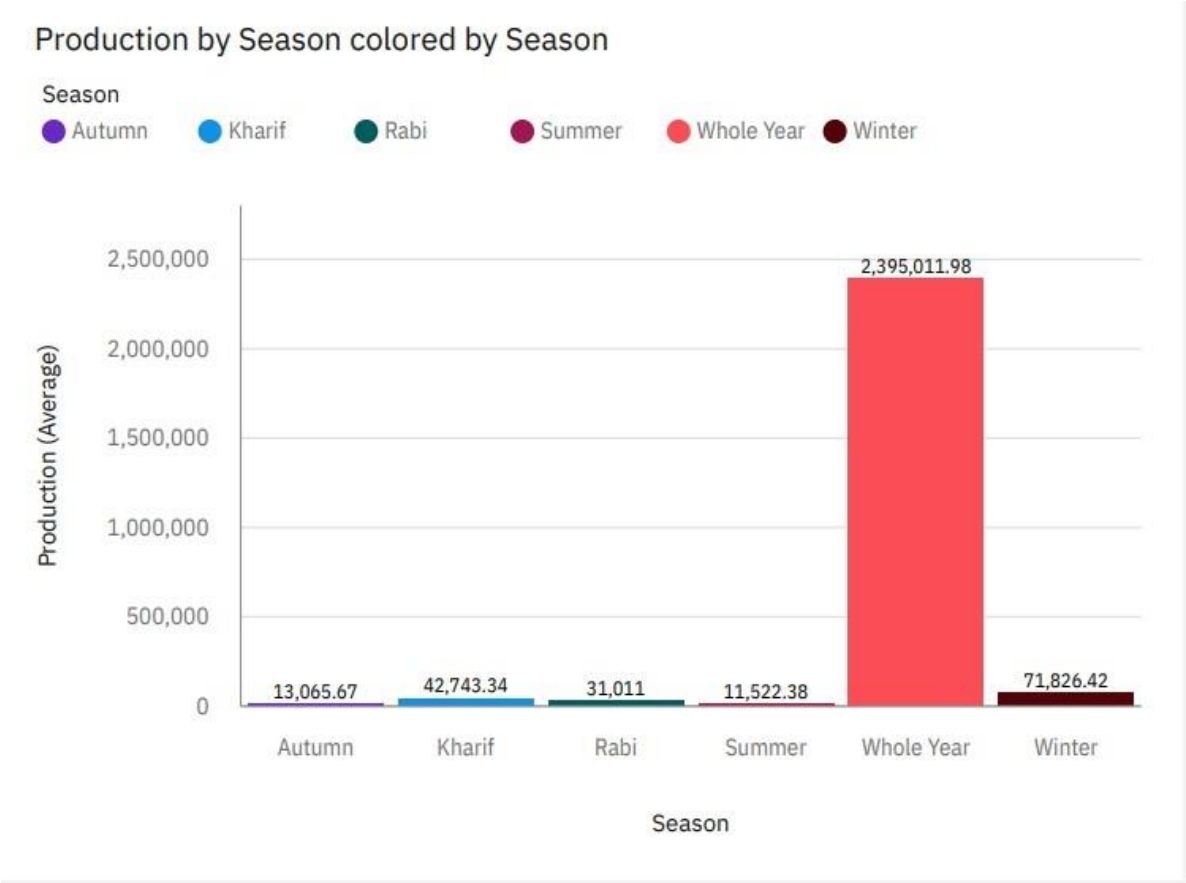
Priority: High

TeamMembers:Thamaraiselvi V

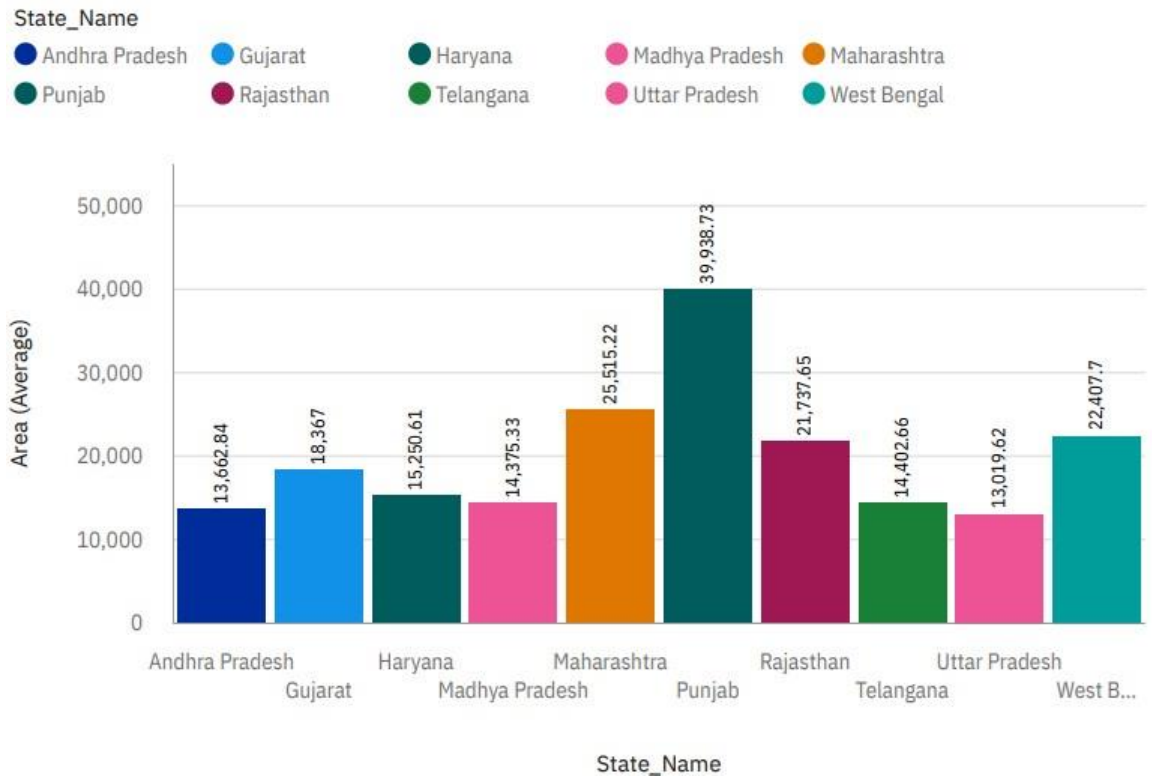
Screenshots:

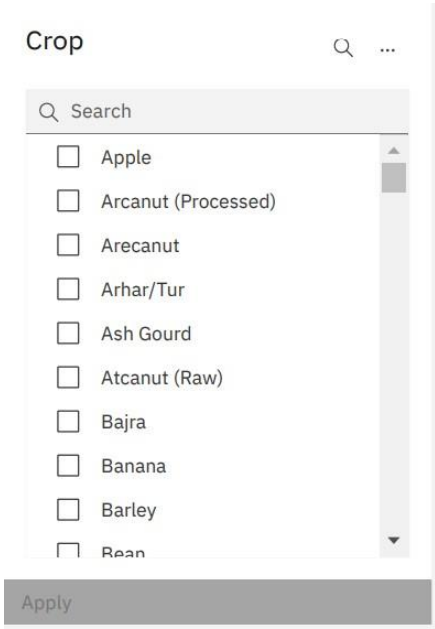


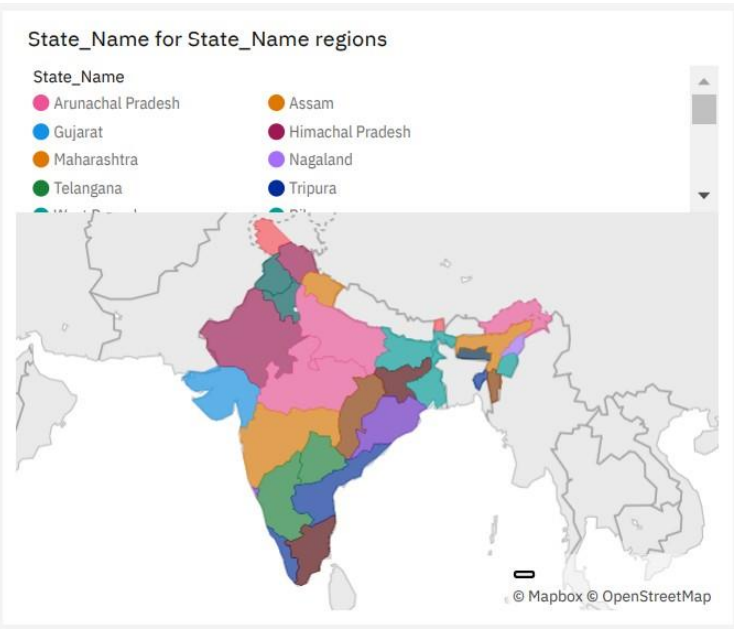

Production by Crop_Year
2
95,654.89
517,254.54
517,214.53
549,672.33
465,466.57
461,985.73
590,955.53
621,201.57
482,125.05
542,306.28
457,305.05
1,037,553.77
619,770.54
957,594.7
801,159.56
12,361.97
1,997 1,998 1,999 2,000 2,001 2,002 2,003 2,004 2,005 2,006 2,007 2,008 2,009 2,010 2,011 2,012 2,013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







State_Name and Crop

1

Crop	State_Name
Apple	Tamil Nadu
Arcanut (Processed)	Karnataka
Arecanut	Andaman and Nicobar I...
	Andhra Pradesh
	Assam
	Goa
	Karnataka
	Kerala
	Meghalaya
	Puducherry
	Tamil Nadu

Season and Crop

2

Crop	Season
Apple	Whole Year
Arecanut	Whole Year
Arhar/Tur	Kharif
	Whole Year
Ash Gourd	Whole Year
Bajra	Kharif
	Rabi
	Whole Year
Banana	Kharif
	Whole Year
Beans & Mutter(Vegetab...	Whole Year

Dashboard-crop yield

Season and Crop

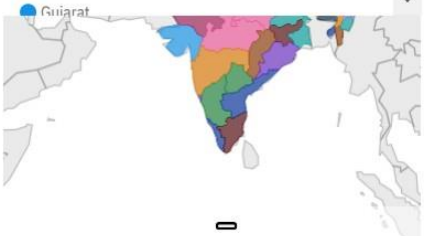
Crop	Season
Apple	Wh

State_Name and Crop

Crop	State_Nan
Apple	Tamil

State_Name for State_Name regions

State_Name
Arunachal Pradesh
Assam
Gujarat

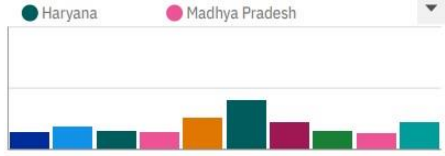


© Mapbox © OpenStreetMap

Area by State_Name colored by State_Name

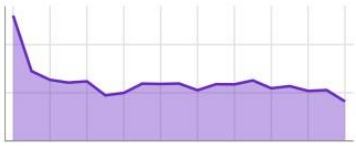
1

State_Name
Andhra Pradesh
Gujarat
Haryana
Madhya Pradesh

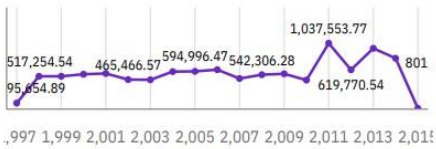


ndhra... Haryana Maharashtra Rajasthan Uttar Pr...
Gujarat Madhya P... Punjab Telangana Wes...

Area by Crop_Year

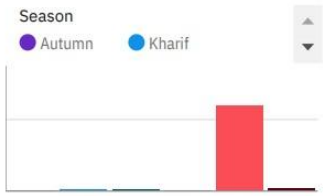


Production by Crop_Year



Production by Season colored by Season

Season
Autumn
Kharif



Prediction:

DatasetName:crop_production.csv

DataPre-processing:

1) Removednullvalues
2) RemovedDependentVariables(State_NamewasdependentonDistrict_Name)
3) Usedone-hot-encodingtoconvertstringstointegervaluedfeatures.

TrainingandTestingsplit:

1) TrainingDataset–75%
2) TestingDataset–25%

AlgorithmsUsed:

1) LinearRegression:
    - MeanSquaredError:2127160913705615.5
    - R-SquareValue:-6.395488603751196

2) RandomForestRegressor
    - MeanSquaredError:7205205429626.706
    - R2score:0.9752199327433567

3) XGBRegressor
    - MeanSquaredError:7320101742812.083
    - R2score:0.9745502426880536

4) DecisionTreeRegressor
    - MeanSquaredError:12144324403888.889
    - R2score:0.9577778943988027

Conclusion:

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

The model is trained and stored in pickle file so that it can be used by the webapplication. Thelibraryused forstoringthemodelinthepicklefileis Joblib.