Project Report for CS-546

Field Monitoring with IoT and AR

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Introduction

The entire project is divided into two modules:

- Predicting Environmental Conditions for the crop
- Visualizing real time data over AR

For the first part, I (Simpal Kumar) have made a website which takes input from the user in the form of Temperature, Humidity and Rainfall and predicts the environmental conditions for the crop. Second module is done separately by `Rahul Narava`.

I've used 20 crops for the experiment and created the dataset manually.

I've calculated the mean for optimal and non-optimal labels for each crop. Then I calculated the Euclidean distance between the user's incoming values ([temp,humidity,rainfall]) and the mean optimal/non-optimal for a crop. Whichever distance is low , is going to return.

Following is the instance of our code:

1.
```
wheat_not_optimal': array([70.  , 27.8, 14.6]),
wheat_optimal': array([23.33333333, 54.44444444, 40.44444444]
```

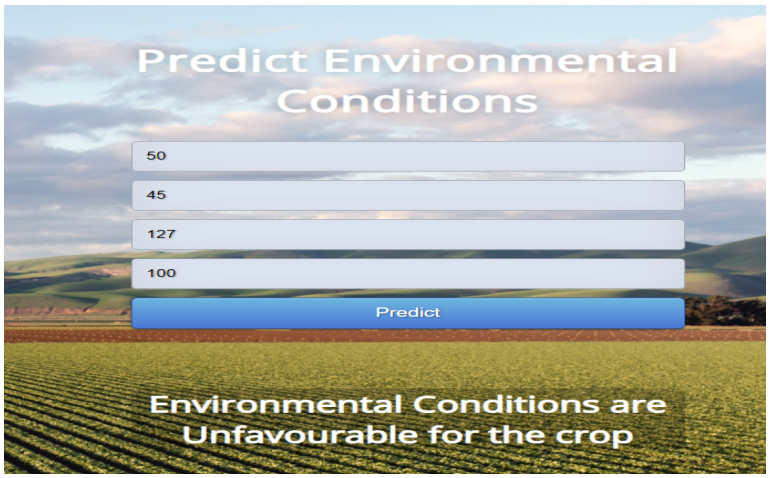
2.
```
user_request =  np.array([45,45,45])
```

3.
```
dist_optimal =  np.linalg.norm(user_request -   mean_df['wheat_optimal'] )
dist_not_optimal =  np.linalg.norm(user_request  - mean_df['wheat_not_optimal'] )
```

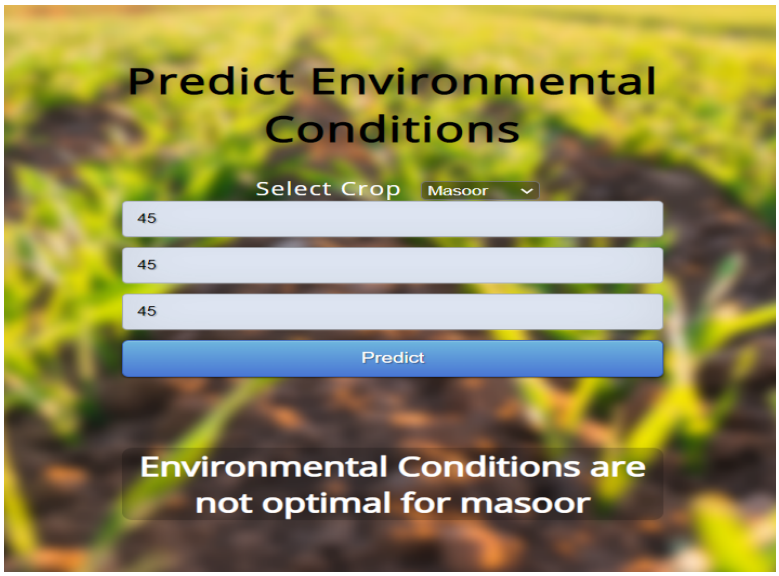
4.
```
if dist_optimal > dist_not_optimal:
  print("Not Optimal")

else :
  print("Optimal")
```

Plot

1. Beginning: In the beginning, crops were not considered and the KNN model was used.



2. Middle: Created a dataset of 20 crops considering what's optimal or non-optimal for the crop.
3. Ending: Created a website showing results for 20 different crops.



Conclusion

We can predict the environmental conditions for a crop by simply entering three values i.e., Temperature , Humidity and Rainfall. Based on Euclidean Distance, we'll get the results.

The project helped to understand the basics of modeling and data manipulation.