SEMESTER PROJECT (4TH SEM 2023-2027)

CROP PREDICTION MODEL

USING
PYTHON
MACHINE LEARNING
FLASK
HTML , CSS

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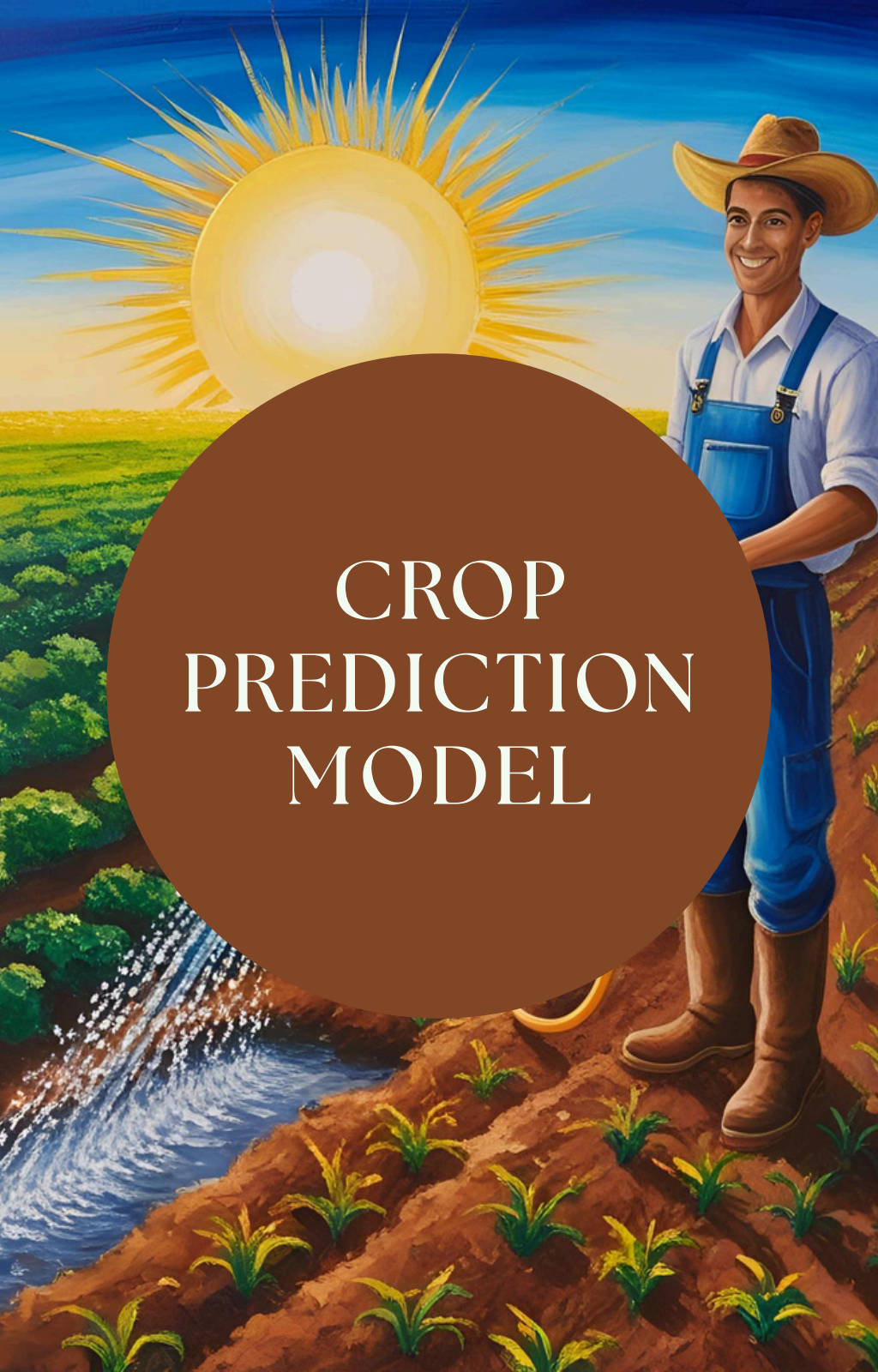
4TH SEMESTER


CROP
PREDICTION
MODEL

BOOST AGRICULTURAL EFFICIENCY WITH MY CROP PREDICTION MODEL, AN AI-DRIVEN SOLUTION DESIGNED TO PREDICT THE MOST SUITABLE CROPS BASED ON CRITICAL ENVIRONMENTAL AND SOIL PARAMETERS. THIS MODEL EMPOWERS FARMERS AND AGRICULTURAL PLANNERS TO MAKE DATA-DRIVEN DECISIONS, ENHANCING YIELD AND SUSTAINABILITY

✨ HOW IT WORKS:

1. DATA COLLECTION:
   - THE MODEL IS TRAINED ON A DIVERSE DATASET CONTAINING INFORMATION ABOUT:
     - TEMPERATURE
     - HUMIDITY
     - PHOSPHORUS
     - NITROGEN
     - POTASSIUM
     - SOIL MOISTURE
   - THESE FEATURES ARE COLLECTED FROM AGRICULTURAL DATASETS AND REAL-TIME ENVIRONMENTAL SENSORS.

- PREDICTION LOGIC:
- THE MODEL USES SUPERVISED MACHINE LEARNING ALGORITHMS (LIKE RANDOM FOREST, DECISION TREE, OR SVM) TO ANALYZE THE INPUT DATA.

- WHEN THE USER INPUTS THE ENVIRONMENTAL PARAMETERS, THE MODEL:
- ANALYZES THE COMBINATION OF SOIL NUTRIENTS AND CLIMATE DATA.
- PREDICTS THE MOST SUITABLE CROP FOR OPTIMAL YIELD IN THOSE SPECIFIC CONDITIONS.

```python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score
import pickle
```

```python
df = pd.read_csv("Crop_recommendation.csv")
```

```python
df.head(5)
```

	N	P	K	temperature	humidity	ph	rainfall	label
0	90	42	43	20.879744	82.002744	6.502985	202.935536	rice
1	85	58	41	21.770462	80.319644	7.038096	226.655537	rice
2	60	55	44	23.004459	82.320763	7.840207	263.964248	rice
3	74	35	40	26.491096	80.158363	6.980401	242.864034	rice
4	78	42	42	20.130175	81.604873	7.628473	262.717340	rice

- ## WEB DEPLOYMENT:
- THE SYSTEM IS DEPLOYED USING FLASK WITH A HTML/CSS FRONT-END, ALLOWING FARMERS AND AGRICULTURAL PLANNERS TO EASILY ACCESS CROP RECOMMENDATIONS.
- USERS CAN INPUT DATA THROUGH A SIMPLE WEB INTERFACE AND RECEIVE INSTANT PREDICTIONS.
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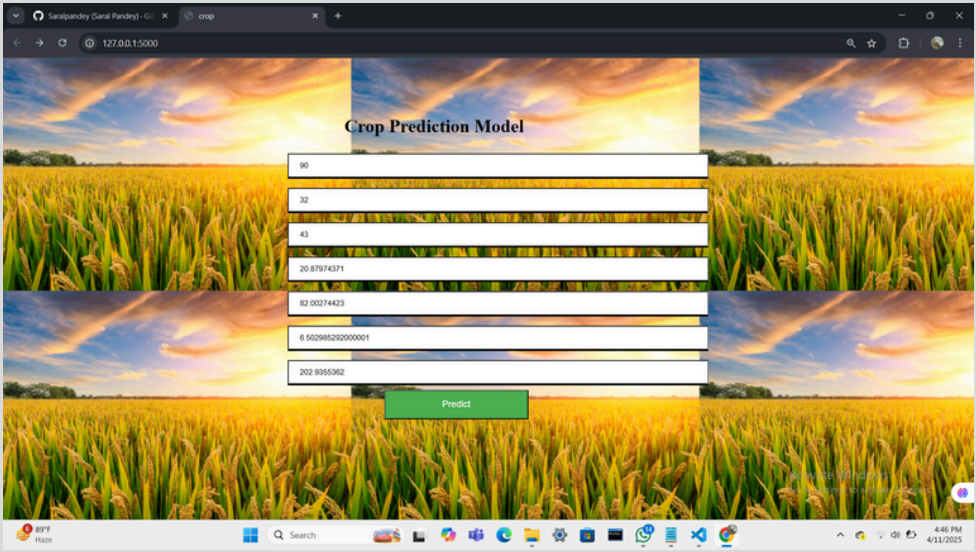
- ## INTERACTIVE DASHBOARD:
- DISPLAYS CROP SUGGESTIONS ALONG WITH CONFIDENCE SCORES.
- PROVIDES INSIGHTS INTO NUTRIENT REQUIREMENTS AND EXPECTED GROWTH RATES.



TECHNOLOGIES USED:

- PROGRAMMING LANGUAGE: PYTHON
- FRAMEWORK: FLASK
- FRONT-END: HTML, CSS
- MACHINE LEARNING TECHNIQUES: RANDOM FOREST, DECISION TREE, SVM
- LIBRARIES: PANDAS, NUMPY, SCIKIT-LEARN

DEPLOYMENT: FLASK APP

GITHUB REPOSITORY LINK IS HERE

HTTPS://GITHUB.COM/SARALPANDEY/CROP-PREDICTION-PROJECT