

Project ID: PW21CBR01

Project Title: Implementation of Precision Agriculture Monitoring System Using Raspberry Pi and Crop Predication Using Machine Learning Algorithm

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Project Abstract:

In phase-1 we have worked on monitoring the crops parameter such as temperature humidity, soil moisture these sensor senses the values and then those data are stored in iot that is cloud thing speak visualization graph can also be fetched in things speak it shows the data's date and temperature value and humidity value. Those details are taken in xml file and used it for predication purpose. Those data are used in prediction, when temperature & humidity value, soil moisture value are accurate. Our aim was to get the accurate value of the parameters and use those in the algorithm. So as of now we are using decision algorithm which is used for regression and classification. In this algorithm we have sub divided in to leaf node and root node is a parent node for classification purposes. Before this we clean our dataset which is used for the project. First we go for pre-processing the dataset, and then splitting of dataset in to training and testing purpose in the ratio of 20:80. 20 is for testing & 80 is for training. We must train the machine as per our requirements so that we can get the accurate and precise accuracy value. In the dataset if we found any missing data we go for filling the missing field using mean method. Mean of the entire column gives us the value to fill the missed fields in the dataset, this is done because if there is any missing data in dataset then we may not get the extract accuracy value as expected. So we fill the missing values. We also created a simple GUI which is used to display outcome from the prediction. For that we have used tkinter. Four number of field such as temperature, humidity, soil moisture, ph. Sensor, when we enter those value as per the dataset give to the algorithm it predicts the outcome that is name of the crop which can be grown in those particular conditions.

[illegible]

The screenshot shows a terminal window on a Raspberry Pi. The user is in the directory `~/Desktop/project`. They run `ls` to list files, showing `code.py`, `crop_csv_file_old.xlsx`, `crop_csv_file_new.xlsx`, `main.py`, `mcp.py`, `relay.py`, `send_sms_code.py`, and `soil_moisture.py`. Then they run `python3 crop_anusha_pesot.py`. The output shows the index range (0 to 49998), the number of columns (11), and a list of columns with their data types. The columns are: State_Name (object), District_Name (object), Crop_Year (int64), Season (object), Crop (object), Temperature (int64), Humidity (int64), pH (float64), Soil_Moisture (int64), Area (float64), and Production (float64). The memory usage is 3.4 MB and the accuracy is 4.7. The terminal also shows the directory structure and the file listing.

```
pi@raspberrypi:~$ pwd
/home/pi
pi@raspberrypi:~$ cd 0
Desktop/ Documents/ Downloads/
pi@raspberrypi:~$ cd 0
Desktop/ Documents/ Downloads/
pi@raspberrypi:~$ cd Desktop/
pi@raspberrypi:~/Desktop$ cd project/
pi@raspberrypi:~/Desktop/project$ ls
code.py          SWT11.py        mcp.py          soil_moisture.py
crop_csv_file_old.xlsx  flame.py        relay.py
crop_csv_file_new.xlsx  main.py         send_sms_code.py
pi@raspberrypi:~/Desktop/project$ cd ..
pi@raspberrypi:~/Desktop$ python3 crop_anusha_pesot.py
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 49999 entries, 0 to 49998
Data columns (total 11 columns):
 #   Column              Non-Null Count  Dtype
---  -
0   State_Name          49999 non-null  object
1   District_Name       49999 non-null  object
2   Crop_Year           49999 non-null  int64
3   Season              49999 non-null  object
4   Crop                49999 non-null  object
5   Temperature         49999 non-null  int64
6   Humidity            49999 non-null  int64
7   pH                  49999 non-null  float64
8   Soil_Moisture       49999 non-null  int64
9   Area                49999 non-null  float64
10  Production          49999 non-null  float64
dtypes: float64(3), int64(4), object(4)
memory usage: 3.4+ MB
accuracy is 4.7
['Arhar/Tur']
```

