SRM VALLIAMMAI ENGINEERING COLLEGE
(AUTONOMOUS INSTITUTION)
DEPARTMENT OF INFORMATION TECHNOLOGY

THE ACADEMIC YEAR 2022-2023(EVEN SEMESTER)

PROJECT PHASE 1- SECOND REVIEW

AI BASED WILDFIRE PREDICTION

GUIDED BY: Dr.S.NARAYANAN B.E., M.Tech., Ph.D.,
Assistant Professor (Sel.G)

TEAM MEMBERS:

HARISHANKARAN B – 142219205031

HARSHAVARTHAN H – 142219205032

JAIPRAKASH M – 142219205035

JEDIN TONY J - 142219205040

INTRODUCTION

- Forest resources are the most important natural resources on earth.
- Wildfires occur naturally under certain Meteorological.
- Wildfires are destructive and spread rapidly.
- Predicting before the start of a wildfire is very useful.
- Forest fires are 3 types Crown fires, surface fires, and Ground fires.
- Simple logistic regression model used to train data.
- It has a high accuracy rate of prediction.

OBJECTIVES

- To Prevent Forest Fires.
- Save the Animals and Habitants using ML algorithm.
- Train the machine with historic weather data.
- Weather data includes temperature, humidity, and oxygen.
- In logistic regression, it returns true(1) or false(0) by probability.
- If the probability is higher then inform the fire prevention team.
- By prior Informing Wildfire can be prevented.

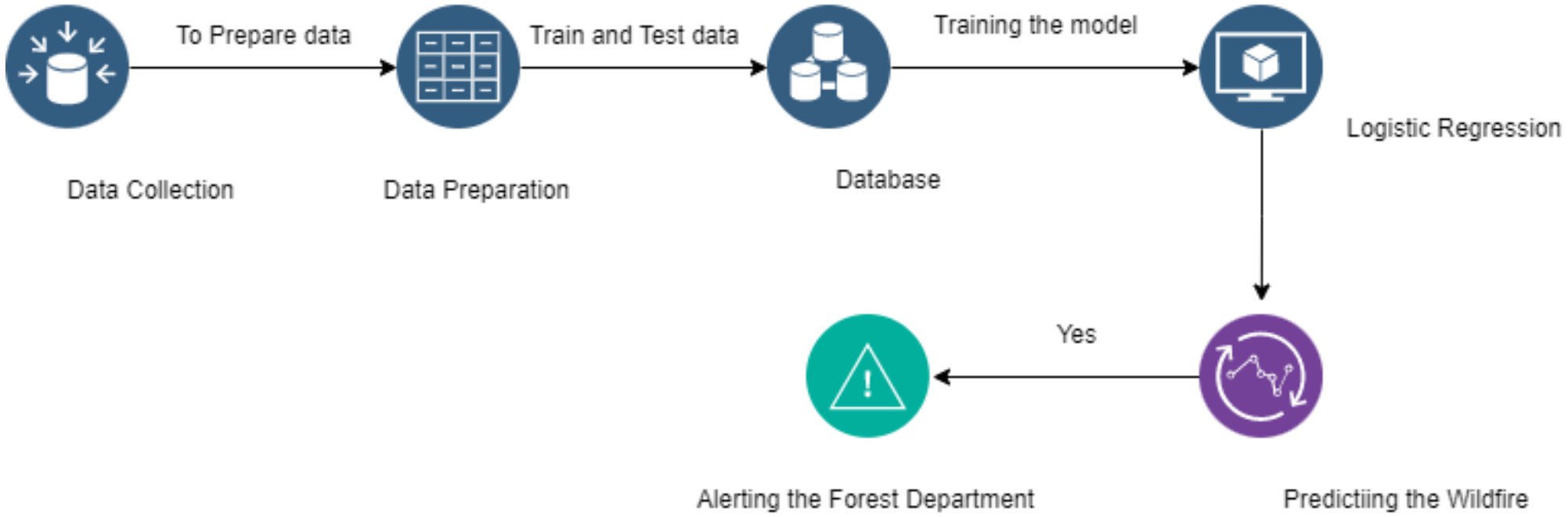
LITERATURE SURVEY

S.NO	TITLE	YEAR	METHODOLOGY	BENEFITS
1.	A Neural Network Model for Wildfire Scale Prediction Using Meteorological Factors	2019	A backpropagation neural network (BPNN), a recurrent neural network (RNN), and long short term memory (LSTM) models are deployed.	A backpropagation neural network (BPNN), a recurrent neural network (RNN), and long short term memory (LSTM) models are deployed.
2.	A backpropagation neural network (BPNN), a recurrent neural network (RNN), and long short term memory (LSTM) models are deployed.	2013	A backpropagation neural network (BPNN), a recurrent neural network (RNN), and long short term memory (LSTM) models are deployed.	Based on Information received at base station Intelligent decision were made.

LITERATURE SURVEY

S.NO	TITLE	YEAR	METHODOLOGY	BENEFITS
3.	Forest Fires Segmentation using Deep Convolutional Neural Networks	2021	To Overcome limitation like false detection of fire pixels. They propose three deep convolutional networks U-Net, U2-Net, and Efficient Seg.	This models shows good performance in terms of accuracy and proved reliability to segment fire pixels
4.	Decision Tree based System on Chip for Forest Fires Prediction	2020	This method based on Intellectual property core development for forest fire prediction. To speed up the process by decision locally at sensor node level.	Hardware implementation results of the decision tree based forest fires prediction system on chip show that the developed IP core.
5.	Deep Learning Approach to Predict Forest Fires Using Meteorological Measurements	2021	This project rely on Forest Fire Weather index Information. Long short term memory (LSTM) model used to deploy prediction of forest fire.	Since various metrics are used to evaluate the accuracy of proposed model. Results shows proposed models produce reasonable predictions.

ARCHITECTURE DIAGRAM



MODULES DESCRIPTION

1. Data Collection

Collecting the weather data to train the model.

2. Data Preparation

Prepare the collected data to remove outliers, void, and duplicate data.

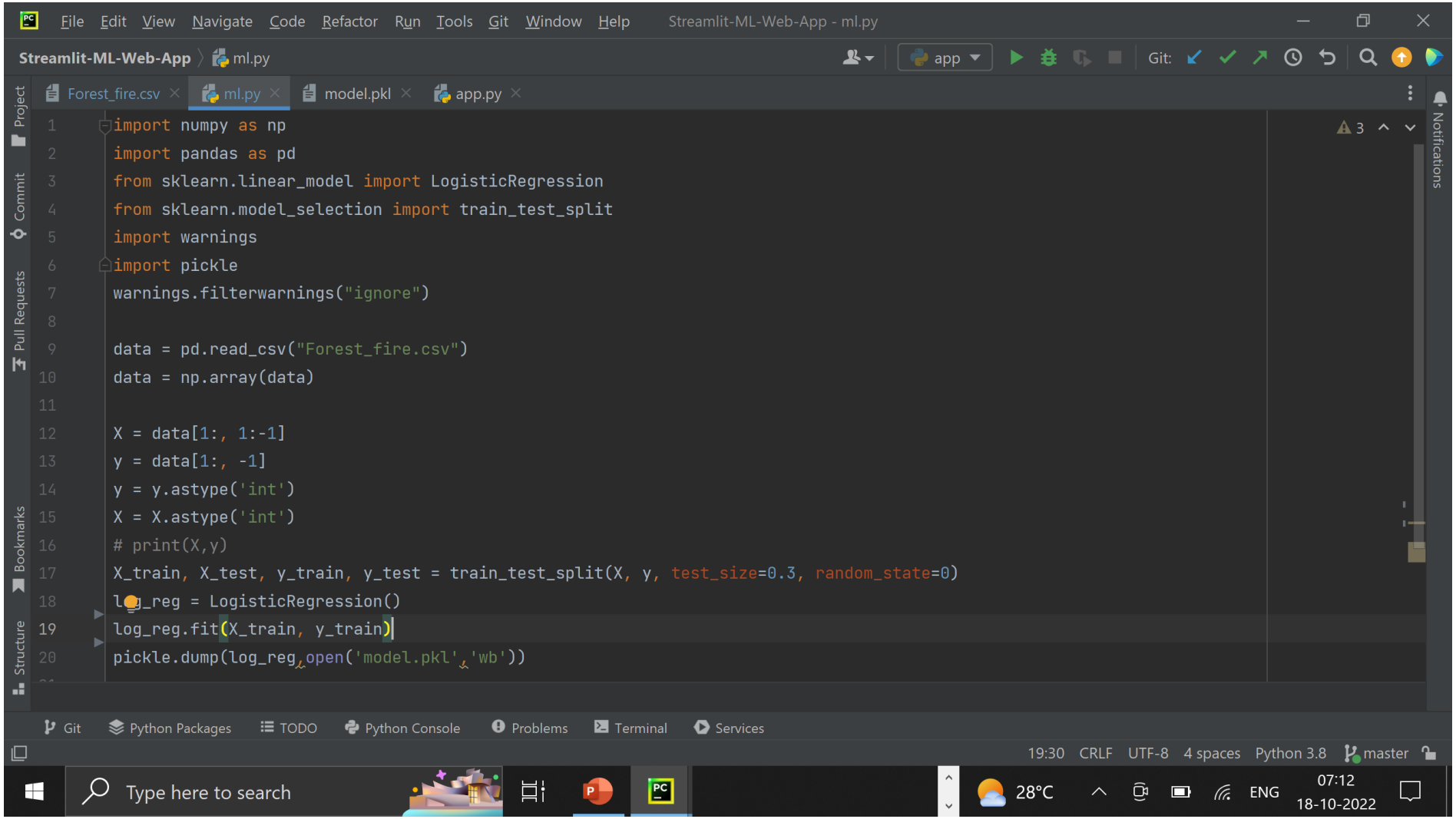
3. Train and Test

To train and test data the machine with the Logistic Regression.

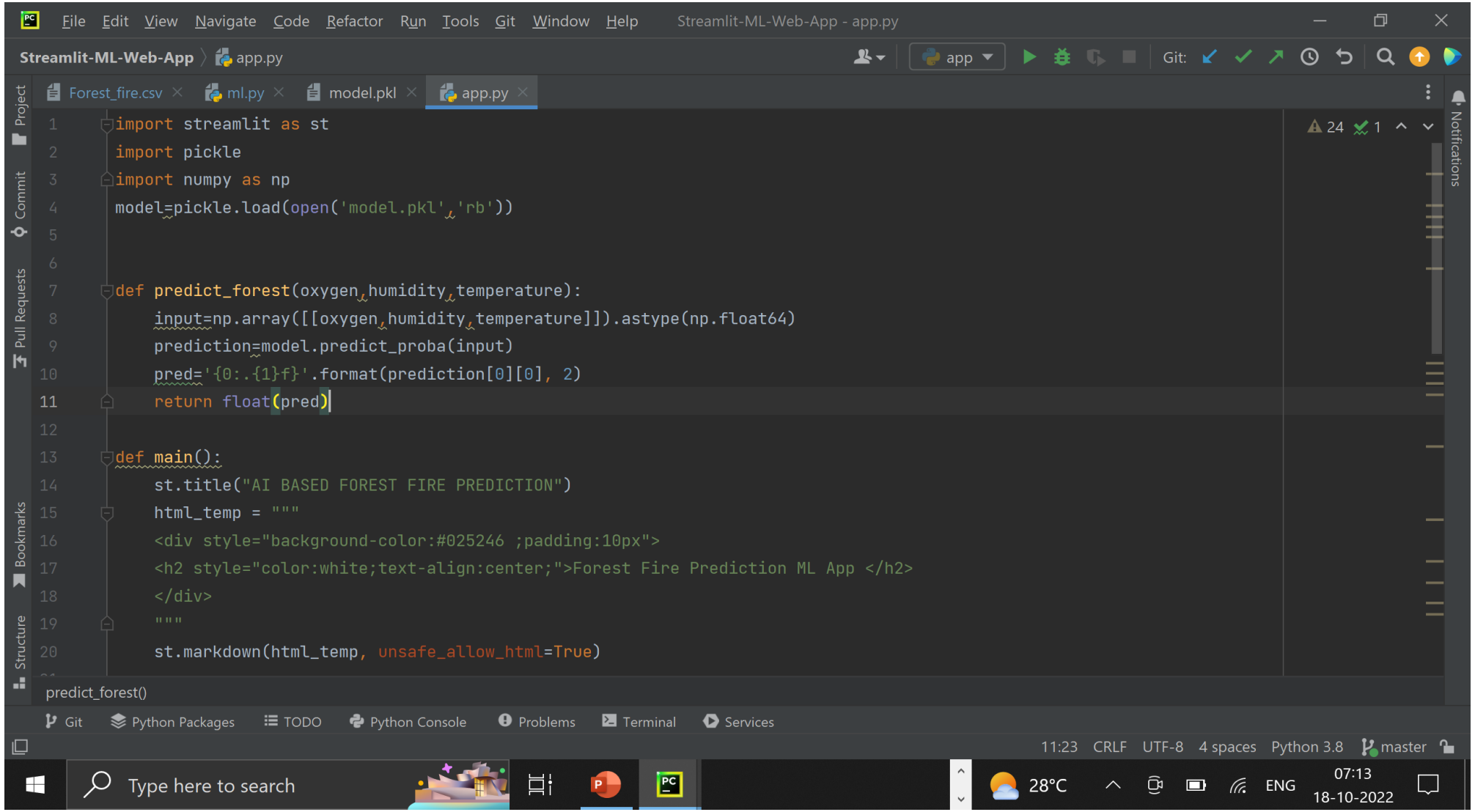
4. Streamlit app

To Run the ML model on localhost and it fetches user input.

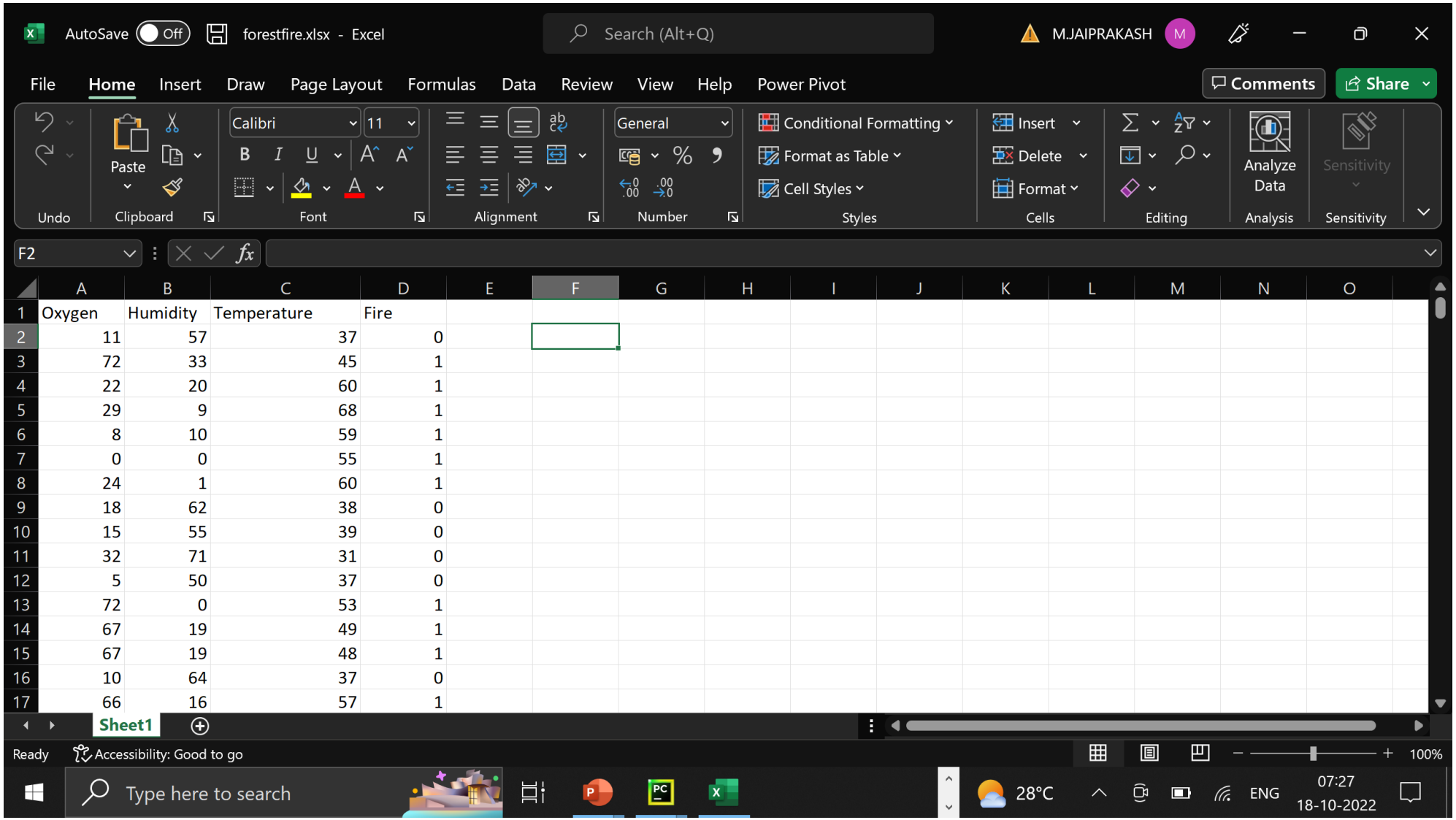
ML model


File Edit View Navigate Code Refactor Run Tools Git Window Help
Streamlit-ML-Web-App - ml.py
Streamlit-ML-Web-App
ml.py
app
Git:
Forest_fire.csv
ml.py
model.pkl
app.py
import numpy as np
import pandas as pd
from sklearn.linear_model import LogisticRegression
from sklearn.model_selection import train_test_split
import warnings
import pickle
warnings.filterwarnings("ignore")
data = pd.read_csv("Forest_fire.csv")
data = np.array(data)
X = data[1:, 1:-1]
y = data[1:, -1]
y = y.astype('int')
X = X.astype('int')
# print(X,y)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=0)
log_reg = LogisticRegression()
log_reg.fit(X_train, y_train)
pickle.dump(log_reg,open('model.pkl','wb'))
Project
Commit
Pull Requests
Bookmarks
Structure
Notifications
Git
Python Packages
TODO
Python Console
Problems
Terminal
Services
19:30 CRLF UTF-8 4 spaces Python 3.8 master
Type here to search
28°C
ENG
07:12
18-10-2022

Streamlit app

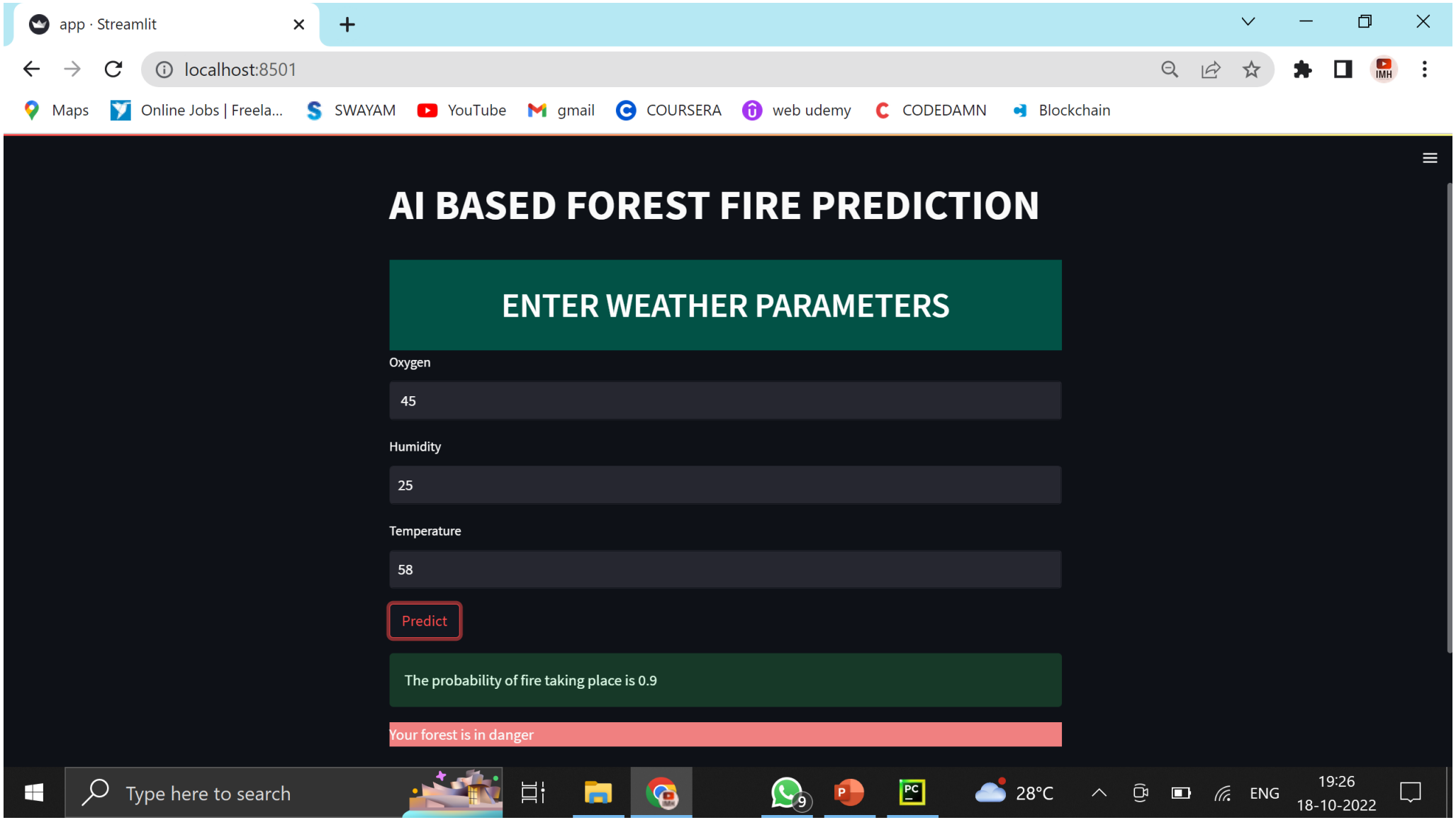


Prepared data



	A	B	C	D
1	Oxygen	Humidity	Temperature	Fire
2	11	57	37	0
3	72	33	45	1
4	22	20	60	1
5	29	9	68	1
6	8	10	59	1
7	0	0	55	1
8	24	1	60	1
9	18	62	38	0
10	15	55	39	0
11	32	71	31	0
12	5	50	37	0
13	72	0	53	1
14	67	19	49	1
15	67	19	48	1
16	10	64	37	0
17	66	16	57	1

OUTPUT


app · Streamlit
localhost:8501
Maps
Online Jobs | Freela...
SWAYAM
YouTube
gmail
COURSERA
web udemy
CODEDAMN
Blockchain
AI BASED FOREST FIRE PREDICTION
ENTER WEATHER PARAMETERS
Oxygen
45
Humidity
25
Temperature
58
Predict
The probability of fire taking place is 0.9
Your forest is in danger
Type here to search
28°C
ENG
19:26
18-10-2022