WEATHER FORECASTING USING PYTHON

ABSTRACT:

Weather forecasting is the application of science and technology to predict the state of the atmosphere for a given location. Ancient weather forecasting methods usually relied on observed patterns of events, also termed pattern recognition. For example, it might be observed that if the sunset was particularly red, the following day often brought fair weather. However, not all of these predictions prove reliable. Here this system will predict weather based on parameters such as temperature, humidity and wind. User will enter current temperature, humidity and wind. System will take this parameter and will predict weather (rainfall in inches) from previous data in database (dataset). The role of the admin is to add previous weather data in database, so that system will calculate weather (estimated rainfall in inches) based on these data. The climatic condition parameters are based on the temperature, wind, humidity, rainfall and size of data set. The data is collected from the temperature and humidity sensor called DHT11 sensor, which helps in detecting the temperature and humidity values of a particular region or location. The raspberry pi is used for storing the collected data to the cloud, with the help of Ethernet shield for uploading the data online. The data stored in cloud is generated in the form of CSV, JSON, XML files which is used for further analysis. The correlation analysis of the parameters helps in predicting the future values. The ARIMA model that gives better results for time-series data is used for predicting the values for forthcoming.

INTRODUCTION:

Weather forecasting is the prediction of the state of the atmosphere for a given location using the application of science and technology. This includes temperature, rain, cloudiness, wind speed, and humidity. Weather warnings are a special kind of short-range forecast carried out for the protection of human life. Once calculated manually based mainly upon changes in barometric pressure, current weather conditions, and sky condition or cloud cover, weather forecasting now relies on computer-based models that take many atmospheric factors into account. Human input is still required to pick the best possible model to base the forecast upon, which involves pattern recognition skills, teleconnections, knowledge of model performance, and knowledge of model biases.

The inaccuracy of forecasting is due to the chaotic nature of the atmosphere, the massive computational power required to solve the equations that describe the atmosphere, the land, and the ocean, the error involved in measuring the initial conditions, and an incomplete understanding of atmospheric and related processes. Hence, forecasts become less accurate as the difference between current time and the time for which the forecast is being made (the range of the forecast) increases. The use of ensembles and model consensus helps narrow the error and provide confidence in the forecast.

There is a vast variety of end uses for weather forecasts. Weather warnings are important because they are used to protect life and property. Forecasts based on temperature and precipitation are important to agriculture, and therefore to traders within commodity markets. Temperature forecasts are used by utility companies to estimate demand over coming days.

On an everyday basis, many people use weather forecasts to determine what to wear on a given day. Since outdoor activities are severely curtailed by heavy rain, snow and wind chill, forecasts can be used to plan activities around these events, and to plan ahead and survive them.

CODING:

```
import requests

city=input('input the city name:')

print(city)

print('Displaying Weather report for: ' +city)

url = 'https://wttr.in/{}'.format(city)

res requests.get(url)

print(res)

data=res.text

print(data)
```

CONCLUSION:

We successfully predicted the rainfall using the linear regression but here this is not very accurate only sometimes any way it depends upon the climate changes to season to season. Here we are taking only summer season weather data set it only useful to predict rainfall in summer season. Finally, it is agreed that we made an attempt on the following points:

1. The description of the purpose the scope and applicability of this project.
2. We specify the system's necessary specs as well as the actions that can be performed on these objects.
3. We define the system's required specifications and the actions that can be taken on these objects.
4. We comprehend the problem domain and create a system model that represents the operations that can be performed on the system.
5. We went into great lengths about the features and processes, providing a lot of important information.
6. We created the user interface as well as system security issues.
7. Finally, the system is built and tested in accordance with the test cases