Birla Institute of Technology & Science, Pilani
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TERM PAPER

ON

WEATHER FORECASTING ON ANY LOCATION

BY

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ABSTRACT:

Weather forecasting is a important technology that is used for predicting rainfall,wind speed ,in this project we will predict the temperature wind speed and many other parameters in whether at any location all over the globe and this is made by collecting data from previous information and performing various operations and predicting the weather and in this we can use artificial and machine learning to get accurate values and expected outcomes as the data set is already given we can get 90% outcome by using linear regression model

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1.1 INTRODUCTION:

Weather forecasting:

Weather means the condition of air on the earth at a particular place and time. It is a continuous multidimensional, dynamic and chaotic process. These properties make weather forecasting a change at every point of time . Forecasting means predicting the unknown condition from previous data. Weather forecasting is one of the most scientifically and technologically challenging problems around the world in the last century. To make an accurate prediction is compulsory for various outcomes , one of the major challenges that scientists are challenging all over the world. Since ancient times, weather prediction has been one of the most common theories. Scientists have tried to forecast meteorological conditions using various methods, some of these methods being more informative than others methods.

TYPES OF WEATHER FORECASTING:

1) Persistence Forecasting
2) Synoptic Forecasting
3) Statistical Forecasting
4) Computer forecasting

2 .WORKING :

Forecasting whether using python using wttr it is a console oriented weather forecast service that supports various information representation methods like png for graphical use. And on loading various data sources and in python the modules used are requests a HTTP library

Artificial intelligence here helps us to predict the weather using previous data that was already collected from the user in weather forecasting in prediction of weather and weather parameter impact on forecasting.

Development of code:

```
import requests

city = input('name of the city')

print(city)

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

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

res = requests.get(url)

print(res.text)
```

Whether forecasting here works on the principle of data .

This will predict the weather for next three days in the particular location that we mentioned in the code

Example :as we enter DELHI as the location the output will be

4

```
name of the cityDELHI
DELHI
Displaying whether report for: DELHI
Weather report: DELHI

                Smoke
      .--.      69 °F
   .-(    ).    ↓ 4 mph
  (___.__)__)   0 mi
                0.0 in
```

Fri 26 Nov

Morning	Noon	Evening	Night
\ / Sunny .-. 73 °F – ( ) – ↓ 1-2 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Sunny .-. +86(80) °F – ( ) – ↓ 1-2 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. +82(78) °F – ( ) – ← 1 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. 73 °F – ( ) – ← 2-4 mph `-’ 6 mi / \ 0.0 in | 0%

Sat 27 Nov

Morning	Noon	Evening	Night
\ / Sunny .-. 71 °F – ( ) – ↖ 4-5 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Sunny .-. +84(80) °F – ( ) – ← 3-4 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. +78(77) °F – ( ) – ← 4-5 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. +71(75) °F – ( ) – ← 4-8 mph `-’ 6 mi / \ 0.0 in | 0%

Sun 28 Nov

Morning	Noon	Evening	Night
\ / Sunny .-. 71 °F – ( ) – ↖ 4-6 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Sunny .-. +82(80) °F – ( ) – ↑ 3-4 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. +78(77) °F – ( ) – ↘ 2-3 mph `-’ 6 mi / \ 0.0 in | 0%	\ / Clear .-. 73 °F – ( ) – ↘ 2-4 mph `-’ 6 mi / \ 0.0 in | 0%

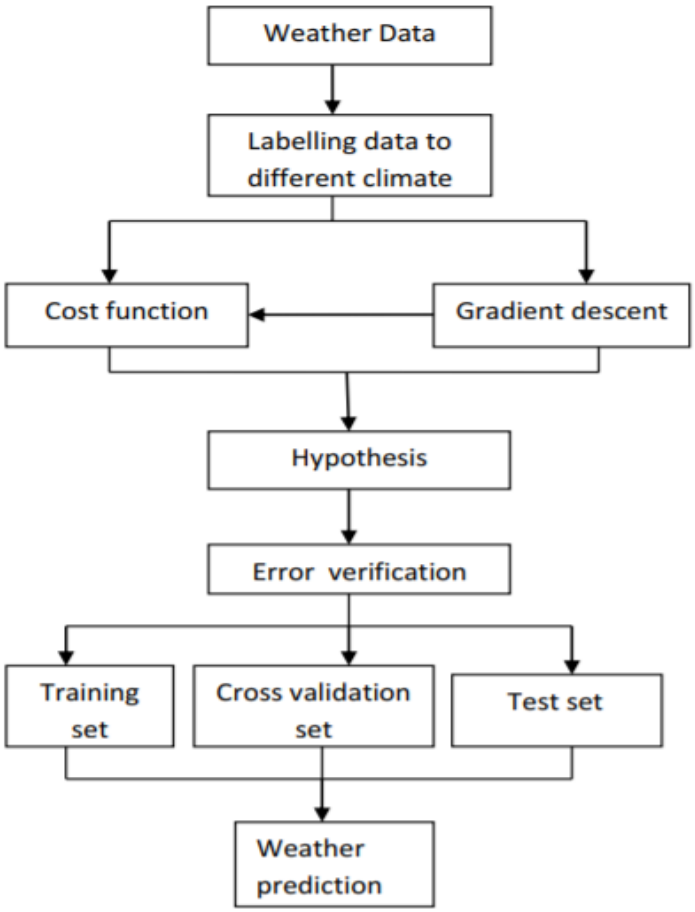
```
Location: Delhi, India [28.6517178,77.2219388]

Follow @igor_chubin for wttr.in updates
```

Here this location gives the predicted whether report and it also mentions parameters

S no	Day	Parameters
1	26-11-2021	Temperature,wind speed,sunny or rainy
2	27-11-2021	Temperature,wind speed,sunny or rainy
3	28-11-2021	Temperature,wind speed,sunny or rainy

The working principle is based on first the weather data will be entered and then calculating the data and error verification running all the test sets validating and then predicting the weather

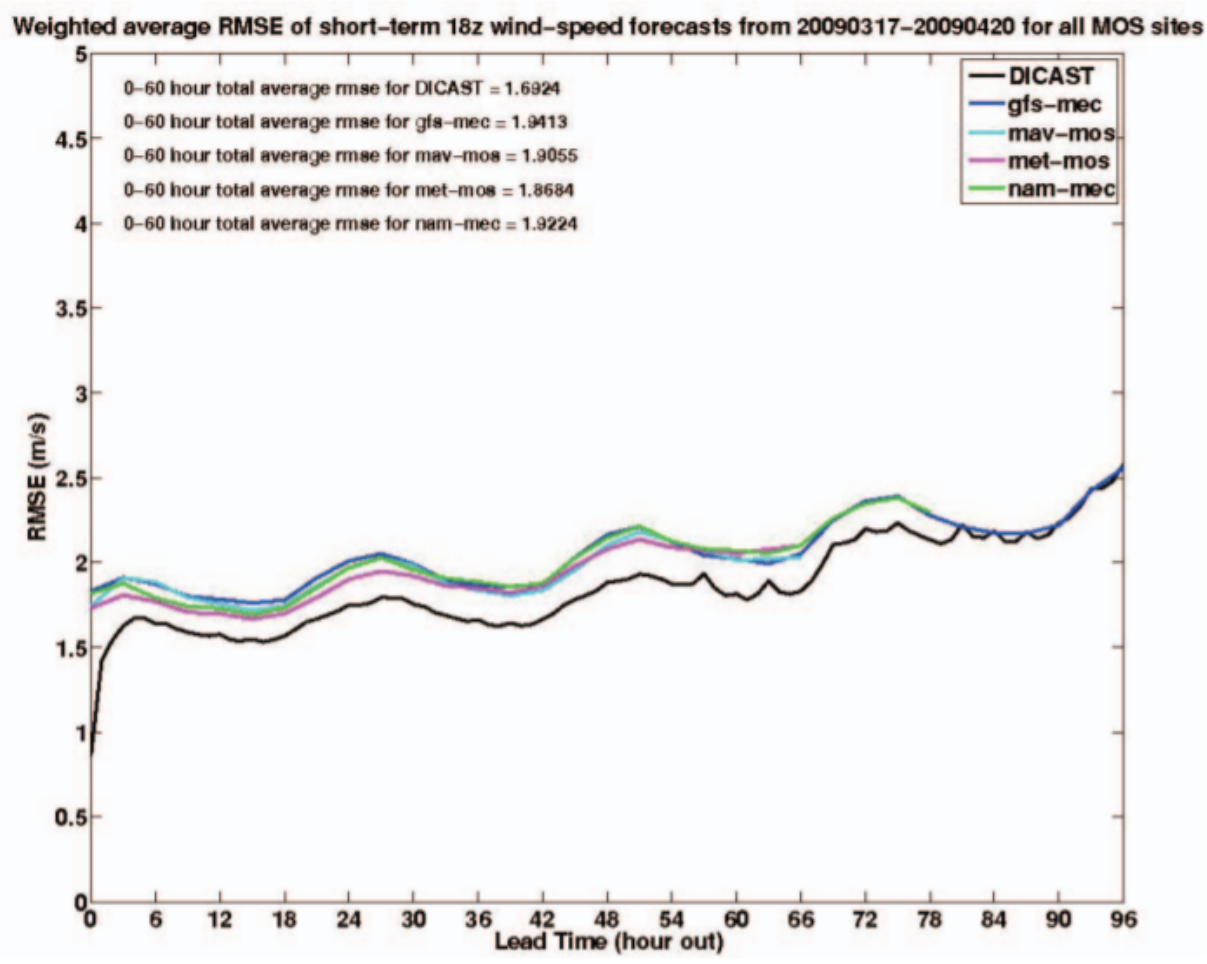
The flowchart is as follows:



USING ML IN WEATHER PREDICTION:

One of the greatest successes of using AI in weather forecasting was the Dynamical Integrated foreCast (DICast) System.

machine-learning methods have been applied by the National Center for Atmospheric Research (NCAR) to various needs of whether prediction for agriculture,for safe transportation,



Journals:

1.
The African SWIFT project: growing science capability to bring about a revolution in weather prediction.

Published Online: 05 Aug 2021

2.
Distributed Numerical Weather Prediction via Satellite

Published Online: 01 Dec 1997

3.
Method for calculating schedule delay considering weather conditions

Modified: 17 Dec 2014

4.
Use of Medium-Range Numerical Weather Prediction Model Output to Produce Forecasts of Streamflow

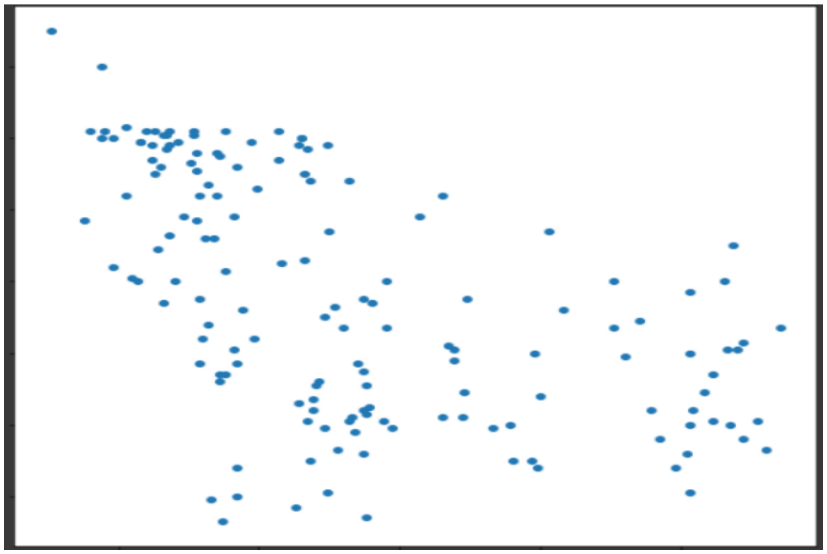
Published Online: Feb 2004

5.
Progress in subseasonal to seasonal prediction through a joint weather and climate community effort

Published 26th march 2018

USING LINEAR REGRESSION IN WEATHER PREDICTION:

Linear prediction is a machine learning algorithm which works on supervised learning.The data set contains temperature,humidity,and other parameters and plotting the graph based on the data by using python libraries



And by using the code snippets we can train the data and we can get 93% accuracy for weather forecasting and we can improve the accuracy by using neural networks and keras

SUMMARY

The main theme of the project is to predict the whether using artificial intelligence and data that is already provided we will provide the data to the ai and it will make some changes in the program and it reduces error using various techniques and using of algorithm will make the data more precise and accurate

Conclusion and references:

This project helps us to know more about the weather forecasting in detail and application of machine learning and artificial intelligence in detail and using python code to demonstrate the expected result and in this project the resources that are used are from journals and the in the code we had seen that implementation of code for the weather prediction and the machine learning has made the outcome more accurate linear regression data provides the information and data in a organized manner

REFERENCES:

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https://www.researchgate.net/publication/268200906_Method_for_calculating_schedule_delay_considering_weather_conditions

https://journals.ametsoc.org/view/journals/bams/78/12/1520-0477_1997_078_2755_dnwpvs_2_0_co_2.xml

https://medium.com/swlh/creating-a-model-for-weather-forecasting-using-linear-regression-b18c1590e8d7