Weather and News Display, analysis and prediction.

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Abstract *— A project aimed to create a website that contains all the relevant data related to weather was created to solve the problem of user of not wondering at random site to get data. The basic layout and framework of the website is created using web developing tools such as HTML, CSS and JavaScript. The project contains elements such as displaying weather using API, news using API and provide recommendation of food and clothing according to the given weather condition. The prediction of favorability of planning any outdoor activity is done using a machine learning model created in Google collab, which classifies and displays answer as yes or no using the Naive Bayes classifier algorithm. The project also aims to provide the data analysis of monthly temperature data in India for an extended period of time i.e., from 1901 to 2017. This analysis aims to provide user with an idea of how the temperature could be in the coming or ongoing month. Thus, the collaboration of various technologies resulted in creation of an easy, user-friendly website made with HTML, CSS, JAVASCRIPT and MACHINE LEARNING*

that helps user to find all the required data at one place and hencesave his valuable time.

Keywords *—API Concept, Data Analytics, Naïve bayes, News API,openweathermap.org, Web development.*

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I. INTRODUCTION

It is 21st century and internet has revolutionized the world with its unlimited potential. All thing which are needed for development of an individual as well as that of a firm is available on internet. Important elements such as weather, news which affect daily life of masses and is needed for any planning is available on internet, but the problem with the present case scenario is that internet is vast and it becomes difficult to find every relevant information on one single platform with accuracy. To solve this problem, The project titled 'Weather Display and Analysis with news and suggestion' was planned to solve this issue for people. Weather data is important aspect in planning any event in today's dynamic world and hence its prediction becomes equally important for smooth execution of the planned tasks. Forecasts based on temperature and precipitation are important to agriculture, and therefore to traders within commodity markets. The studies in this paper are based on the facts and data collected from the year 1901 to 2017.Besides the wearing appropriate clothes according to seasons and being updated with the latest ongoing events in the world are important skills in today's world. This project just tries to contribute by supplying these demands easily.

II. LITERATURE REVIEW

In past years, many researchers work on weather prediction using different techniques. Some are explained in this section. In this research paper comparative study on weather prediction using ML Techniques data. Researcher analysis on different Machine Learning Algorithms. Firstly, describes weather prediction has many different problems. Even the simplest weather predictions are not perfect. Prediction of forecast varies from one to two degrees of the actual temperature. Although this accuracy of weather prediction is not bad, as predictions are made for further in time. Also, sometimes accuracy of weather prediction can be even worse. Furthermore, weather prediction in some areas where the climate is not consistence, is off by even more. Machine Learning Algorithms and many classifiers' names Naive Bayes Bernoulli, Logistic Regression, Gaussian, support vector machine

are uses for evaluate more accurate output [1].

The main goal of this study is to present a review of machine learning methods and applications within the main topics of meteorology as well as climate analyses. In this paper they are trying to predict the future research direction of these field, with the main conclusion being that machine learning method will be a key feature in future weather forecasting. Machine learning helps to improve analysis and find links between different predictors and climate conditions in different issues. Simultaneously it can also be used to generate high resolution data and to explore the drivers of climate change. Machine learning methods will be a key feature in future weather forecasting [2].

III. METHODOLOGY/EXPERIMENTAL

A. Materials/Components/Flowchart/Block Diagram/Theory

In the prediction part of the project, machine learning model [8] was used to predict if there was a chance to play outdoor game or not. The tools used for the project were google collab environment and Python libraries such as Pandas, sklearn [3]. The naïve bayes algorithm [3] was used as a classifier algorithm to classify and predict the chances of playing out was positive or negative. The dataset [6] used for prediction consisted of parameters such as outlook, humidity, temperature and wind. This data was linked to the collab by uploading dataset on GitHub [6] and add its link in the URL. The values of these parameters were then coded into numbersfor better interpretation of the data by the machine. This task was accomplished by using class Label Encoder imported from sklearn. After the conversion of values into numerical data, the string values of the dataset was cleaned up as there was no further requirement and the dataset was split into input data and output results(target). The naïve bayes algorithm was then applied to find the probability whether the day is good enough for play or not. After running the test, it was found that the output was predicted with an accuracy of 85.71428571428571%. Finally, the prediction of the desired day was done by adding the parameter of the required day.

We decided to use the API (Application Programming Interface) concept to display real time weather and news on the website. The API used in our website for weather is taken from 'openweathermap.org'[4] and for the real time news we have used 'newsapi.org'[5]. To fetch information that we get from API we have used JavaScript.

In weather display we have included many things like temperature, wind speed, humidity and description of weather. At first, we tried to collect the information given by the API and display it on console and then displayed it on the website successfully. The API we have chosen for weather, functions mainly on latitude and longitude [4] but the user justhas to enter a valid city name for which he wants weather. Then we made the input bar interactive where user inputs his city. The city given by user then goes into the API url[4] andwe get the weather details of that particular city on the console. Lastly, we displayed the console data on the website using JavaScript. The basic framework and design of webpage was accomplished using HTML and CSS.

In the news section we have added news that shows us daily news. It displays top headlines from all over the world. For this we have used news API [5] that calls news from specific news channels and sites. The API we used is from ‘newsapi.org’ [5] which collects news, displays it on console and next on we have displayed it on webpage using JavaScript. The fetching and calling of API and its details are done by JavaScript and presented in well format on webpageby CSS and HTML.

A button named "CLOTHES RECOMMENDATION" is added on main website, when clicked on it a webpage opens where there are two choices for the user to go and check clothes recommendation. Those two choices are with 'season' and with 'temperature'. When clicked on 'with season' a webpage opens where a text box is present where the user hasto input a season. Choose the season and enter that season in the text box followed by clicking to the submit button recommends clothes. When clicked on 'with temperature' a webpage opens where a text box in which temperature in degree Celsius is written. Enter the desired temperature and Click on Submit button then it recommends clothes.

In the data analysis [7] of monthly temperature from the dataset, the data set was used from the Kaggle website. In the process the python

libraries pandas, numpy, ploty and datetime was used to arrange the data set in an interpretable way. The data was uploaded on GitHub and fetched as raw data in the collab environment. Datetime was used to set data in a certain timeframe to display visual data in a better format. Various charts and graphs were developed using python library ploty which displays data in vivid forms.

The entire website is designed using CSS (Cascading Style Sheets) which provides basic designing to the website and is easily linkable to the markup. We have made the buttons as much interactive as we can and have added some interesting images to attract the user.

IV. RESULTS AND DISCUSSIONS

The completed website includes weather display on a go, news displaying all current events, and weather prediction. To access the data on website, the user needs to enter the name of city to check the weather. Machine learning model which successfully predicts whether it is favorable to go outside clothes recommendations where on entering specific parameters, news and all the other data is available on just oneclick of user.

V. MATH

- Bayes Theorem as classifier.

$$P(A|B) = \frac{P(B|A) \times P(A)}{P(B)}$$

VI. LIMITATIONS

- This is a website hence; the internet connection is mandatory for accessing the data from website.
- The machine learning model is a classifier model hence it only works on fixed parameters and do not take into account any externally provided data.
- The website cannot handle large number of users at once as the ram of the hosting machine is limited.

VII. FUTURE SCOPE

The data set used in the analysis of temperature can further be used to make a linear regression model which can make predictions on the temperature in the upcoming months. Various other weather parameter prediction such as rain, humidity can be added with required details. A notification through email service can be introduced that alerts the user about the future weather parameters.

VIII. CONCLUSION

The website is useful to start your day at one go. It provides almost everything that a person needs to start his daily chores very easily. We can further extend this project by making it more user friendly and can also improve the user interface of the website. The accuracy of the machine learning model that we have trained is 85.71428571428571%. Lastly, this website is important as it provides some basic information very easilythat every individual needs.

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