

ABSTRACT

We found that the temperature, humidity has vital relation with rainfall. Mechanism we are providing is similar to classification in data marts for analysis of rainfall. This mechanism uses data of 10 years.

We are taking temperature, humidity as the attributes for prediction. This mechanism analyses the number of tuples with heavy, moderate, low rainfall at a selected range of temperature. On this basis it calculates the probability of heavy, moderate, low rainfall the given range of temperature.

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1. INTRODUCTION

Rainfall is the most important climate variable that affects the crops in the tropical rain fed regions. People wish to know whether there would be rainfall in the coming months or year. To fulfill this requirement, one needs a forecast, well ahead of the commencement of the crop season. Such rainfall forecast can be used both by the farmers and the government in planning for the ensuring year. This work is an attempt to analyze the available data for development of a system for rainfall forecast and crop selection.

Some intelligent prediction of rain is essential for all agricultural activities. Mostly the farmers do it based on their understanding and observation on nature. An intelligent support system can be attempted by using database on the weather information available. Predictive models can be made in support of the farmers and make it available whenever they are in need.

1.1 SCOPE

Prediction of rain is designed for all Agricultural activities. People wish to know whether there would be rainfall in the coming months or year. To fulfill this requirement, rainfall forecast can be used both by the farmers and the government in planning for the ensuring year. This provides accurate rainfall estimation . The prediction result will be given based on the available 10 year of rainfall data. Ensures accurate seasonal and yearly rainfall estimation .This is not only useful for forecasting, but also for analytical comparison with the past data.

1.2 EXISTING SYSTEM V/S PROPOSED SYSTEM

Although we have many efficient mechanisms, people with no or less knowledge on prediction analysis may find this simple mechanism interesting and easy.

We found that the temperature, humidity has vital relation with the rainfall. Mechanism we are providing is similar to classification in data marts for analysis of rainfall .This mechanism uses data of

10 years. As this uses 10 years of data. This system is not only useful for forecasting , but also for analytical comparison with the past data. proposed system is much better than the existing system as it has following advantages:

- Increased efficiency
- Allows neat handling of data rather than error prone records.
- Decreases overhead
- Accurate

2.TECHNOLOGIES USED

We used PHP as Programming language for writing the code for the project as, PHP is a server scripting language, and a powerful tool for making dynamic and interactive Web pages.

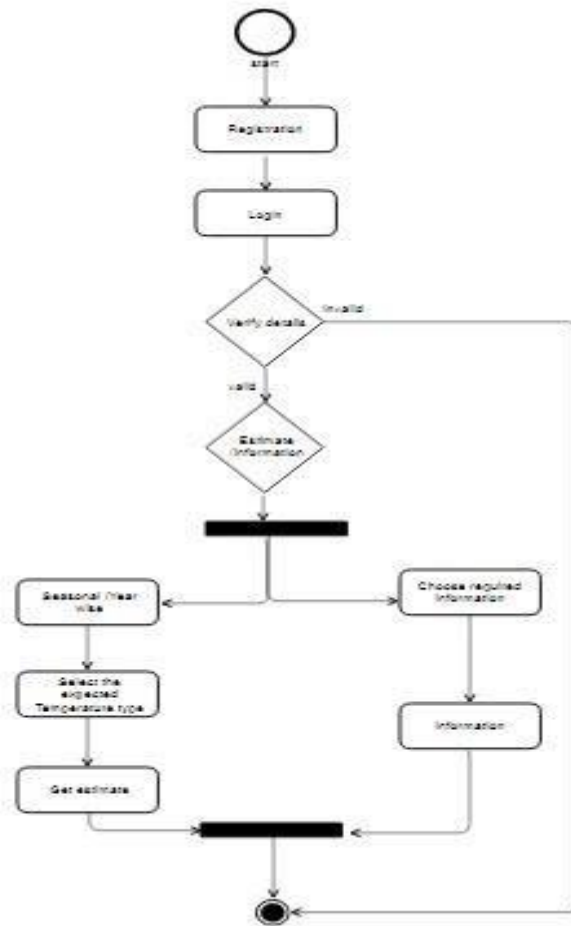
PHP is a widely-used, free, and efficient alternative to competitors such as Microsoft's ASP.

Software Requirements

- Client-side Technologies : Html, JavaScript, CSS, Bootstrap
- Server-side Technologies : PHP
- Database: Oracle 10g
- Operating System : Windows 10
- Software's : Wamp Server

3.DESIGN

3.1 ACTIVITY DIAGRAM:



The above diagram shows us the activity flow of our project Prediction of Rain .The user has to register with his/her personal details and then login through the website and verify the details. After the validation process, he gets to login to the website, then user can select estimation or information. While estimation is selected by the user, required seasonal or yearly estimation must be selected . After selecting seasonal or yearly estimation , temperature type should be selected and accurate rainfall estimation can be acquired .if information is selected by the user , required information can be gained by the user.

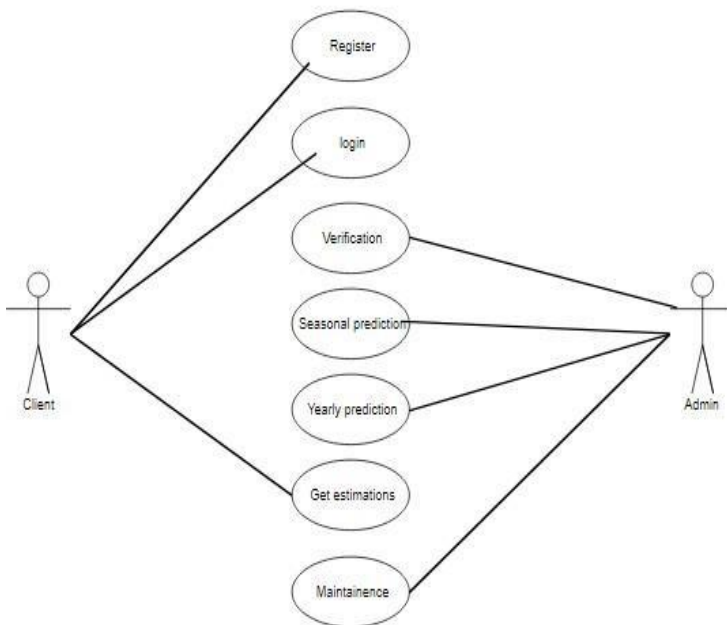
3.2 ACTORS

We have two Actors involved in this

□ Admin □

Client

ACTOR	DESCRIPTION
Administrator	1.Verification 2.Seasonal prediction 3.yearly prediction 4.maintenance
User	1. Registration 2. Login 3. Get estimation



3.3 MODULES:

- User Module
- Admin Module

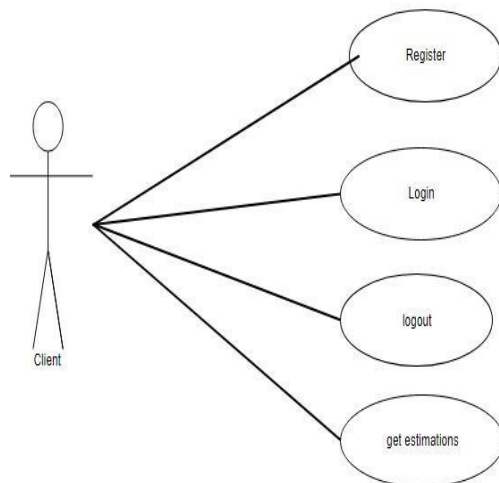
3.3.1 USER MODULE:

The client will register with their details like username, email, password, confirm password. The client registered details will be recorded. Once he/she finishes with the registration then he/she can log into the website .Then enter the required year to get accurate rainfall data for that year entered based on the available rainfall data.

Client functionalities:

- 1) Registration
- 2) login
- 3) Get estimations

Use case diagram for user:



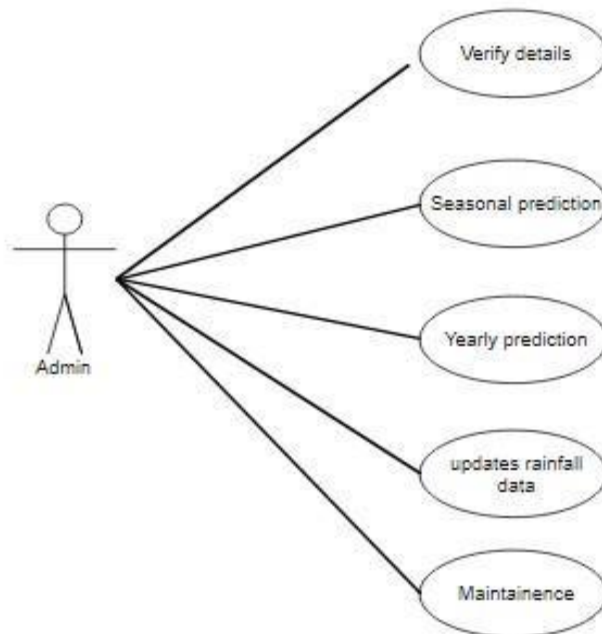
3.3.2 ADMIN MODULE :

The admin checks in the Validation process. The client is allowed to get required rainfall estimation only if the validation is successful. The administrator module having all the privileges about this website. He can update, predict and displays the estimations.

Admin functionalities :

1. Verify details
2. Seasonal prediction
3. Yearly prediction
4. Maintenance

Use case diagram for admin:



4.IMPLEMENTATION

4.1 Source code structure:

4.1.1 Folders:

- **Assets**
- **CSS**
- **Images**
- **js**

i. assets:

It is the folder which contains all the source files. **ii.**

CSS:

It is the folder that contains all the “.css” files that are created to provide styling to the website.

iii. Images:

It contains all the images that are used while coding the website. **iv.**

JS:

It contains all the java script files.

4.1.2 PROGRAM FILES:

We have following programming files in our project

ADMIN

- 1.enterbackend.php
- 2.enterbackendstate.php

CLIENT

1. registration_process.php
2. login.php
- 3.main.php
- 4.n.php

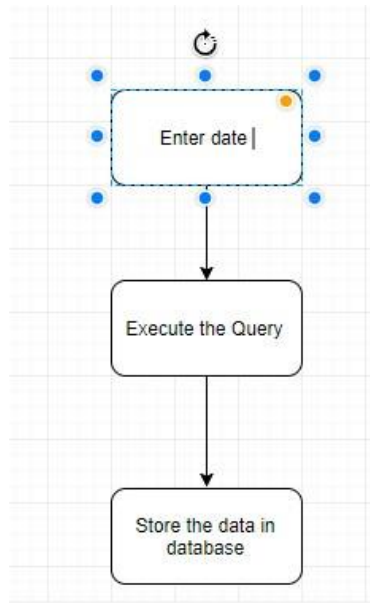
4.1.3 FUNCTIONS ,PARAMETERS,FLOWCHART OF EACH PROGRAM FILES:

ADMIN

ENTERBACKEND.PHP:

Enterbackend.php is used to store national wise data. Whenever client needs national wise rainfall data , based on this data prediction is done and displayed to the client.

User Manual : Enter data → Execute the query → Stores the data in database.

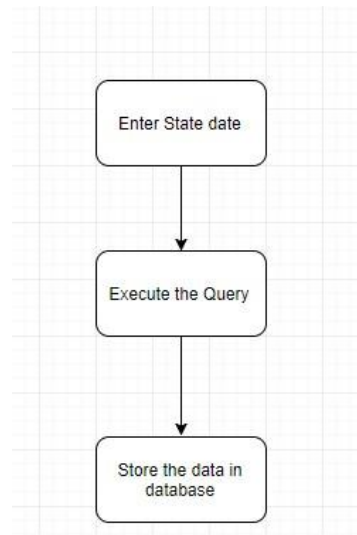


```
1 <?php
2
3 $y=intval($_GET['year']);
4 $q1=intval($_GET['a']);
5 $q2=intval($_GET['b']);
6 $q3=intval($_GET['c']);
7 $q4=intval($_GET['d']);
8 $ann=intval($_GET['ann']);
9 $temp=intval($_GET['temp']);
10
11 $con = mysqli_connect("localhost","root","","a");
12 if ($con)
13 $sql="insert into rainfall values ('$y','$ann','$q1','$q2','$q3','$q4','$temp)' " ;
14 $con->query($sql);
15 header('Location: http://localhost/project/nationalupdate.html');
16
17 ?>
```

ENTERBACKENDSTATE.PHP:

Enterbackendstate.php is used to store state wise data. Whenever client needs national wise rainfall data , based on this data prediction is done and displayed to the client.

User Manual : Enter state data → Execute the query → Stores the data in database.



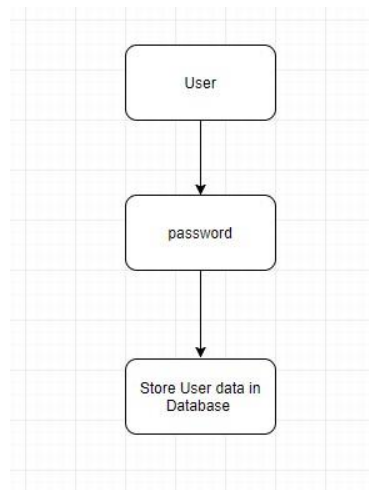
```
1 <?php
2 $s=intval($_GET['state']);
3 $ann=intval($_GET['ann']);
4 $tem=intval($_GET['temp']);
5 $q1=intval($_GET['a']);
6 $q2=intval($_GET['b']);
7 $q3=intval($_GET['c']);
8 $q4=intval($_GET['d']);
9
10 $con = mysqli_connect("localhost","root","","a");
11 if ($con)
12 {
13     if($s==0)
14     $state='AN';
15     else if($s==1)
16     $state='A&N';
17     else if($s==16)
18     $state='AP';
19     else if($s==2)
20     $state='BIHAR';
21     else if($s==3)
22     $state='CHANDIGARH';
23     else if($s==4)
24     $state='CHATTISCHAR';
25     else if($s==5)
26     $state='DELHI';
27     else if($s==6)
28     $state='GOA';
29     else if($s==7)
30     $state='HARYANA';
31     else if($s==8)
32     $state='JK';
33     else if($s==9)
34     $state='PANJAB';
35     else if($s==10)
36     $state='MAHARASTRA';
```

CLIENT

REGISTRATION_PROCESS.PHP:

Registration_process.php script is used for relinquishing details from the user. This file makes the user to register. They are asked to provide some sort of credentials (such as a username,e-mail address, password.) to the system in order to prove their identity: this is known as logging in. So, hereby we have used the same parameters for our registration page providing username, e-mail address. Once they get registered then he can click on the submit button which is provided below and can wait for the validation .In the validation the details entered or given by the user is deeply checked and corrected. If in case he has entered wrong credentials then an alert will be provided for the user to re check the details and register correctly. Once the user is done with the registration then he is moved onto login page.

User Manual : User provides all the details and clicks \longrightarrow Register \longrightarrow Store user data in database.



```

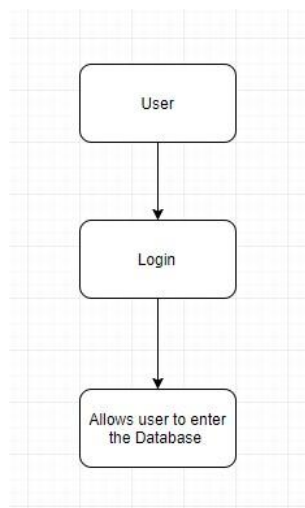
<code>
</code>

```

LOGIN_PROCESS.PHP:

Login_process.php is used for setting up the process by which the individual gains access to our provided website by identifying and authenticating themselves. The user credentials are some form of username and password. The login.php sets us the functionality of setting the exam paper and once we get logged into the exam, Its main function is to check whether the answers given by the user is correct or not and the user will receive alert messages which contain the security questions in which the user will be asked questions based on the information he has provided, once if he is answerable to the questions then he may proceed for the exam or else his exam will get aborted.

User Manual: User enter the email id and password → Login → Allow user to enter the database.



```

<?php
$con = mysqli_connect('localhost','root','','a');

$username = $_REQUEST['username'];
$password = $_REQUEST['password'];

if($con)
{
    if(isset($username) && isset($password))
    {
        $query = "select username,password from users where username='$username' and password = '$password'";
        $result = mysqli_query($con,$query);
        if(mysqli_num_rows($result) == 1)
        {
            header("Location: http://localhost/project/update.html");
        }
        else
        {
            header("Location: http://localhost/project/error.html");
        }
    }
}
else
{
    echo "Come back later";
}
}
  
```

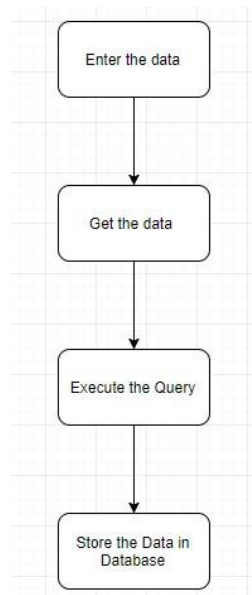
NATIONAL.PHP:

National.php is used to get national wise accurate rainfall estimation for the year entered. This national wise rainfall data is stored in the enterbackend.php. Whenever client needs national wise rainfall data, based on this data prediction is done and displayed to the client.

Estimate()- parameters NULL

GroupBarPlot()- parameters : x-attribute

User Manual: Admin enter data → get the data → Execute the query → Store data in database.



```

<?php
$temp=intval($_GET['tem']);
$sea=intval($_GET['season']);
$i=0;
$a=0;
$b=0;
$c=0;

$con = mysqli_connect("localhost","root","","a");

if($sea==0)
{
    $sql = "select ann,temp from rainfall";
    $result = $con->query($sql);
    if($result->num_rows > 0)
    {
        while($row = $result->fetch_assoc())
        {
            $ann=$row['ann'];
            $tem=$row['temp'];
            if (($temp<=$tem) && ($temp>0>$tem))
            {
                $i++;
                if ($ann<1100)
                {
                    $a++;
                    if ($ann>1100 && $ann<1200)
                    {
                        $b++;
                        if ($ann>1200)
                        {
                            $c++;
                        }
                    }
                }
            }
        }
    }
}
  
```

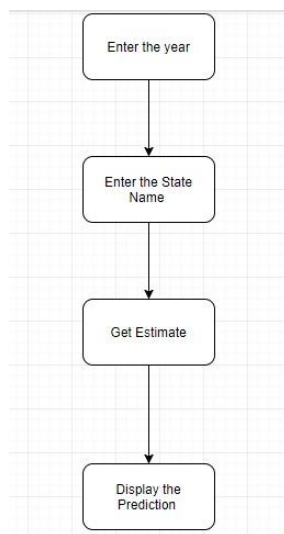
STATE.PHP:

State.php is used to get can get state wise accurate rainfall estimation for the year entered. . This state wise rainfall data is stored in the enterbackendstate.php. Whenever client needs state wise rainfall data ,based on this data prediction is done and displayed to the client.

Estimate()- parameters NULL

GroupBarPlot()- parameters : x-attribute

User Manual: Enter the year → Enter the status name → Get estimate → Display the prediction.



```

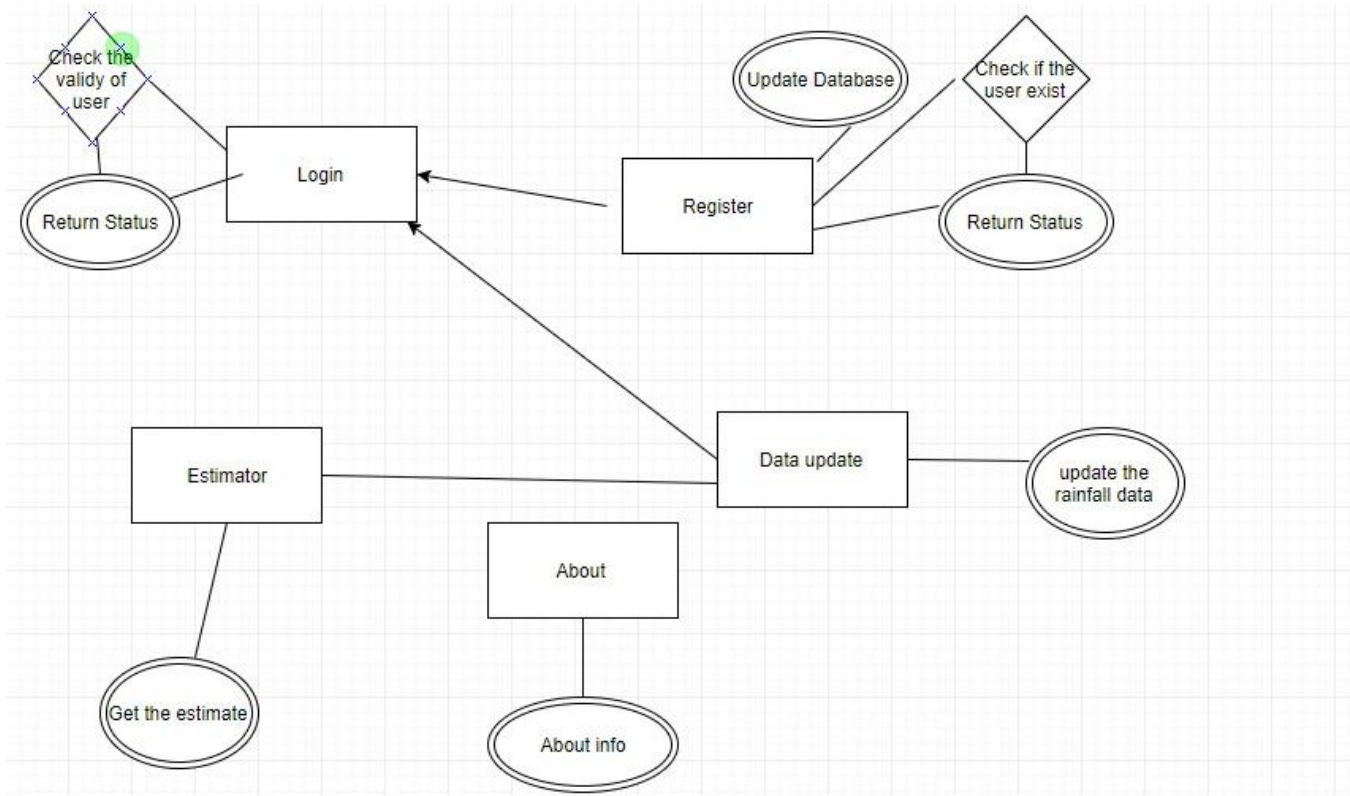
<?php
$temp=intval($_GET['tem']);
$sea=intval($_GET['season']);
$s=intval($_GET['state']);

$i=0;
$a=0;
$b=0;
$c=0;
$d=0;
$e=0;
$f=0;

$con = mysqli_connect("localhost","root","","a");

if($s==0)
  $state='AN';
else if($s==1)
  $state='AGN';
else if($s==16)
  $state='AP';
else if($s==2)
  $state='BIHAR';
else if($s==3)
  $state='AS';
else if($s==4)
  $state='CHHATTISGHAR';
else if($s==5)
  $state='DELHI';
else if($s==6)
  
```

5.DATABASE DESIGN



6.TEST

CASES

Test cases id	Test case name	Operation performed	Input	output	status
1	Registration	Details are stored in the database	Provide details	Registration successful	successful
2	login	Verification is performed	Enter username and password	proceed	successful
3	National estimation	Verify details	Enter required year	Display prediction result	Successful
4	State estimation	Verify details	Select state and enter year	Display prediction result	Successful

7.DEPLOYMENT

Deployment diagrams are a set of nodes and their relationships. These nodes are physical entities where the components are deployed. Deployment diagrams are used for visualizing deployment view of a system. This is generally by the deployment team. Deployment diagrams are used for describing the hardware components where software components are deployed. Deployment diagrams are used by the system engineers.

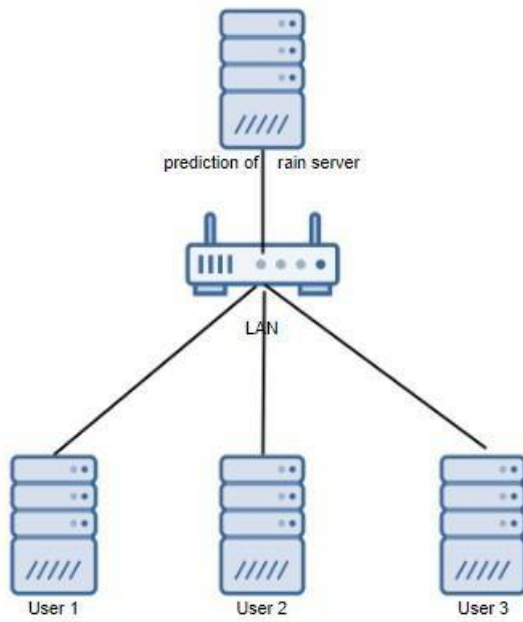
The purpose of deployment diagram can be described as:

- Visualize hardware topology of a system.
- Describe runtime components used to deploy software components.
- Describe runtime processing nodes.

Deployment diagrams also controls the following parameters

- Performance
- Scalability
- Maintainability
- Portability

DEPLOYMENT DIAGRAM:



8.SCREEN SHOTS

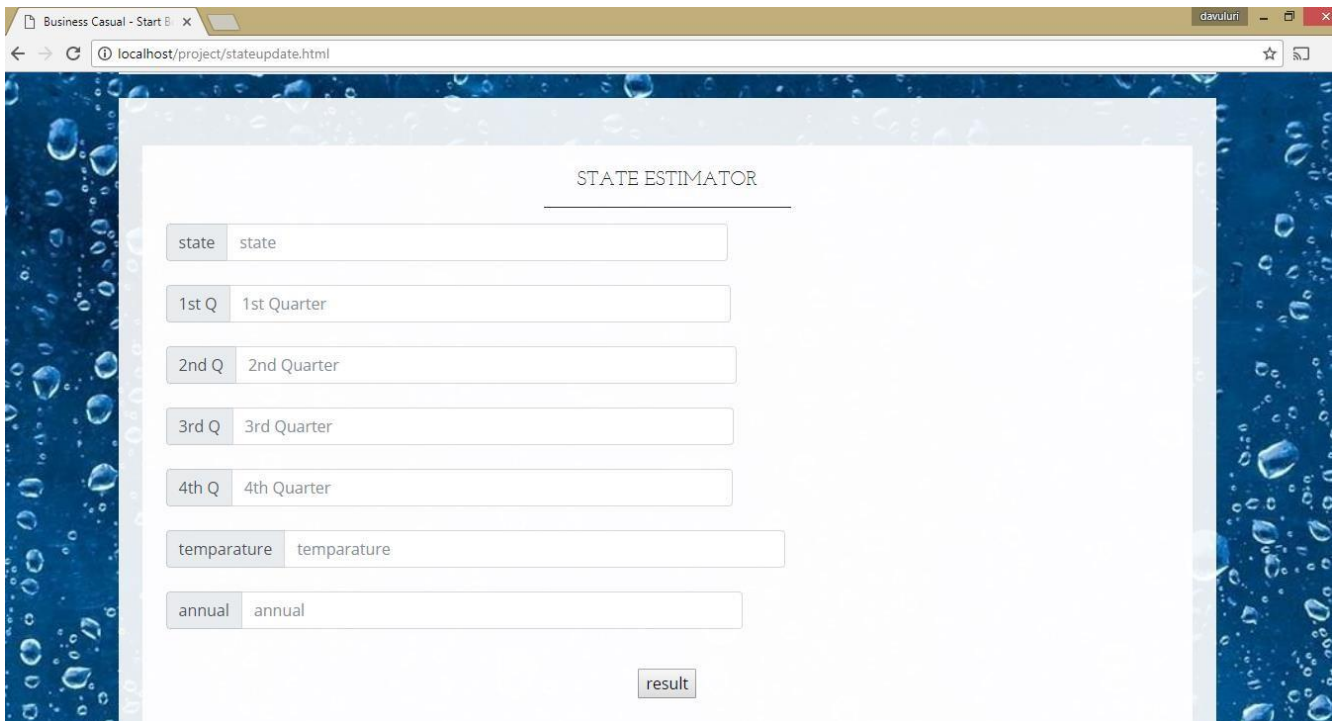
ENTER NATIONAL DATA:

The image shows a web form titled "NATIONAL ESTIMATOR" with a decorative border of blue water droplets. The form contains several input fields:

- A "WELCOME" header at the top.
- A "NATIONAL ESTIMATOR" title.
- Input fields for "year", "1st Q", "2nd Q", "3rd Q", "4th Q", "temparature", and "annual".

National Estimator of the website allow admin to enter the rainfall data and perform query execution and stores in the database.

ENTER STATE DATA:



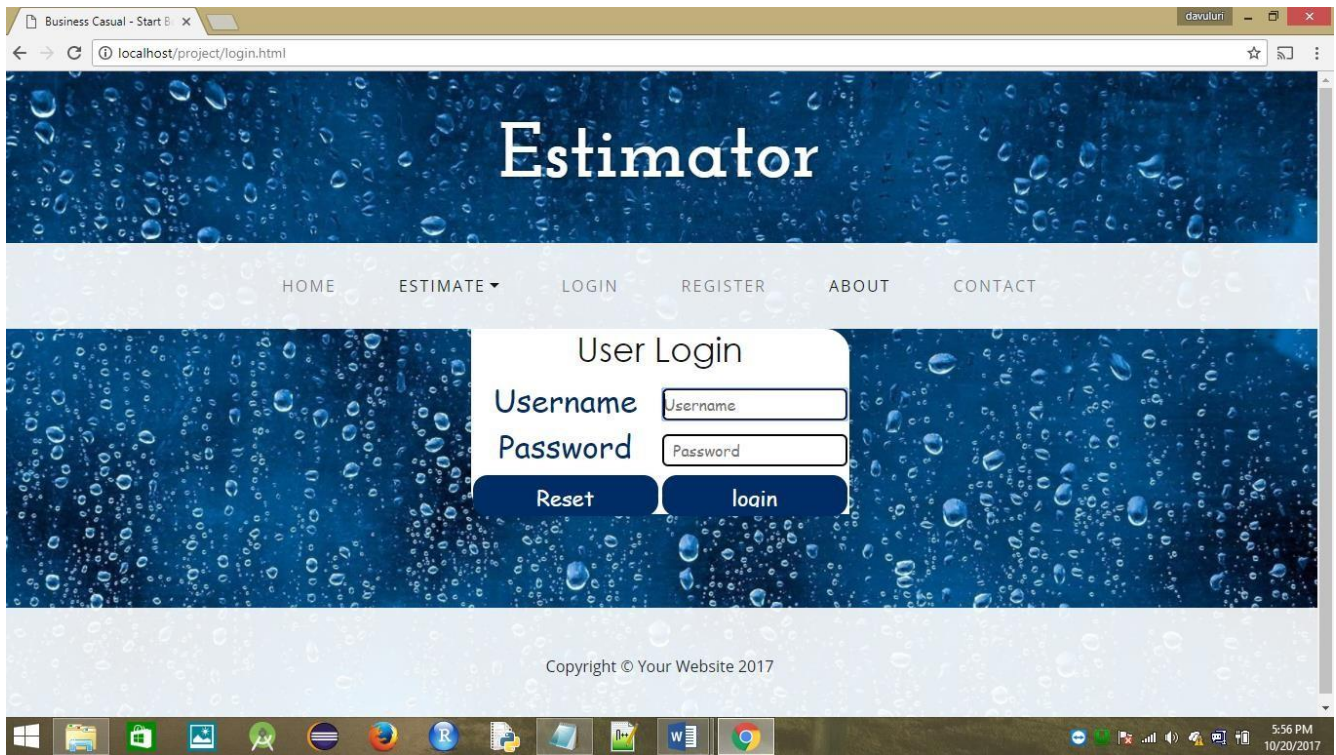
State Estimator of the website allow admin to enter the rainfall data and perform query execution and stores in the database.

REGISTER:



The register of the website allows user to register by giving his/her credentials like his username, email id and password.

LOGIN:



The login of the website allows user to login if he/she have registered and also allows to register otherwise.

NATIONAL ESTIMATOR:



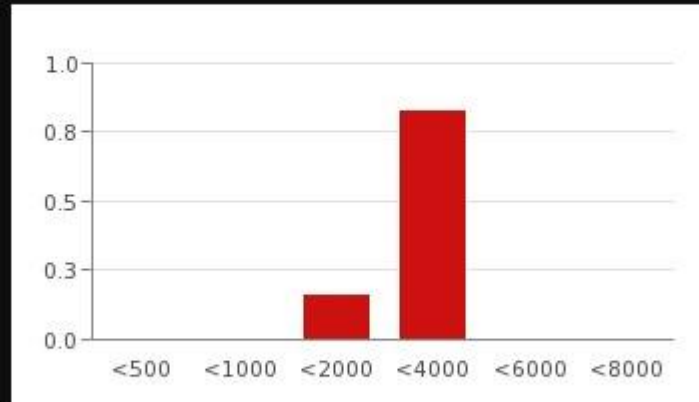
The National Estimate of the website allows user to get estimations of national wise rainfall by entering required year .

STATE ESTIMATOR:



The State Estimator of the website allows user to get estimations of State wise rainfall by selecting required state and entering required year.

STATE GRAPH:



The result of every rainfall prediction is shown in the above graphical representation .

9.CONCLUSION AND FURTHER ENHANCEMENTS

User has to register for the accurate rainfall prediction with providing details such as username, password, email address. After the registration user has to login to the website where verification is performed whether he/she is a valid user or not. Once user logs in user can acquire the required estimation or

information . While estimation is selected by the user, required seasonal or year wise estimation must be selected . After selecting seasonal or year wise estimation , temperature type should be selected and accurate rainfall estimation can be acquired .if information is selected by the user , required information can be gained by the user. This system is not only useful for forecasting , but also for analytical comparison with the past data.

