CSE 6332-002 Cloud Computing & Big Data

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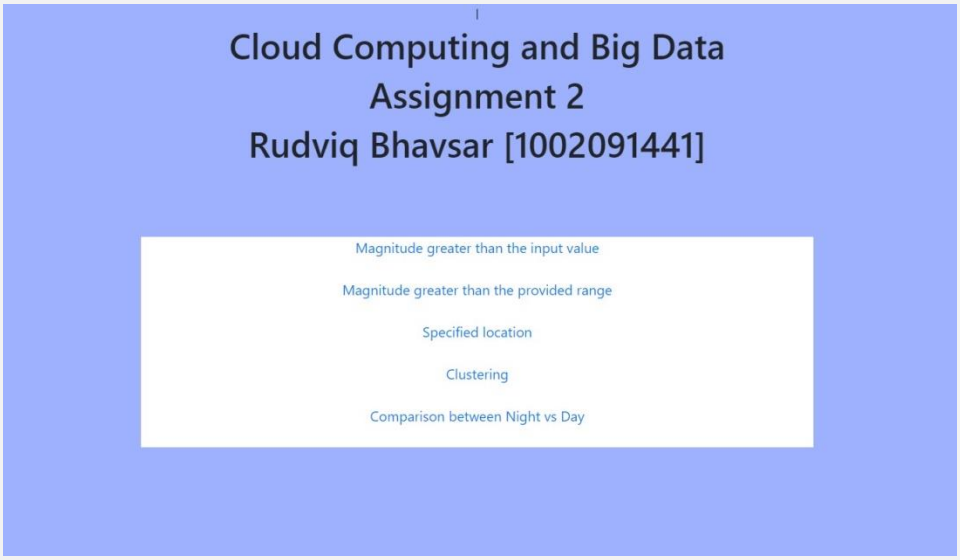
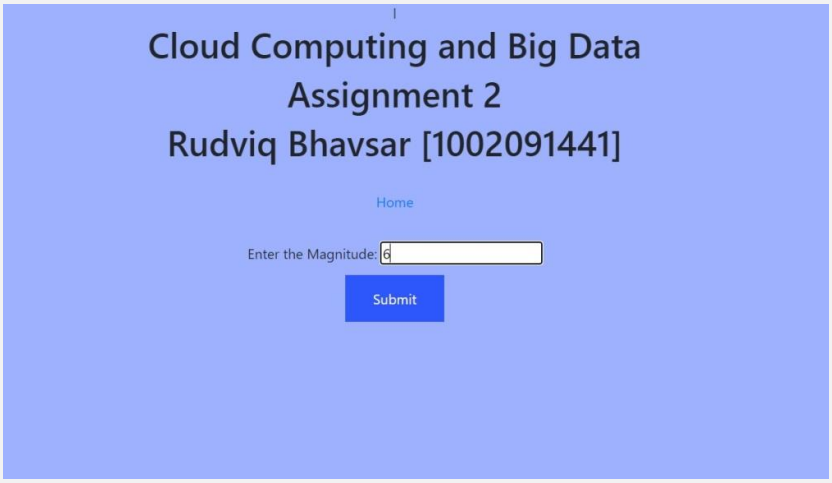
Assignment 2

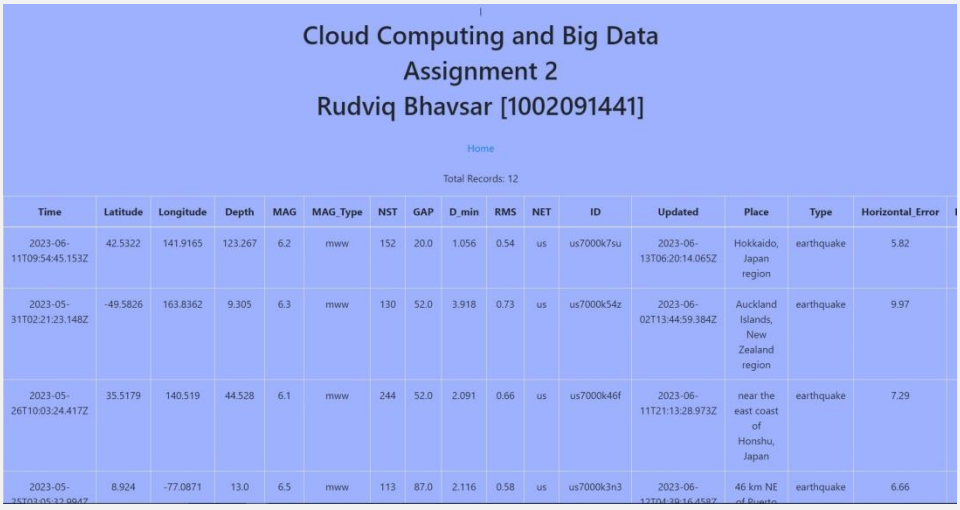
CODE SNIPPETS-

1) Home page



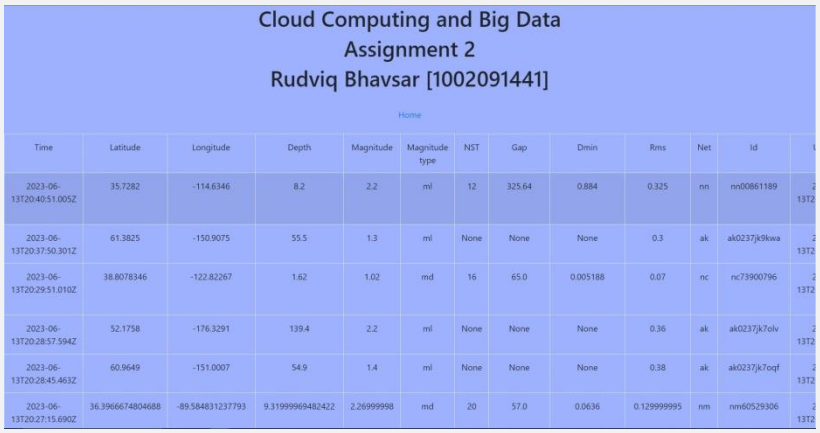
2) Page to display magnitude greater than 5



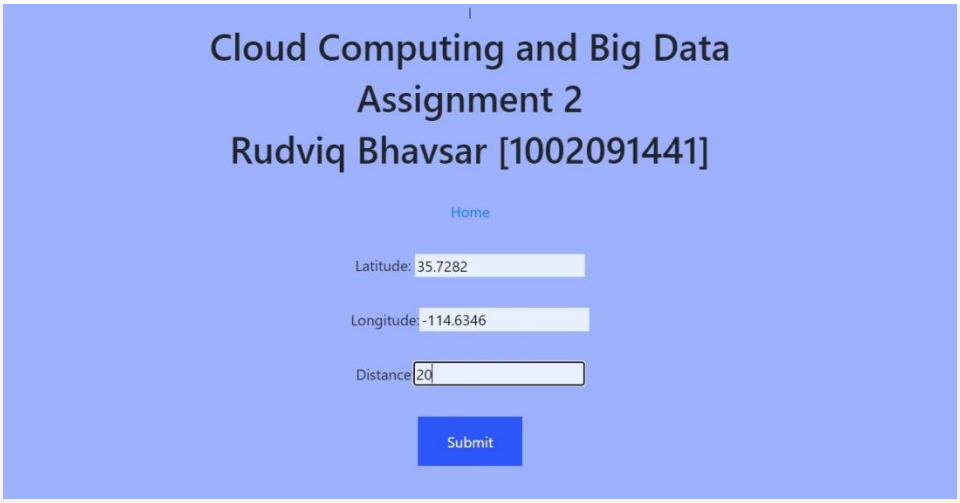


Time	Latitude	Longitude	Depth	MAG	MAG_Type	NST	GAP	D_min	RMS	NET	ID	Updated	Place	Type	Horizontal_Error
2023-06-11T09:54:45.153Z	42.5322	141.9165	123.267	6.2	mww	152	20.0	1.056	0.54	us	us7000k7su	2023-06-13T06:20:14.065Z	Hokkaido, Japan region	earthquake	5.82
2023-05-31T02:21:23.148Z	-49.5826	163.8362	9.305	6.3	mww	130	52.0	3.918	0.73	us	us7000k54z	2023-06-02T13:44:59.384Z	Auckland Islands, New Zealand region	earthquake	9.97
2023-05-26T10:03:24.417Z	35.5179	140.519	44.528	6.1	mww	244	52.0	2.091	0.66	us	us7000k46f	2023-06-11T21:13:28.973Z	near the east coast of Honshu, Japan	earthquake	7.29
2023-05-25T03:05:32.894Z	8.924	-77.0871	13.0	6.5	mww	113	87.0	2.116	0.58	us	us7000k3n3	2023-06-12T04:39:16.458Z	46 km NE of Puerto	earthquake	6.66

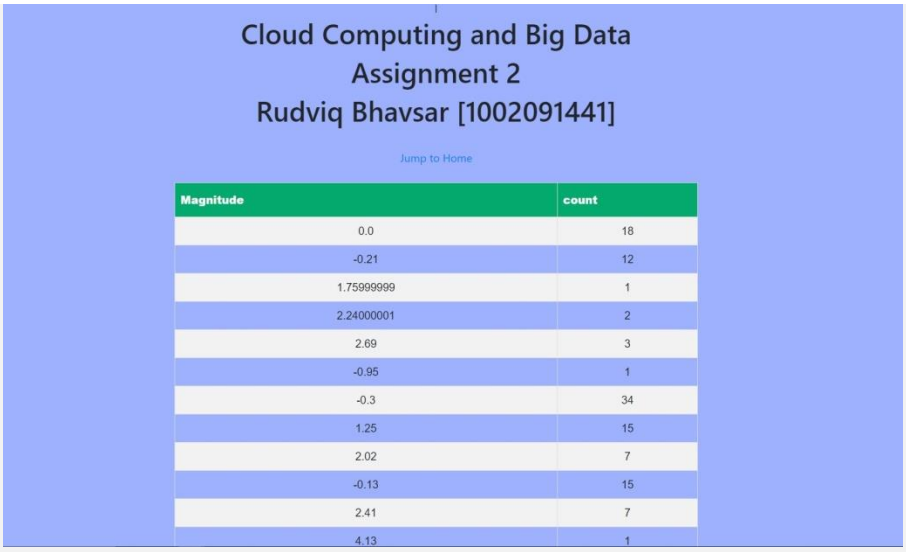
3) Display magnitude between the given range



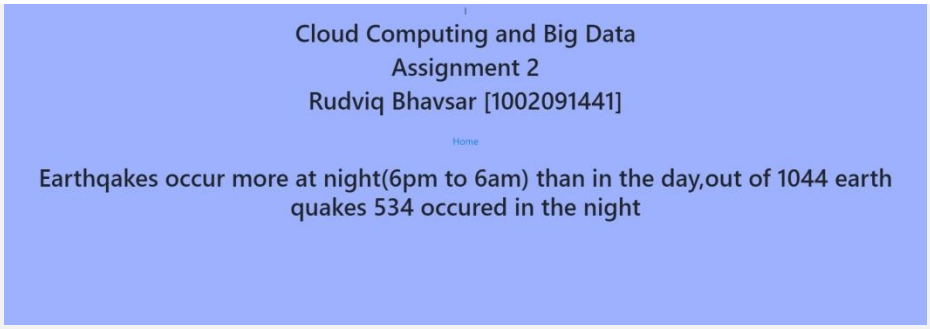
4) Display the specified range using latitude, longitude and the distance



5) Clustering



6) Comparison between night and day data



Source Code –

1) Python file source code

```
from math import radians,sin,cos,asin,sqrt
from datetime import date, datetime, timedelta
from flask import Flask, render_template, request
import pyodbc
from flask_wtf import FlaskForm
from wtforms import StringField, SubmitField
from wtforms.validators import DataRequired

app = Flask(__name__)
app.config['SECRET_KEY'] = 'rudviqb'


driver = '{ODBC Driver 18 for SQL Server}'
database = 'Database02'
server = 'tcp:rb0212.database.windows.net,1433'
username = "rsb1441"
password = "Rb#azure02"



with pyodbc.connect(
'DRIVER=' + driver + ';SERVER=' + server + ';PORT=1433;DATABASE=' + database + ';UID=' +
username + ';PWD=' + password) as conn:
with conn.cursor() as cursor:
temp = []
cursor.execute("SELECT TOP 3 time, id FROM earthquake")
while True:
r = cursor.fetchone()
if not r:
break
print(str(r[0]) + " " + str(r[1]))
temp.append(r)


@app.route("/", methods=['GET', 'POST'])
def toHome():
return render_template('homePage.html')
```

```
class showMag(FlaskForm):
mag = StringField(label='Enter the Magnitude: ', validators=[DataRequired()])
submit = SubmitField(label='Submit')


@app.route('/magcount', methods=['GET', 'POST'])
def magcount():
form = showMag()
cnt = 0
if form.validate_on_submit():
try:
magcount = float(form.mag.data)
if magcount <= 5.0:
return render_template('displayMag.html', form=form, error="value must be > 5.0", temp=1)
cursor.execute("SELECT * FROM earthquake where mag > ?", magcount)
output = []
while True:
row = cursor.fetchone()
if not row:
break
output.append(row)
cnt += 1
return render_template('displayMag.html', output=output, cnt=cnt, temp=0)
except ValueError:
return render_template('displayMag.html', form=form, error="value must be numeric.",
temp=1)
return render_template('displayMag.html', form=form, temp=1)

def distance(lat1, lat2, lon1, lon2):
lon1 = radians(lon1)
lon2 = radians(lon2)
lat1 = radians(lat1)
lat2 = radians(lat2)
# Haversine formula
dlon = lon2 - lon1
dlat = lat2 - lat1
a = sin(dlat / 2)**2 + cos(lat1) * cos(lat2) * sin(dlon / 2)**2
c = 2 * asin(sqrt(a))
# Radius of earth in kilometers. Use 3956 for miles
r = 6371
# calculate the result
return(c * r)

@app.route('/specLoc',methods=['POST','GET'])
def lsearch():
```

```
if request.method =='POST':
lat1=request.form['lat1']
lon1=request.form['lon1']
km=request.form['kms']
querry="Select id,time,latitude,longitude,mag,place from earthquake"
cursor.execute(querry)
lat1=float(lat1)
lon1=float(lon1)
km=float(km)
rows = cursor.fetchall()
bkm=[]
for i in rows:
x=distance(lat1,float(i[2]),lon1,float(i[3]))
if x<=km:
bkm.append(i)
return render_template("specLoc.html",rows = bkm)
else:
return render_template('specLoc.html')

@app.route('/magRange', methods = ['GET','POST'])
def magRange():
if request.method =='POST':
Range1 = str(request.form['Range1'])
Range2 = str(request.form['Range2'])
Fromdate = request.form['Fromdate']
Todate = request.form['Todate']
query = "SELECT * FROM dbo.earthquake where (mag BETWEEN '"+Range1+"' and '"+Range2+"')
and (CAST(time as date) BETWEEN CAST('"+Fromdate+"' as date) and CAST('"+Todate+"' as
date)) "
cursor.execute(query)
results = cursor.fetchall()
return render_template("magRange.html", length = len(results), rows = results,temp=0)
else:
return render_template("magRange.html",temp=1)


@app.route("/clust", methods=['GET', 'POST'])
def cluster():
count =0
query=("SELECT mag,COUNT(*) FROM earthquake  group by mag")
cursor.execute(query)
result=cursor.fetchall()
return render_template("cluster.html",msg="completed", rows=result)

@app.route('/nightNDay',methods=['POST','GET'])
```

```
def nightdata():
count=0
time1 = "06:00:00.0000000 +00:00"
time2 = "18:00:00.0000000 +00:00"
query = "SELECT place, CAST(time as time) FROM dbo.earthquake where mag > 4.0 and
(CAST(time as time) not BETWEEN CAST('"+time1+"' as time) and CAST('"+time2+"' as time)) "
cursor.execute(query)
result = cursor.fetchall()
count1 = len(result)
query1 = "SELECT place, CAST(time as time) FROM dbo.earthquake where mag > 4.0"
cursor.execute(query1)
result1 = cursor.fetchall()
count2 = len(result1)

if(count1>(count2-count1)):
display="Earthqakes occur more at night(6pm to 6am) than in the day,out of "+str(count2)+"
earth quakes "+str(count1)+" occured in the night"
else:
display="Earthqakes occur more at day(6am to 6pm) than in the night,out of "+str(count2)+"
earth quakes "+str(count2-count1)+" occured in the day time"
return render_template("newrecord.html",display = display)

if __name__ == '__main__':
app.run(debug=True)
```

2) Main page -> homepage.html

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
  <style>
    h1{text-align: center;}
    div{text-align: center;
        background-color: white;
        width:50%;
        margin: auto;
        margin-top: 50px;}
    body{text-align: center;}
```

```
  </style>
</head>
l<body style="background-color:#9eb1ff;">
  <h1> Cloud Computing and Big Data</h1>
  <h1>Assignment 2 </h1>
  <h1 >Rudviq Bhavsar [1002091441] </h1>
   <br>
    <div>
          <!-- <a href="/">Homepage</a><br><br> -->
          <a href="/magcount">Magnitude greater than the input value</a><br><br>
          <a href="/magRange">Magnitude greater than the provided range</a><br><br>
          <a href="/specLoc">Specified location</a><br><br>
          <a href="/clust">Clustering</a><br><br>
          <a href="/nightNDay">Comparison between Night vs Day</a><br><br>
    </div>
</body>
</html>
```

3) Display magnitude greater than the input value -> displayMag.html

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
  <style>
    h1{text-align: center;}
    div{text-align: center;}
    body{text-align: center;}
    form,input[type="text"]{margin-bottom: 5px;
                    font-size: 16px;
                     margin-top: 5px;
                     border: none;
                     height:25px;}
        input[type="submit"]{background-color:#2e57fb;
                             border: none;
                             color: white;
                             padding: 15px 32px;
                             text-align: center;
                             text-decoration: none;
                             display: inline-block;
```

```
                            font-size: 16px;
                            margin-top: 5px;}
  </style>
</head>
l<body style="background-color:#9eb1ff;">
    <h1> Cloud Computing and Big Data</h1>
    <h1>Assignment 2 </h1>
    <h1 >Rudviq Bhavsar [1002091441] </h1>
     <br>
  <div>
    <a href="/">Home</a><br><br>
  </div>
{% if error %}
    <p class="">{{ error }}</p>
{% endif %}
{% if temp == 1 %}
    <div class="form-group">
        <form action="/magcount" method="POST">
            {{ form.csrf_token() }}
            {{ form.mag.label }} {{ form.mag }}<br/>
            {{ form.submit }}
        </form>
    </div>
{% endif %}
{% if temp == 0 %}
    <p class="">Total Records: {{ cnt }}</p>

    <div class="table-responsive">
    <table class="table table-bordered table-hover table-fixed table-wrap">
        <caption>Earthquake Records</caption>
        <thead>
            <tr>
                <th scope="col">Time</th>
                <th scope="col">Latitude</th>
                <th scope="col">Longitude</th>
                <th scope="col">Depth</th>
                <th scope="col">MAG</th>
                <th scope="col">MAG_Type</th>
                <th scope="col">NST</th>
                <th scope="col">GAP</th>
                <th scope="col">D_min</th>
                <th scope="col">RMS</th>
                <th scope="col">NET</th>
                <th scope="col">ID</th>
                <th scope="col">Updated</th>
```

```
                <th scope="col">Place</th>
                <th scope="col">Type</th>
                <th scope="col">Horizontal_Error</th>
                <th scope="col">Depth_Error</th>
                <th scope="col">MAG_Error</th>
                <th scope="col">MAG_NST</th>
                <th scope="col">Status</th>
                <th scope="col">Location_Source</th>
                <th scope="col">MAG_Source</th>
            </tr>
        </thead>
        <tbody>
            {% for row in output %}
                <tr>
                    <td>{{ row[0] }}</td>
                    <td>{{ row[1] }}</td>
                    <td>{{ row[2] }}</td>
                    <td>{{ row[3] }}</td>
                    <td>{{ row[4] }}</td>
                    <td>{{ row[5] }}</td>
                    <td>{{ row[6] }}</td>
                    <td>{{ row[7] }}</td>
                    <td>{{ row[8] }}</td>
                    <td>{{ row[9] }}</td>
                    <td>{{ row[10] }}</td>
                    <td>{{ row[11] }}</td>
                    <td>{{ row[12] }}</td>
                    <td>{{ row[13] }}</td>
                    <td>{{ row[14] }}</td>
                    <td>{{ row[15] }}</td>
                    <td>{{ row[16] }}</td>
                    <td>{{ row[17] }}</td>
                    <td>{{ row[18] }}</td>
                    <td>{{ row[19] }}</td>
                    <td>{{ row[20] }}</td>
                    <td>{{ row[21] }}</td>
                </tr>
            {% endfor %}
        </tbody>
    </table>
</div>
{% endif %}
</body>
</html>
```

4) Display Magnitude greater than the given range -> magRange.html

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
  <style>
    h1{text-align: center;}
    div{text-align: center;}
    body{text-align: center;}
    form,input[type="text"]{margin-bottom: 5px;
                    font-size: 16px;
                     margin-top: 5px;
                     border: none;
                     height:25px;}
        input[type="submit"]{background-color:#2e57fb;
                             border: none;
                             color: white;
                             padding: 15px 32px;
                             text-align: center;
                             text-decoration: none;
                             display: inline-block;
                             font-size: 16px;
                             margin-top: 5px;}

  </style>
</head>
<body style="background-color:#9eb1ff;">
  <h1> Cloud Computing and Big Data</h1>
  <h1>Assignment 2 </h1>
  <h1 >Rudviq Bhavsar [1002091441] </h1>
   <br>

    <div>
          <a href="/">Home</a><br><br>

{% if temp == 1 %}
<form action="/magRange" method="POST">
    Range1: <input type="text" placeholder="Range1" name="Range1" value="{{ Range1 }}">
<br/><br/>
```

```
    Range2:<input type="text" placeholder="Range2" name="Range2" value="{{ Range2
}}"><br/><br/>
    From Date:<input type="date" name="Fromdate" value="{{ Fromdate }}"><br/><br/>
    to Date:<input type="date" name="Todate" value="{{ Todate }}"><br><br>

    <input type="submit" value="Submit">
</form>
{% endif %}
</div>


{% if temp == 0 %}
<div class="table-responsive">
{% if length %}
    <table class="table table-bordered table-hover table-fixed table-wrap">
        <tr>
            <td>Time</td>
            <td>Latitude</td>
            <td>Longitude</td>
            <td>Depth</td>
            <td>Magnitude</td>
            <td>Magnitude type</td>
            <td>NST</td>
            <td>Gap</td>
            <td>Dmin</td>
            <td>Rms</td>
            <td>Net</td>
            <td>Id</td>
            <td>Updated</td>
            <td>Place</td>
            <td>Type</td>
            <td>Horizontal_Error</td>
            <td>Depth_Error</td>
            <td>Mag_error</td>
            <td>Magnst</td>
            <td>Status</td>
            <td>Loc_source</td>
            <td>Mag_source</td>
        </tr>

        {% for col in rows %}
        <tr>
            <td>{{col[0]}}</td>
            <td>{{col[1]}}</td>
            <td>{{col[2]}}</td>
```

```
            <td>{{col[3]}}</td>
            <td>{{col[4]}}</td>
            <td>{{col[5]}}</td>
            <td>{{col[6]}}</td>
            <td>{{col[7]}}</td>
            <td>{{col[8]}}</td>
            <td>{{col[9]}}</td>
            <td>{{col[10]}}</td>
            <td>{{col[11]}}</td>
            <td>{{col[12]}}</td>
            <td>{{col[13]}}</td>
            <td>{{col[14]}}</td>
            <td>{{col[15]}}</td>
            <td>{{col[16]}}</td>
            <td>{{col[17]}}</td>
            <td>{{col[18]}}</td>
            <td>{{col[19]}}</td>
            <td>{{col[20]}}</td>
            <td>{{col[21]}}</td>

    </tr>

    {% endfor %}
{% endif %}
</table>
{% endif %}

</div>
</body>
</html>
```

5) Display specified location using latitude and longitude -> specLoc.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
</head>
```

```
  <style>
    h1{text-align: center;}
    div,form{text-align: center;}
    body{text-align: center;}
    form,input[type="text"]{margin-bottom: 5px;
           font-size: 16px;
          margin-top: 5px;
          border: none;
          height:25px;}
    input[type="submit"]{background-color:#2e57fb;
              border: none;
              color: white;
              padding: 15px 32px;
              text-align: center;
              text-decoration: none;
              display: inline-block;
              font-size: 16px;
              margin-top: 5px;}
    div[class="table-responsive"]{
      margin-top: 250px;
    }
</style>
l<body style="background-color:#9eb1ff;">
  <h1> Cloud Computing and Big Data</h1>
  <h1>Assignment 2 </h1>
  <h1 >Rudviq Bhavsar [1002091441] </h1>
   <br>
    <a href="/">Home</a><br><br>
    <form action="/specLoc" method="POST">
        Latitude: <input type="text" placeholder="Latitude" name="lat1" value="{{ lat1
}}"> <br/><br/>
        Longitude:<input type="text" placeholder="Longitude" name="lon1" value="{{ lon1
}}"><br/><br/>
        Distance:<input type="text" placeholder="in kms" name="kms" value="{{ km
}}"><br/><br/>
        <input type="submit" value="Submit">
    </form>
    </div>
    <div class="table-responsive">
    {% if rows %}
        <table class="table table-bordered table-hover table-fixed table-wrap">
            <tr>
                <td>Id</td>
                <td>Time</td>
                <td>Latitude</td>
```

```
                <td>Longitude</td>
                <td>Magnitude</td>
                <td>Place</td>
            </tr>

            {% for row in rows %}
            <tr>
                <td>{{row[0]}}</td>
                <td>{{row[1]}}</td>
                <td>{{row[2]}}</td>
                <td>{{row[3]}}</td>
                <td>{{row[4]}}</td>
                <td>{{row[5]}}</td>


        </tr>
          {% endfor %}
        {%endif%}
        </table>
    </div>
</body>
</html>
```

6) Clustering -> cluster.html

```
<!DOCTYPE html>
<html>

<head>
   <meta name="viewport" content="width=device-width, initial-scale=1">
   <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
   <style>
      h1{text-align: center;}
    div{text-align: center;}
    body{text-align: center;}
      #mgtab {
         font-family: Arial, Helvetica, sans-serif;
         border-collapse: collapse;
```

```
        width: 50%;
        margin: auto;
      }

      #mgtab td,
      #mgtab th {
        border: 1px solid #ddd;
        padding: 8px;
      }

      #mgtab tr:nth-child(even) {
        background-color: #f2f2f2;
      }

      #mgtab tr:hover {
        background-color: #ddd;
      }

      #mgtab th {
        padding-top: 12px;
        padding-bottom: 12px;
        text-align: left;
        background-color: #04AA6D;
        color: white;
      }

      form,input[type="text"]{margin-bottom: 5px;
               font-size: 16px;
               margin-top: 5px;
               border: none;
               height:25px;}
      input[type="submit"]{background-color:#2e57fb;
                     border: none;
                     color: white;
                     padding: 15px 32px;
                     text-align: center;
                     text-decoration: none;
                     display: inline-block;
                     font-size: 16px;
                     margin-top: 5px;}
   </style>
</head>

l<body style="background-color:#9eb1ff;">
   <h1> Cloud Computing and Big Data</h1>
```

```
   <h1>Assignment 2 </h1>
   <h1 >Rudviq Bhavsar [1002091441] </h1>
    <br>
      <div>
         <a href="/">Jump to Home</a><br><br>
      </div>
      <table id='mgtab'>
         <tr>
            <th><b>Magnitude</b></th>
            <th><b>count</b></th>
         </tr>
         {% for col in rows %}
         <tr>
            <td>{{col[0]}}</td>
            <td>{{col[1]}}</td>
         </tr>
         {% endfor %}
      </table>

      <br>

</body>

</html>
```

7) Comparison b/w night & day -> newrecord.html

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width, initial-scale=1">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/4.5.2/css/bootstrap.min.css">
  <style>
    h1{text-align: center;}
    div{text-align: center;}
    body{text-align: center;}
    form,input[type="text"]{margin-bottom: 5px;
           font-size: 16px;
          margin-top: 5px;
```

```
          border: none;
          height:25px;}
    input[type="submit"]{background-color:#2e57fb;
              border: none;
              color: white;
              padding: 15px 32px;
              text-align: center;
              text-decoration: none;
              display: inline-block;
              font-size: 16px;
              margin-top: 5px;}
  </style>
</head>
l<body style="background-color:#9eb1ff;">
  <h1> Cloud Computing and Big Data</h1>
  <h1>Assignment 2 </h1>
  <h1 >Rudviq Bhavsar [1002091441] </h1>
   <br>

    </header>
        <div>
        <a href="/">Home</a><br><br>
    <h1>{{display}}</h1>
    </div>
</body>
</html>
```