OASIS INFOBYTE TASK 2

UNEMPLOYMENT ANALYSIS WITH PYTHON
Analysis of Unemployment Rate During Covid-19 in India

In [1]:
```
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```

In [2]:
```
#imorting the libraries
import numpy as np
import pandas as pd
import plotly
import plotly.express as px
import plotly.graph_objects as go
import plotly.io as pio
pio.renderers.default='iframe'
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
import warnings
warnings.filterwarnings("ignore")
```

```
C:\Users\HP\anaconda3\lib\site-packages\scipy\__init__.py:146: UserWarning: A NumPy version >=1.16.5 and <1.23.0 is required for this version of
SciPy (detected version 1.23.5
  warnings.warn(f"A NumPy version >={np_minversion} and <{np_maxversion}"
```

In [3]:
```
#loading the dataset
df = pd.read_csv(r'C:\Users\HP\Desktop\Data Science\Unemployment\Unemployment_Rate_upto_11_2020.csv')
```

In [4]:
```
#checking the dataset
df.head()
```

Out[4]:

	Region	Date	Frequency	Estimated Unemployment Rate (%)	Estimated Employed	Estimated Labour Participation Rate (%)	Region.1	longitude	latitude
0	Andhra Pradesh	31-01-2020	M	5.48	16635535	41.02	South	15.9129	79.74
1	Andhra Pradesh	29-02-2020	M	5.83	16545652	40.90	South	15.9129	79.74
2	Andhra Pradesh	31-03-2020	M	5.79	15881197	39.18	South	15.9129	79.74
3	Andhra Pradesh	30-04-2020	M	20.51	11336911	33.10	South	15.9129	79.74
4	Andhra Pradesh	31-05-2020	M	17.43	12988845	36.46	South	15.9129	79.74

In [5]:
```
#clearly the dataframe shows that some column features names are incorrect, let's rename them.
df.columns =['States','Date','Frequency','Estimated Unemployment Rate','Estimated Employed',
             'Estimated Labour Participation Rate','Region','longitude','latitude']
```

In [6]:
```
#check to see if they have been changed
df.head()
```

Out[6]:

	States	Date	Frequency	Estimated Unemployment Rate	Estimated Employed	Estimated Labour Participation Rate	Region	longitude	latitude
0	Andhra Pradesh	31-01-2020	M	5.48	16635535	41.02	South	15.9129	79.74
1	Andhra Pradesh	29-02-2020	M	5.83	16545652	40.90	South	15.9129	79.74
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In [7]:
```
#checking the number of rows and column
df.shape
```

Out[7]:
```
(267, 9)
```

In [8]:
```
#checking general information
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 267 entries, 0 to 266
Data columns (total 9 columns):
 #   Column                                Non-Null Count  Dtype  
---  ------                                --------------  -----  
 0   States                                267 non-null    object 
 1   Date                                  267 non-null    object 
 2   Frequency                             267 non-null    object 
 3   Estimated Unemployment Rate           267 non-null    float64
 4   Estimated Employed                    267 non-null    int64  
 5   Estimated Labour Participation Rate   267 non-null    float64
 6   Region                                267 non-null    object 
 7   longitude                             267 non-null    float64
 8   latitude                              267 non-null    float64
dtypes: float64(4), int64(1), object(4)
memory usage: 18.9+ KB
```

In [9]:
```
#printing all the column features
df.columns.tolist()
```

Out[9]:
```
['States',
 'Date',
 'Frequency',
 'Estimated Unemployment Rate',
 'Estimated Employed',
 'Estimated Labour Participation Rate',
 'Region',
 'longitude',
 'latitude']
```

In [10]:
```
#checking for missing values
df.isna().sum()
```

Out[10]:
```
States                                0
Date                                  0
Frequency                             0
Estimated Unemployment Rate           0
Estimated Employed                    0
Estimated Labour Participation Rate   0
Region                                0
longitude                             0
latitude                              0
dtype: int64
```

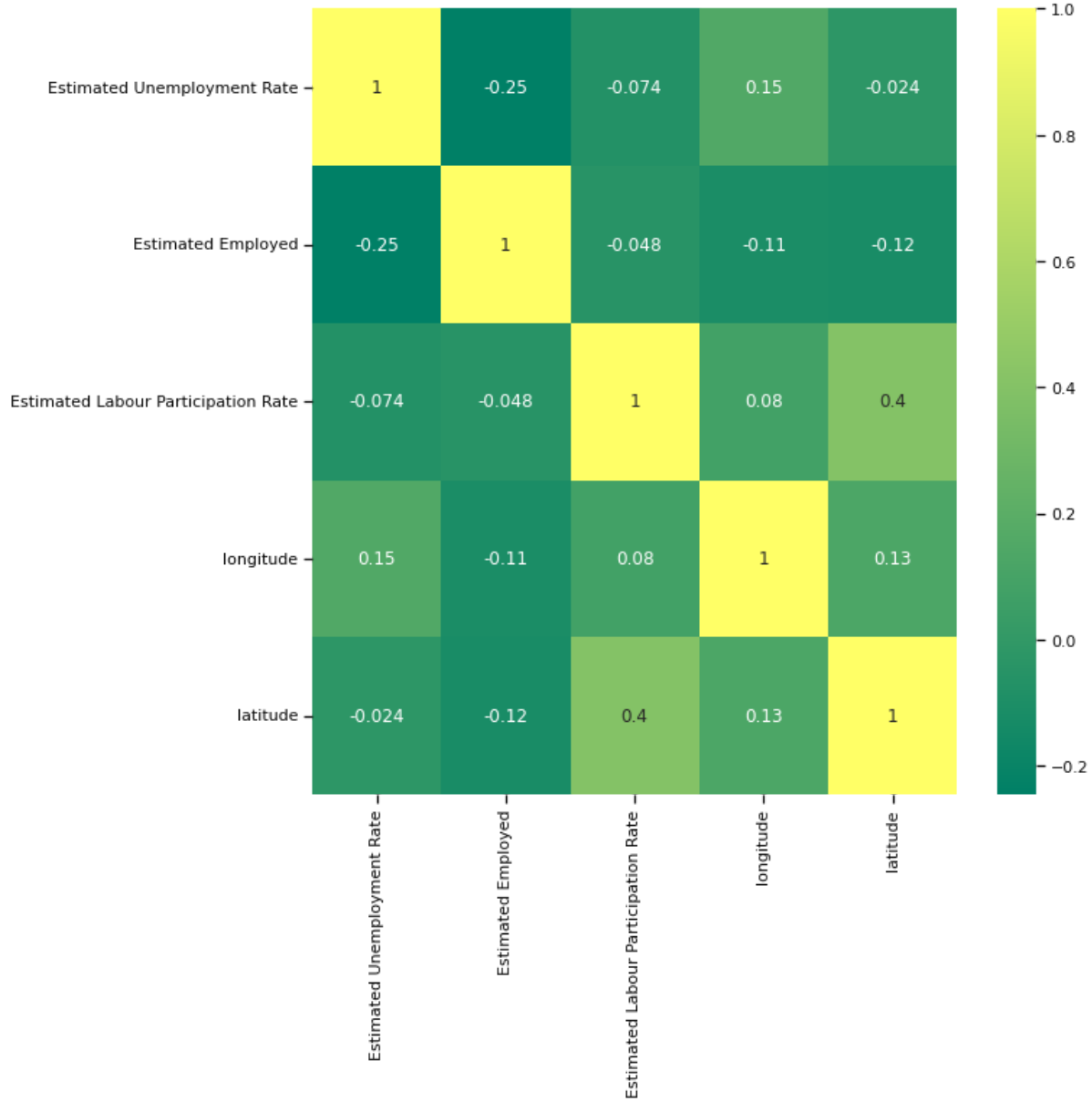
In [11]:
```
#printing computed general statistics
df.describe().T
```

Out[11]:

	count	mean	std	min	25%	50%	75%	max
Estimated Unemployment Rate	267.0	1.223693e+01	1.080328e+01	0.5000	4.845000e+00	9.650000e+00	1.675500e+01	7.585000e+01
Estimated Employed	267.0	1.396211e+07	1.336632e+07	117542.0000	2.838930e+06	9.732417e+06	2.187869e+07	5.943376e+07
Estimated Labour Participation Rate	267.0	4.168157e+01	7.845419e+00	16.7700	3.726500e+01	4.039000e+01	4.405500e+01	6.969000e+01
longitude	267.0	2.282605e+01	6.270731e+00	10.8505	1.811240e+01	2.361020e+01	2.727840e+01	3.377820e+01
latitude	267.0	8.053242e+01	5.831738e+00	71.1924	7.608560e+01	7.901930e+01	8.527990e+01	9.293760e+01

checking the correlation of dataset features

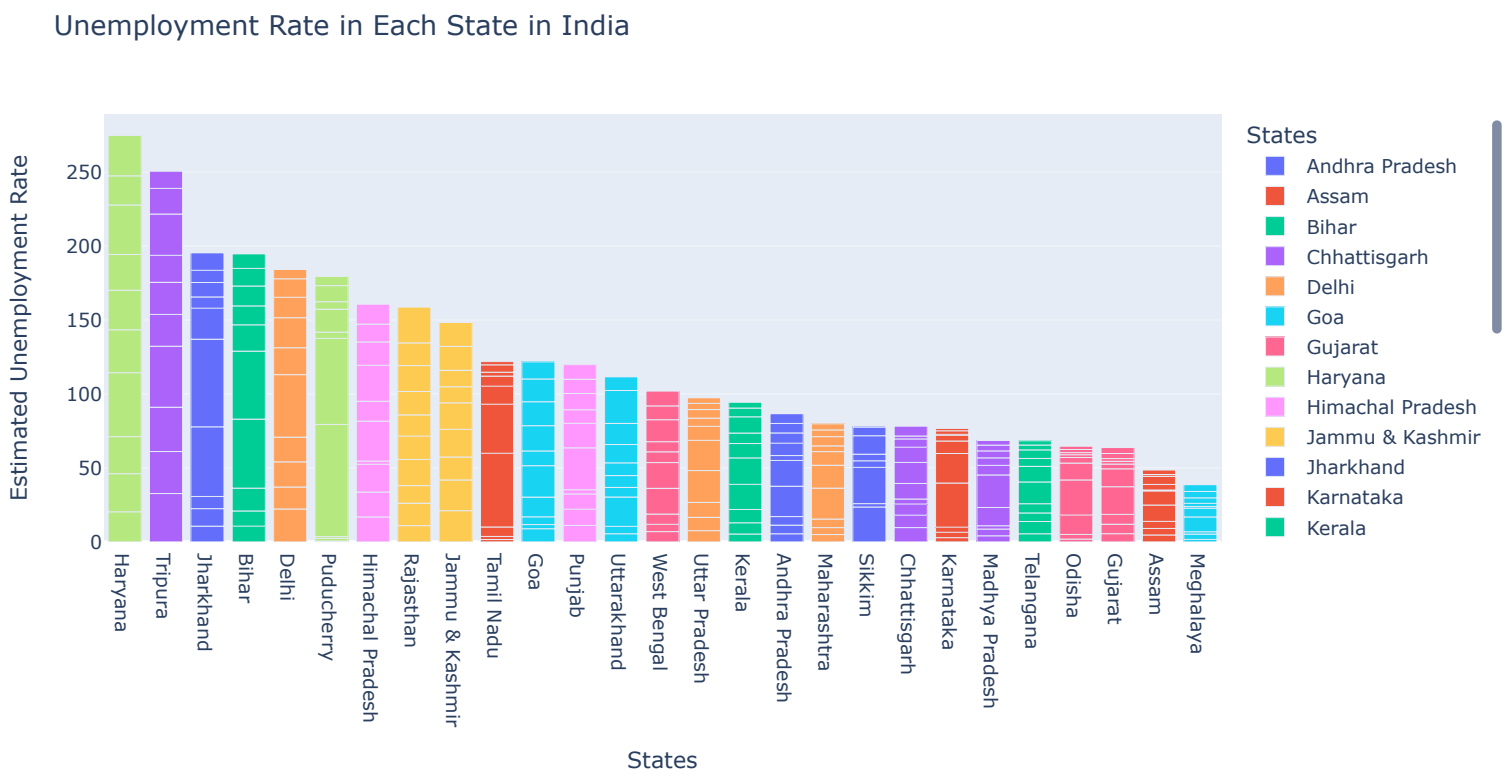
In [12]:
```
#define the features of the dataset
heat_maps = df[['Estimated Unemployment Rate',
       'Estimated Employed', 'Estimated Labour Participation Rate',
       'longitude', 'latitude']]
#printing the correlation
heat_maps = heat_maps.corr()
#setting the fig size and plot
plt.figure(figsize=(10,10))
sns.set_context('notebook',font_scale=1)
sns.heatmap(heat_maps, annot=True,cmap='summer');
```



obviously estimated labour participation rate has a very strong correlation for measuring unemployment.

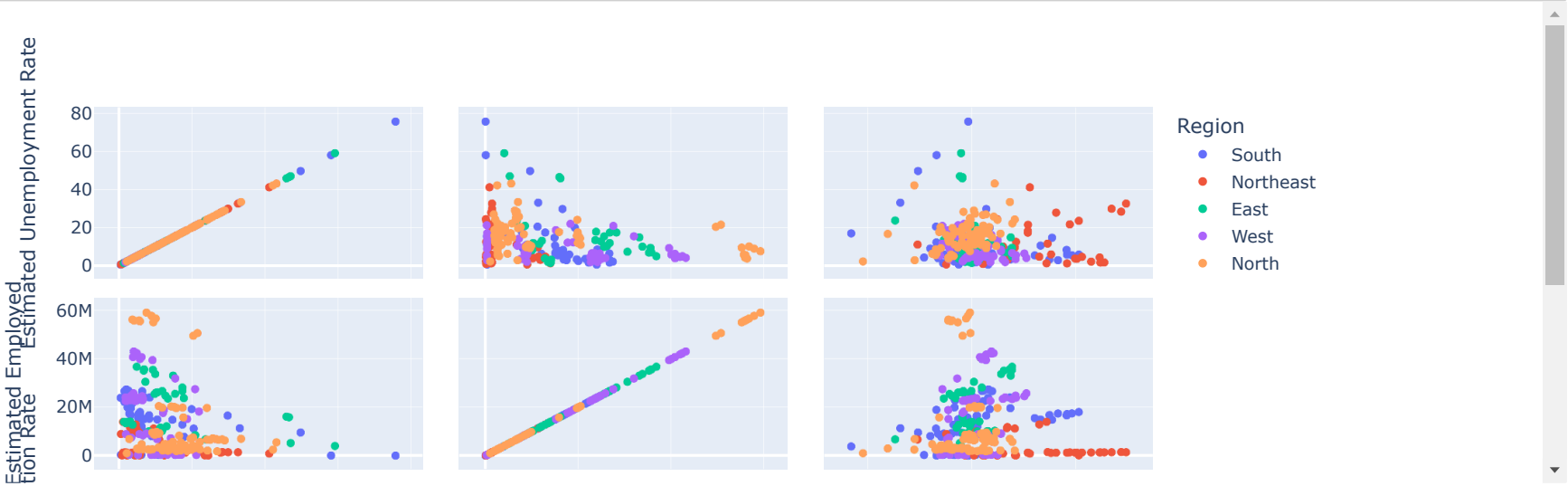
Unemployemnt Rate in Each State in India

In [13]:
```
fig = px.bar(df,x='States',y='Estimated Unemployment Rate',color='States',
             title='Unemployment Rate in Each State in India',template='plotly')
fig.update_layout(xaxis={'categoryorder':'total descending'})
fig.show()
```



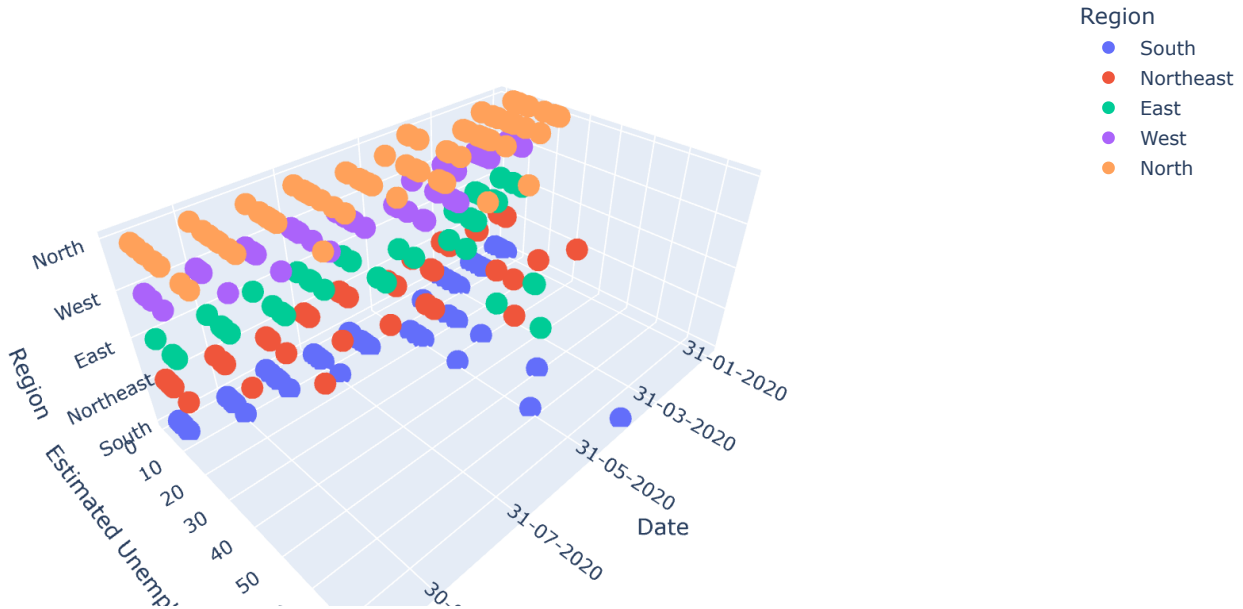
Scatter Matrix Relationship

In [14]:
```
fig = px.scatter_matrix(df,template='plotly',
    dimensions=['Estimated Unemployment Rate','Estimated Employed',
                'Estimated Labour Participation Rate'],
    color='Region')
fig.show()
```



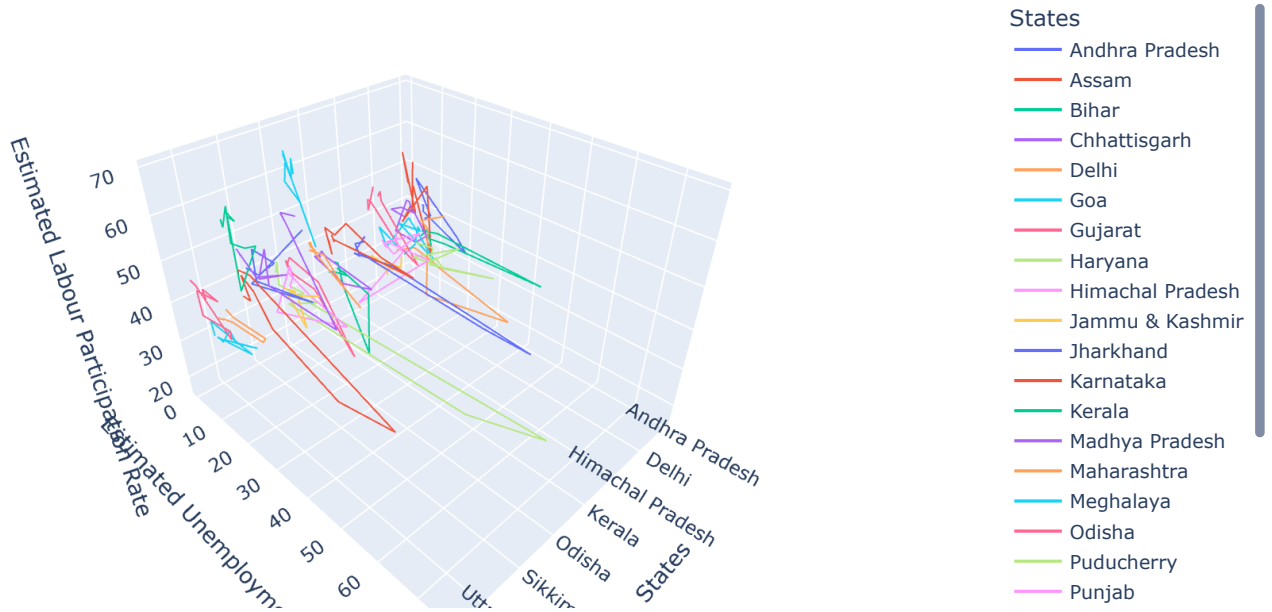
Unemployment Rate by Date and Region

In [15]:
```
#visualizing the rate
fig = px.scatter_3d(df, x = 'Date', y = 'Estimated Unemployment Rate', z = 'Region', color='Region')
fig.show()
fig.write_image('3d.png')
```



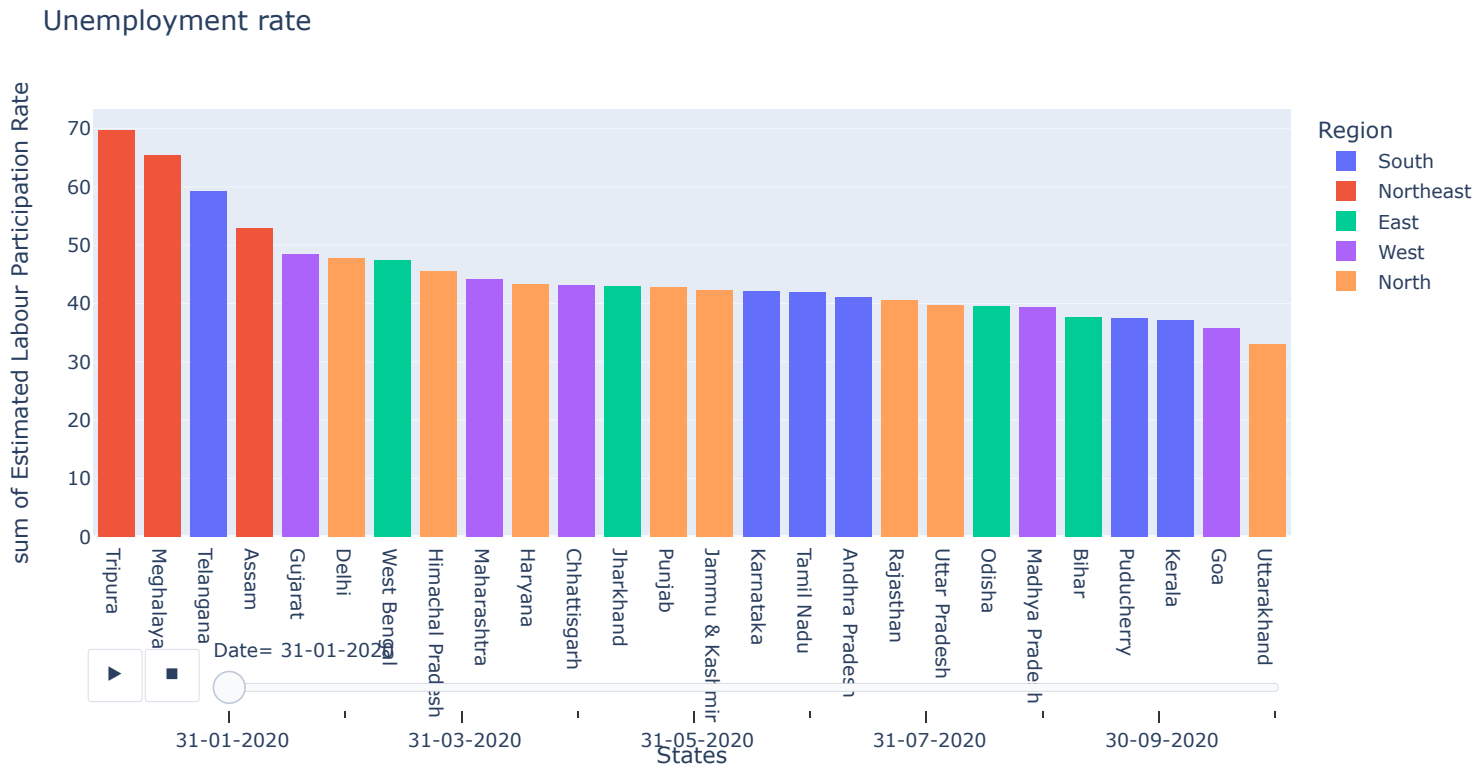
Unemployment Rate, States and Labour Participation

In [16]:
```
#visualizing the rate
fig = px.line_3d(df, x = 'States', y = 'Estimated Unemployment Rate',
                 z = 'Estimated Labour Participation Rate', color='States')
fig.show()
fig.write_image('3d.png')
```



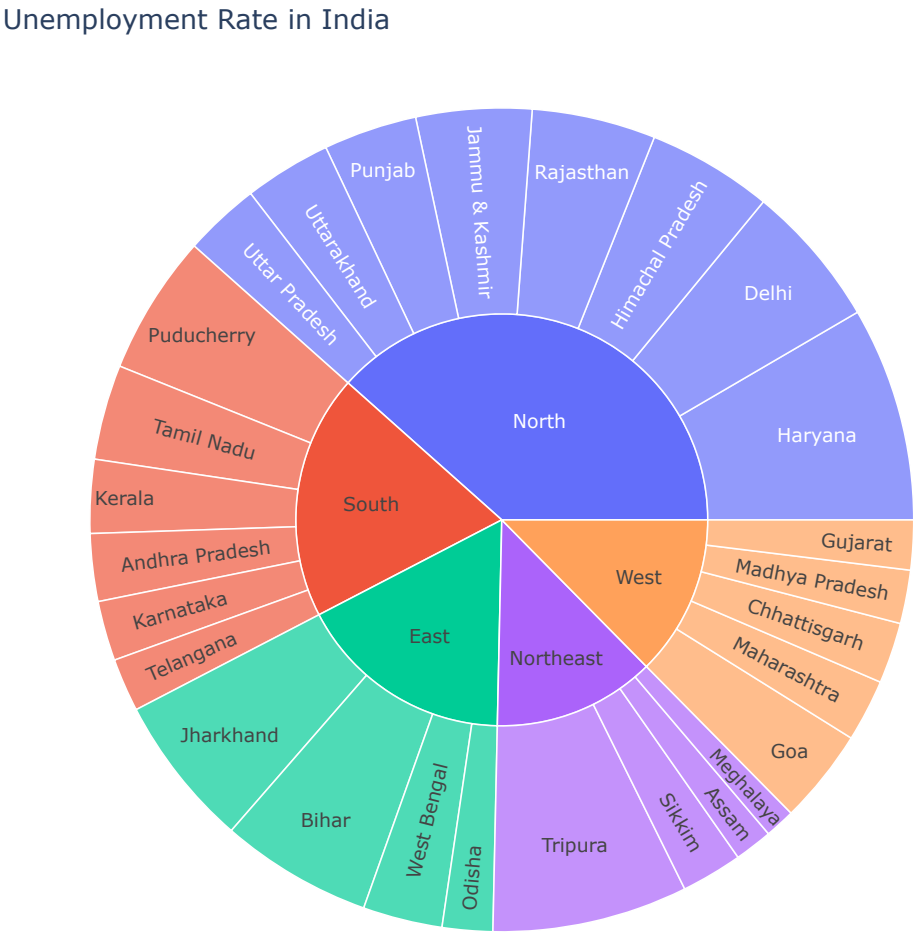
Unemployment Rate According to Labour Participation

In [17]:
```
fg = px.histogram(df,x='States',y='Estimated Labour Participation Rate',color='Region',title='Unemployment rate',
                  animation_frame='Date',template='plotly')
fg.update_layout(xaxis={'categoryorder':'total descending'})
fg.show()
```



Final Visual Summary of Unemployment Rate

In [18]:
```
unemploment = df[["States", "Region", "Estimated Unemployment Rate"]]
figure = px.sunburst(unemploment, path=["Region", "States"],
                     values="Estimated Unemployment Rate",
                     width=700, height=700, color_continuous_scale="RdY1Gn",
                     title="Unemployment Rate in India")
figure.show()
```



Thank You.