Oasis Infobyte Internship,May-2023

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Unemployment Analysis With Python

- Objective:Unemployment is measured by the unemployment rate which is the number of people who are unemployed as a percentage of the total labour force.
- Dataset Link:https://www.kaggle.com/datasets/gokulrajkmv/unemployment-in-india
- Dataset Information: This dataset contains the unemployment rate of all the states in India

  Region = states in India Date = date which the unemployment rate observed Frequency = measuring frequency (Monthly) Estimated Unemployment Rate (%) = percentage of people unemployed in each States of India Estimated Employed = percentage of people employed Estimated Labour Participation Rate (%) = labour force participation rate by dividing the number of people actively participating in the labour force by the total number of people eligible to participate in the labor force force

- Steps we follow
- set the working directory
- Import the required library set
- Checking and cleaning the dataset
- Unemployment rate analysis
- Conclusions

Setting Working Directories

In [2]:
```
import os
os.chdir("H:\\Data Science\\Internship\\Oasis Infobyte")
```

Importing required libraries

In [3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
## Supress warnings
import warnings
warnings.filterwarnings("ignore")
```

In [4]:
```
data = pd.read_csv("unemployment.csv")
print("data has been successfully loaded")
```

```
data has been successfully loaded
```

Checking and cleaning the dataset

In [5]:
```
data
```

Out[5]:

	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	79.740
1	Andhra Pradesh	29-02-2020	M	5.83	16545652	40.90	South	15.9129	79.740
2	Andhra Pradesh	31-03-2020	M	5.79	15881197	39.18	South	15.9129	79.740
3	Andhra Pradesh	30-04-2020	M	20.51	11336911	33.10	South	15.9129	79.740
4	Andhra Pradesh	31-05-2020	M	17.43	12988845	36.46	South	15.9129	79.740
...	...	...	...	...	...	...	...	...	...
262	West Bengal	30-06-2020	M	7.29	30726310	40.39	East	22.9868	87.855
263	West Bengal	31-07-2020	M	6.83	35372506	46.17	East	22.9868	87.855
264	West Bengal	31-08-2020	M	14.87	33298644	47.48	East	22.9868	87.855
265	West Bengal	30-09-2020	M	9.35	35707239	47.73	East	22.9868	87.855
266	West Bengal	31-10-2020	M	9.98	33962549	45.63	East	22.9868	87.855

267 rows × 9 columns

In [6]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 267 entries, 0 to 266
Data columns (total 9 columns):
 #   Column                                    Non-Null Count  Dtype
---  ------                                    --------------  -----
 0   Region                                    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.1                                  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 [7]:
```
data.shape
```

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

In [8]:
```
data.describe()
```

Out[8]:

	Estimated Unemployment Rate (%)	Estimated Employed	Estimated Labour Participation Rate (%)	longitude	latitude
count	267.000000	2.670000e+02	267.000000	267.000000	267.000000
mean	12.236929	1.396211e+07	41.681573	22.826048	80.532425
std	10.803283	1.336632e+07	7.845419	6.270731	5.831738
min	0.500000	1.175420e+05	16.770000	10.850500	71.192400
25%	4.845000	2.838930e+06	37.265000	18.112400	76.085600
50%	9.650000	9.732417e+06	40.390000	23.610200	79.019300
75%	16.755000	2.187869e+07	44.055000	27.278400	85.279900
max	75.850000	5.943376e+07	69.690000	33.778200	92.937600

- we got statistical summary of our dataset

Let’s see if this dataset contains missing values or not:

In [9]:
```
print(data.isnull().sum())
```

```
Region                                      0
 Date                                       0
 Frequency                                  0
 Estimated Unemployment Rate (%)            0
 Estimated Employed                         0
 Estimated Labour Participation Rate (%)    0
Region.1                                    0
longitude                                   0
latitude                                    0
dtype: int64
```

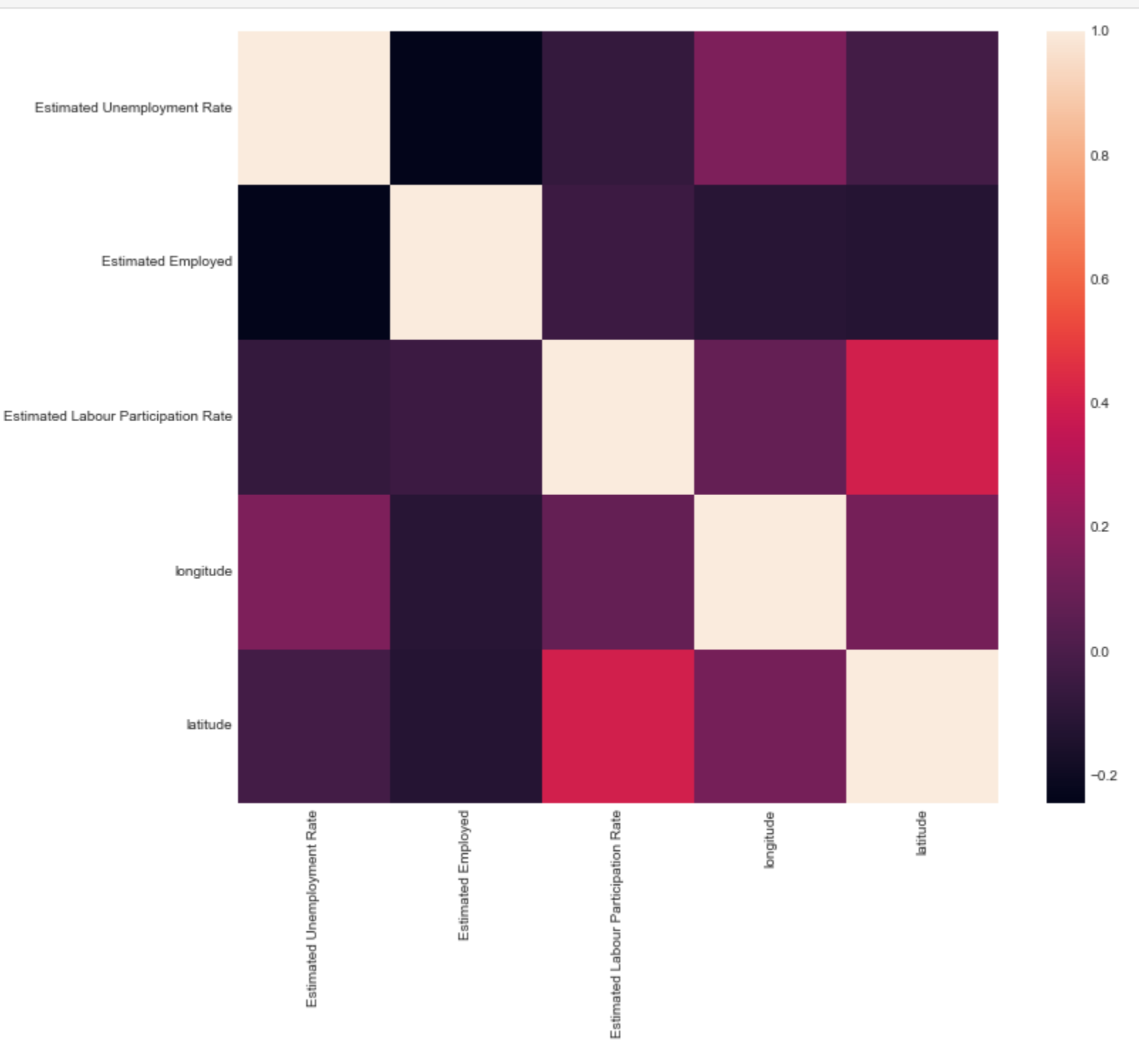
- While analyzing the missing values, I found that the column names are not correct. So, for a better understanding of this data, I will rename all the columns:

In [10]:
```
data.columns= ["States","Date","Frequency",
               "Estimated Unemployment Rate",
               "Estimated Employed",
               "Estimated Labour Participation Rate",
               "Region","longitude","latitude"]
```

Now let’s have a look at the correlation between the features of this dataset:

Heatmap

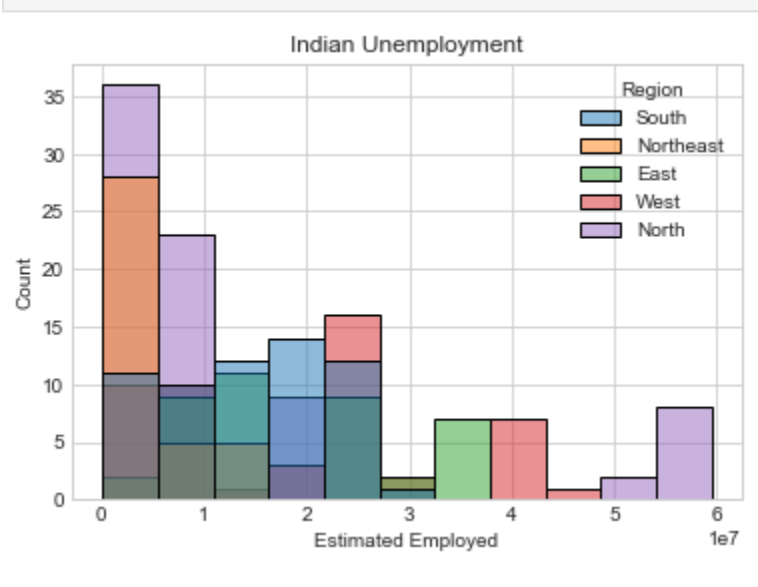
In [11]:
```
plt.style.use('seaborn-whitegrid')
plt.figure(figsize=(12, 10))
sns.heatmap(data.corr())
plt.show()
```



Unemployment Rate Analysis: Data Visualization

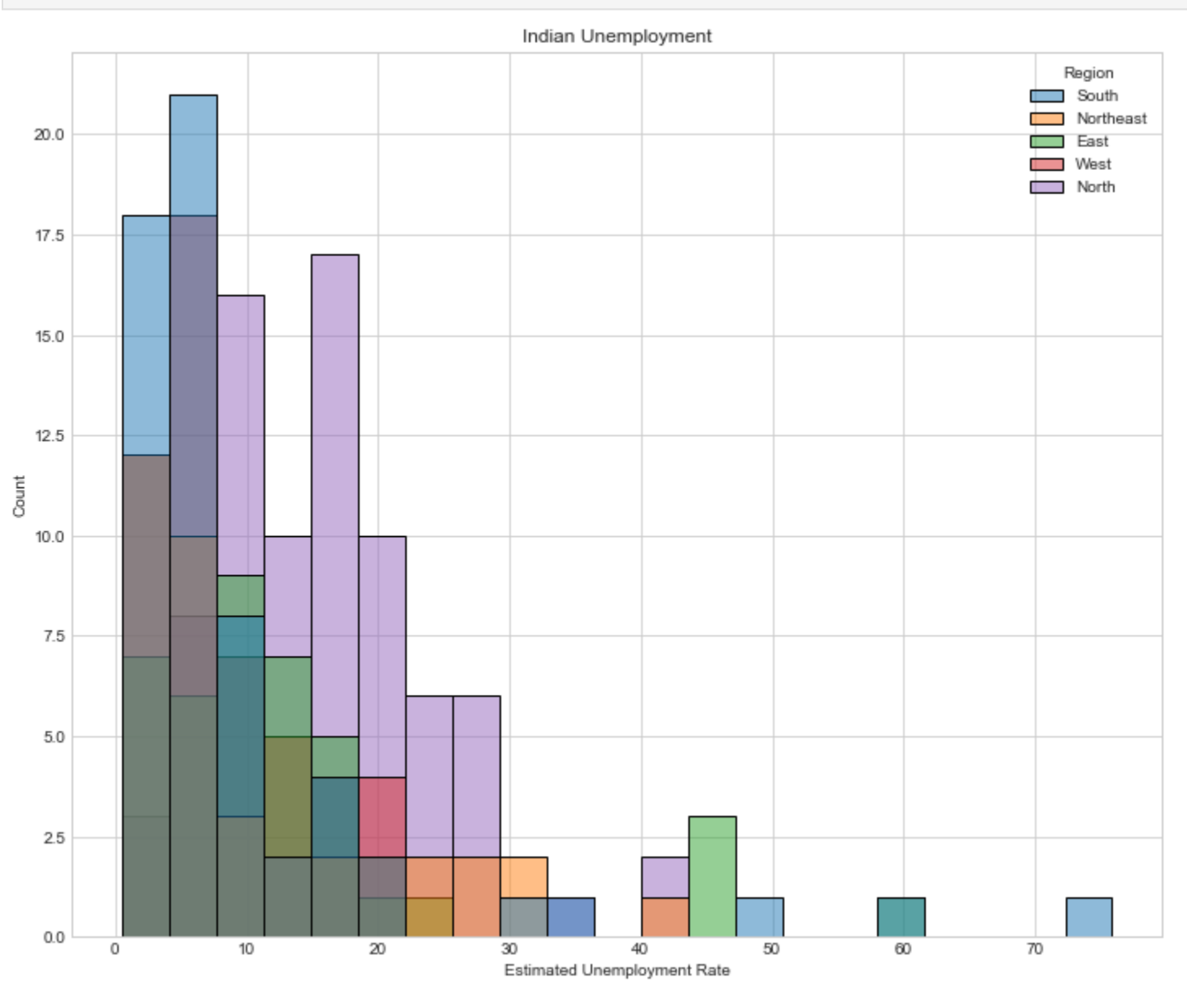
- Now let’s visualize the data to analyze the unemployment rate. I will first take a look at the estimated number of employees according to different regions of India:

In [12]:
```
data.columns= ["States","Date","Frequency",
               "Estimated Unemployment Rate","Estimated Employed",
               "Estimated Labour Participation Rate","Region",
               "longitude","latitude"]
plt.title("Indian Unemployment")
sns.histplot(x="Estimated Employed", hue="Region", data=data)
plt.show()
```



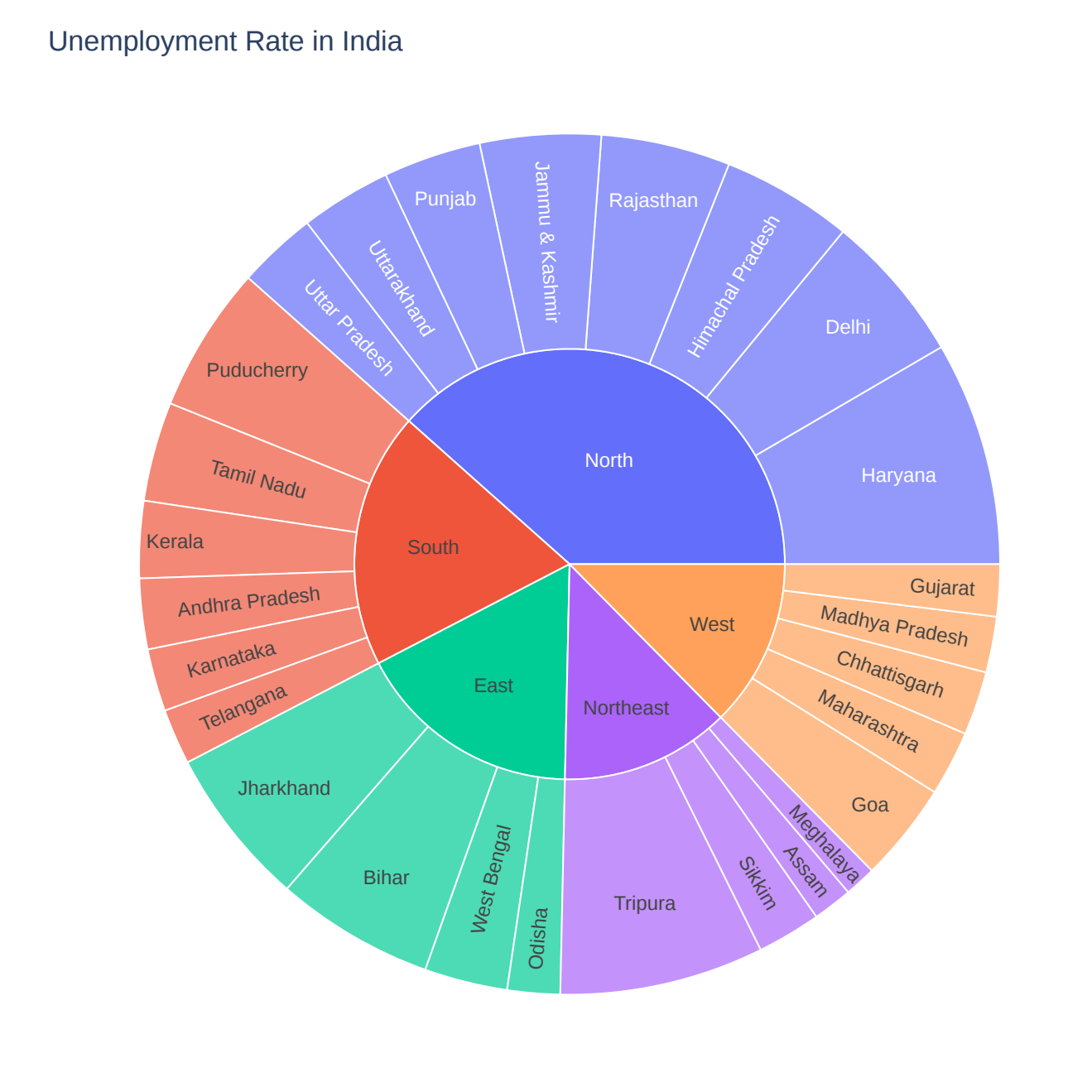
Now let’s see the unemployment rate according to different regions of India:

In [13]:
```
plt.figure(figsize=(12, 10))
plt.title("Indian Unemployment")
sns.histplot(x="Estimated Unemployment Rate", hue="Region", data=data)
plt.show()
```



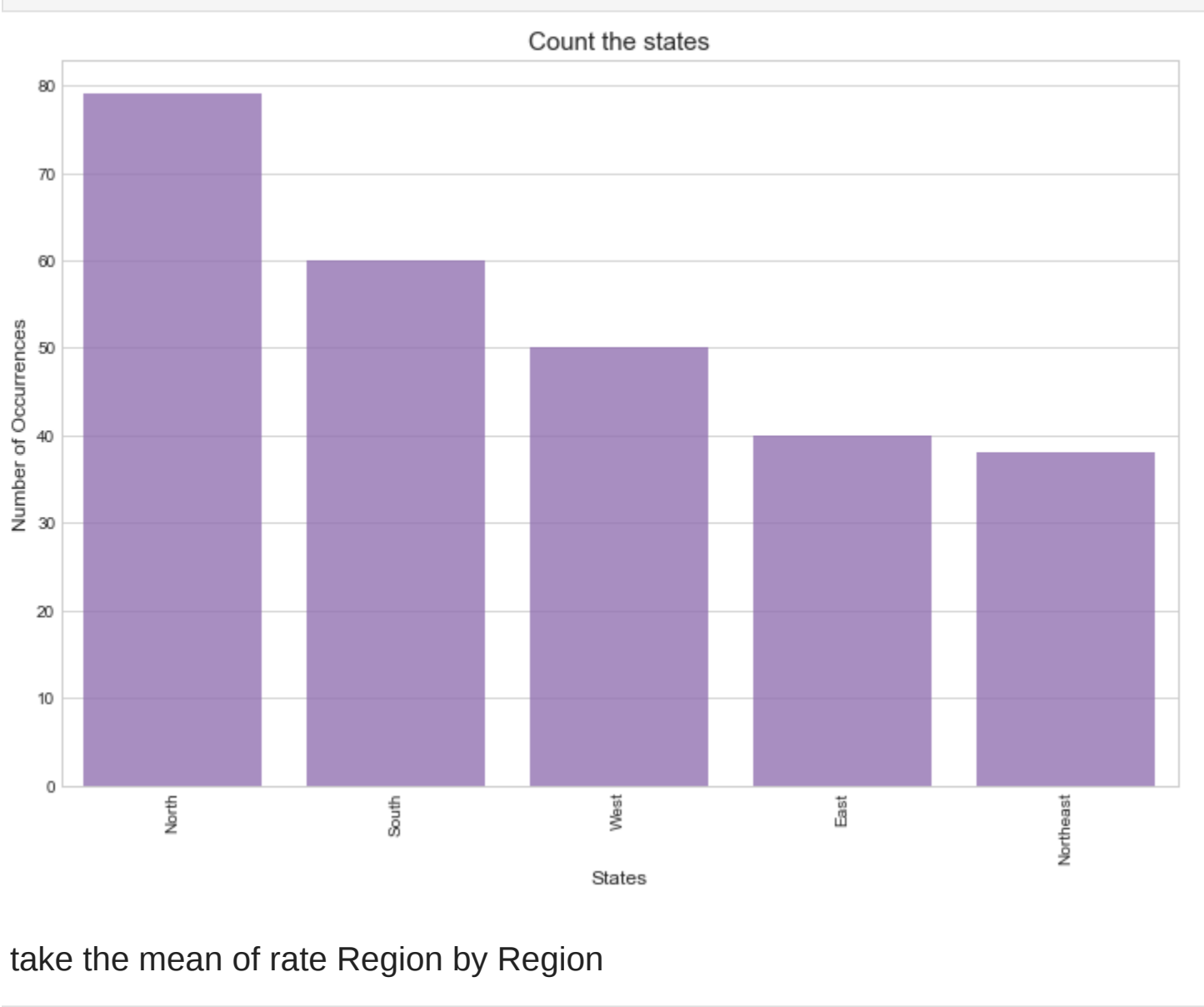
Now let’s create a dashboard to analyze the unemployment rate of each Indian state by region. For this, I’ll use a sunburst plot:

In [14]:
```
unemploment = data[["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()
```



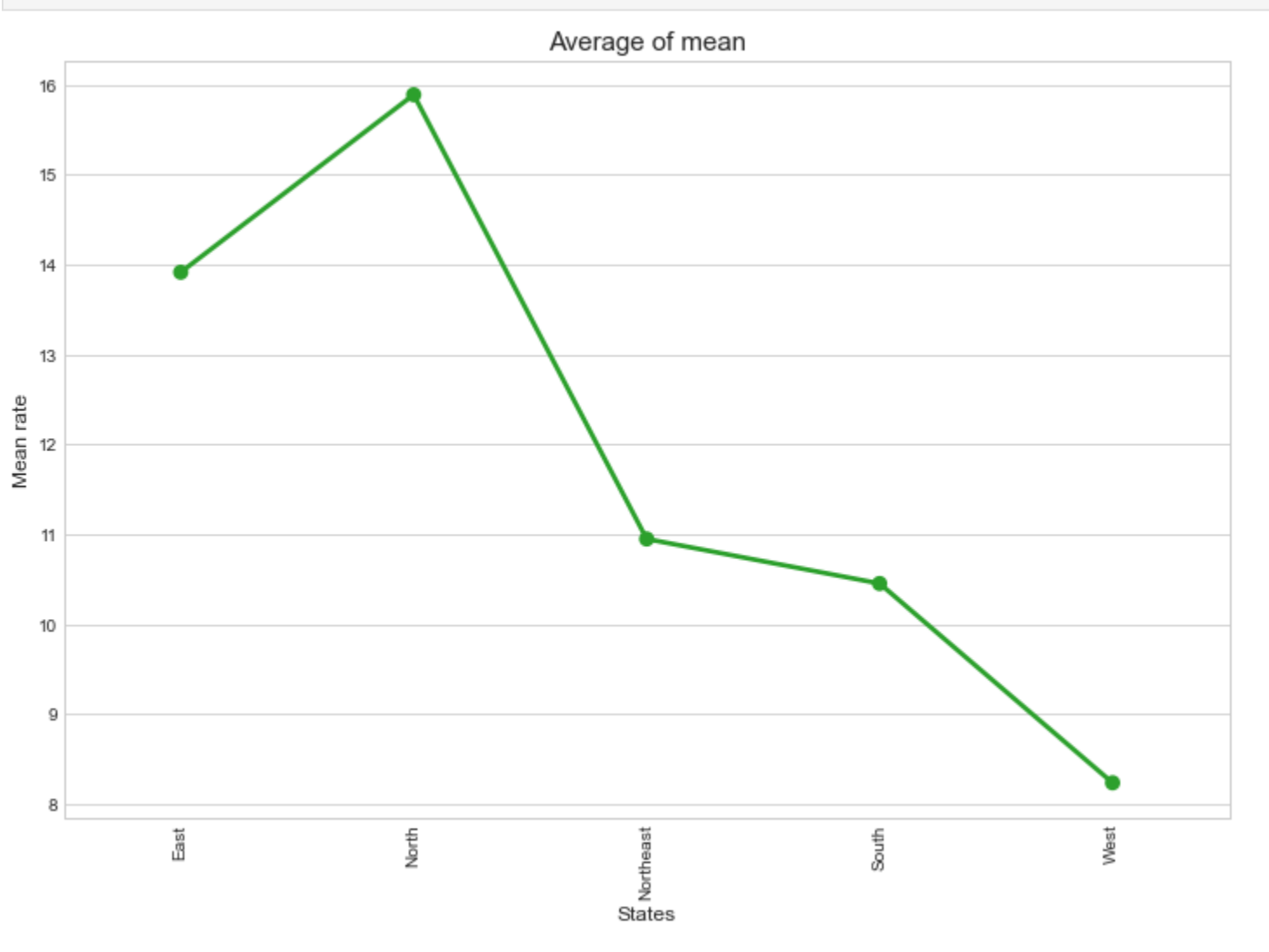
Which Region has the most data

In [15]:
```
color = sns.color_palette()
cnt_srs = data.Region.value_counts()

plt.figure(figsize=(12,8))
sns.barplot(cnt_srs.index, cnt_srs.values, alpha=0.8, color=color[4])
plt.ylabel('Number of Occurrences', fontsize=12)
plt.xlabel('States', fontsize=12)
plt.title('Count the states', fontsize=15)
plt.xticks(rotation='vertical')
plt.show()
```



take the mean of rate Region by Region

In [16]:
```
grouped_df = data.groupby(["Region"])["Estimated Unemployment Rate"].aggregate("mean").reset_index()

plt.figure(figsize=(12,8))
sns.pointplot(grouped_df['Region'].values, grouped_df['Estimated Unemployment Rate'].values, alpha=0.8, color=color[2])
plt.ylabel('Mean rate', fontsize=12)
plt.xlabel('States', fontsize=12)
plt.title("Average of mean", fontsize=15)
plt.xticks(rotation='vertical')
plt.show()
```



see the number of unique Region

In [17]:
```
data.Region.nunique()
```

Out[17]:
```
5
```

See exact numbers

In [18]:
```
make_total = data.pivot_table("Estimated Unemployment Rate",index=['Region'],aggfunc='mean')
topstate=make_total.sort_values(by='Estimated Unemployment Rate',ascending=False)[:47]
print(topstate)
```

```
           Estimated Unemployment Rate
Region
North                        15.889620
East                         13.916000
Northeast                    10.950263
South                        10.454667
West                          8.239000
```

Calculate which models has highest yearly fluncations

In [19]:
```
maketotal_1 = data.pivot_table(values='Estimated Unemployment Rate',index=['Region'],aggfunc=np.std)
df1 = maketotal_1.reset_index().dropna(subset=['Estimated Unemployment Rate'])
df2 = df1.loc[df1.groupby('Region')['Estimated Unemployment Rate'].idxmax()]
for index,row in df2.iterrows():
    print(row['Region'],"Region which",row['Region'],"has the highest yearly fluncation.")
```

```
East Region which East has the highest yearly fluncation.
North Region which North has the highest yearly fluncation.
Northeast Region which Northeast has the highest yearly fluncation.
South Region which South has the highest yearly fluncation.
West Region which West has the highest yearly fluncation.
```

Conclusions:

- So this is how you can analyze the unemployment rate by using the Python programming language.
- Unemployment is measured by the unemployment rate which is the number of people who are unemployed as a percentage of the total labour force.
- East Region which East has the highest yearly fluncation.
- North Region which North has the highest yearly fluncation.
- Northeast Region which Northeast has the highest yearly fluncation.
- South Region which South has the highest yearly fluncation.
- West Region which West has the highest yearly fluncation.

Suggestions are always Welcome!

Thank You!