Experiment No 09

AIM :   Visualization in python using Seaborn Library.

THEORY : Data Visualization is the presentation of data in pictorial format. It is extremely important for Data Analysis, primarily because of the fantastic ecosystem of data-centric Python packages. And it helps to understand the data, however complex it is, the significance of data by summarizing and presenting a huge amount of data in a simple and easy-to-understand format and helps communicate information clearly and effectively.

Pandas and Seaborn is one of those packages and makes importing and analyzing data much easier. In this article, we will use Pandas and Seaborn to analyze data.Seaborn helps to visualize the statistical relationships. To understand how variables in a dataset are related to one another and how that relationship is dependent on other variables, we perform statistical analysis. This Statistical analysis helps to visualize the trends and identify various patterns in the dataset.
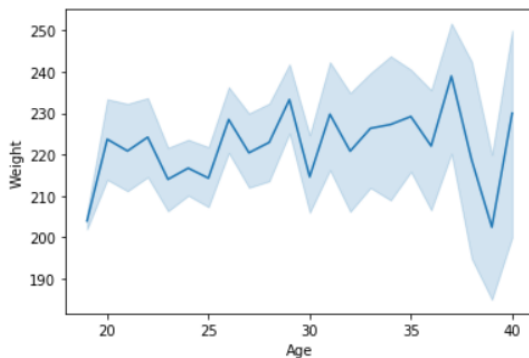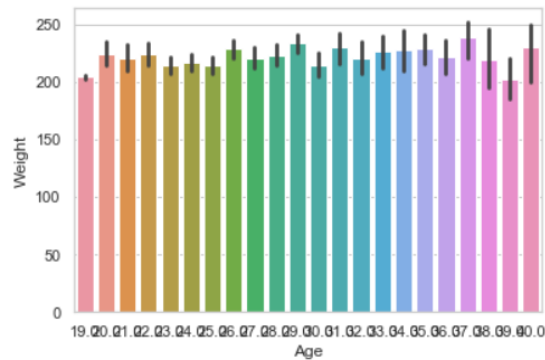

Line plot: Line Plot Is the most popular plot to draw a relationship between x and y with possibility of several semantic groupings.
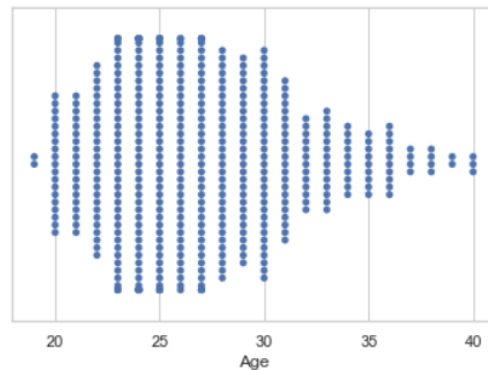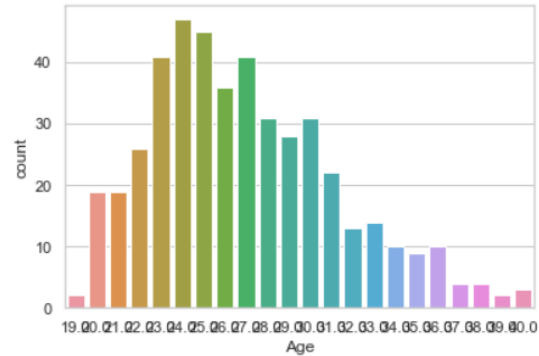
Swarm plot: A swarm plot is similar to a strip plot, We can draw a swarm plot with the non-overlapping points against categorical data.
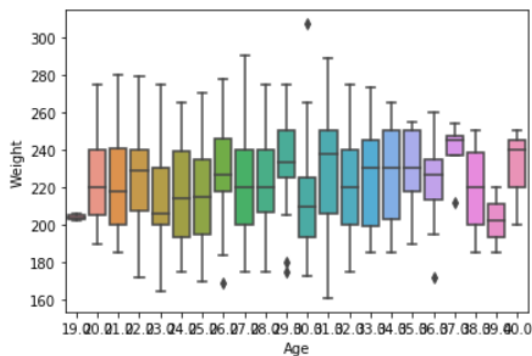
Bar plot: Barplot represents an estimate of central tendency for a numeric variable with the height of each rectangle and provides some   using bars.indication of the uncertainty around that estimate using error bars.

Count plot: Count plot used to Show the counts of observations in each categorical bin

Box plot: A box plot (or box-and-whisker plots is the visual representation depicting groups of numerical data through their quartiles against categorical data.
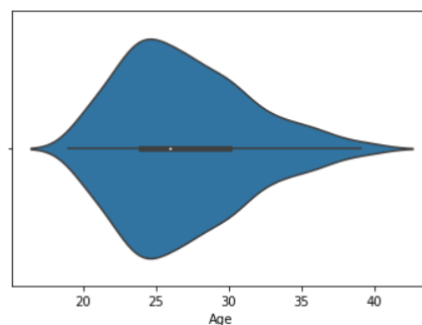
Violin Plot: A violin plot is similar to a boxplot. It shows several quantitative data across one or more categorical variables such that those distributions can be compared.
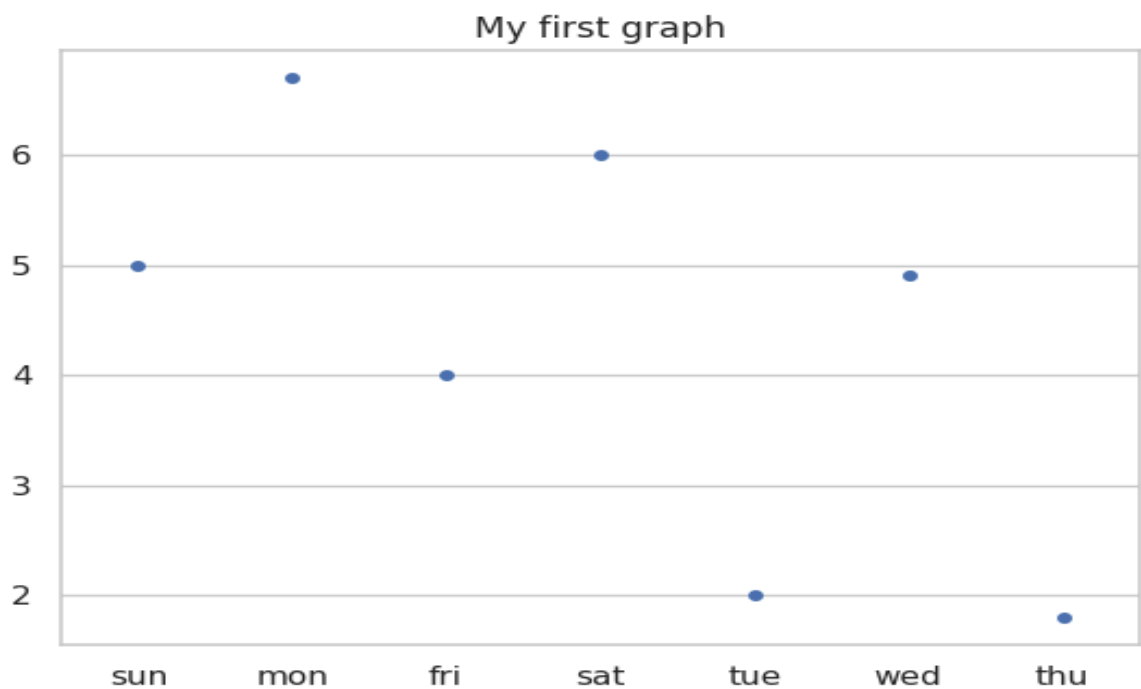
STRIP PLOT

```
[1]  import matplotlib.pyplot as plt
     import seaborn as sns
```

```
x =['sun', 'mon', 'fri', 'sat', 'tue', 'wed', 'thu']
y =[5, 6.7, 4, 6, 2, 4.9, 1.8]
xa = sns.stripplot(x=x, y=y)
ax.set(xlabel='Days', ylabel='Amount_spend')
plt.title('My first graph')
plt.show()
```
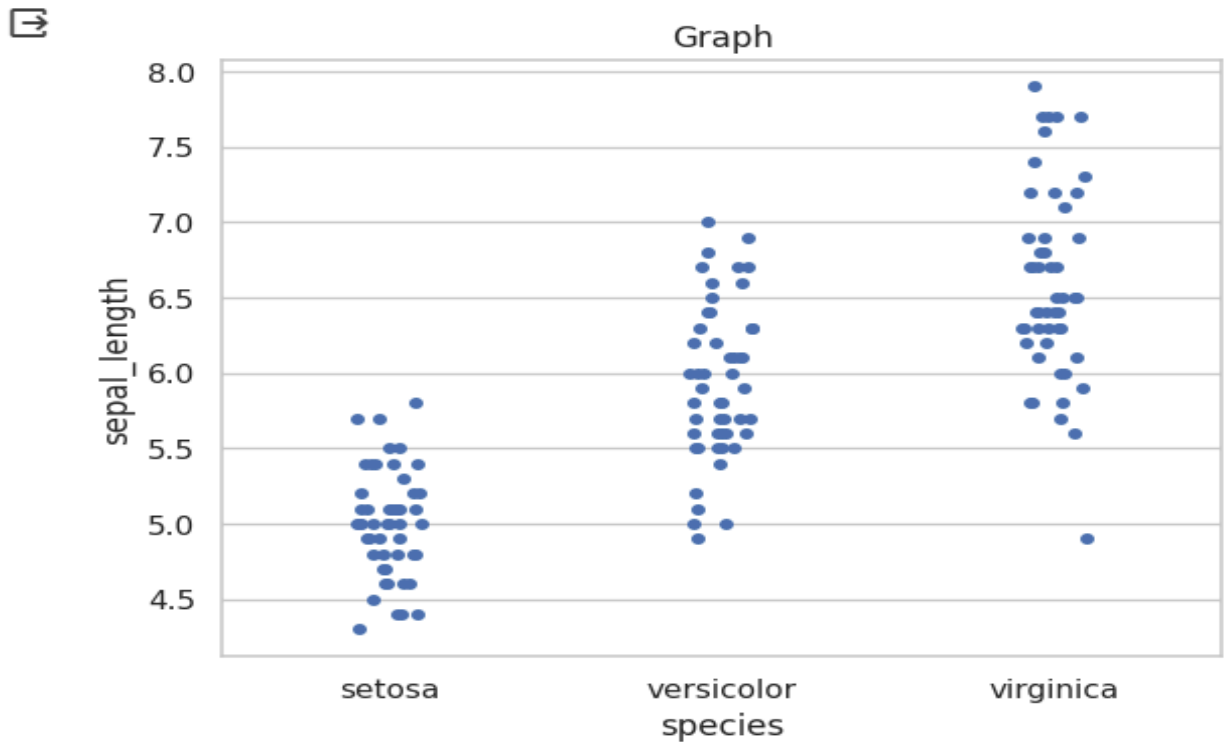
STRIP PLOT USING BUILTIN DATASET

```
[23] import matplotlib.pyplot as plt
     import seaborn as sns
```

```
sns.set(style="whitegrid")
iris = sns.load_dataset('iris')
ax = sns.stripplot(x='species', y='sepal_length', data=iris)
plt.title('Graph')
plt.show()
```
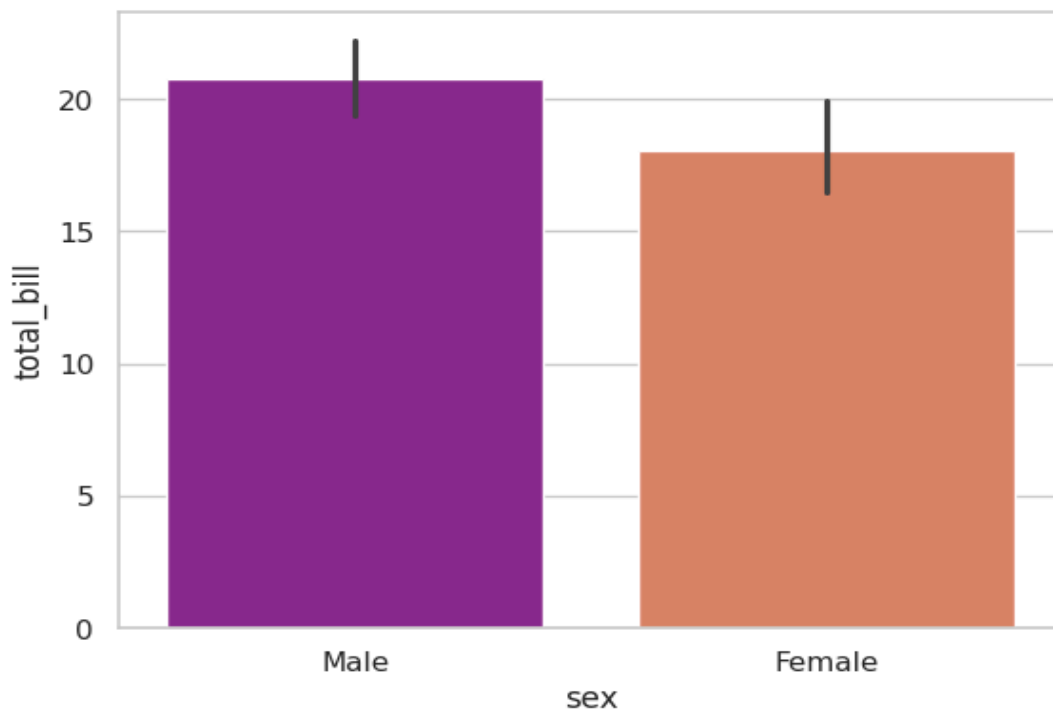
BAR PLOT

```
[48] import seaborn as sns
     df = sns.load_dataset('tips')
     sns.barplot(x ='sex', y ='total_bill', data = df,
     palette ='plasma')
```

```
<ipython-input-48-c3d79920f590>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in

  sns.barplot(x ='sex', y ='total_bill', data = df,
<Axes: xlabel='sex', ylabel='total_bill'>
```
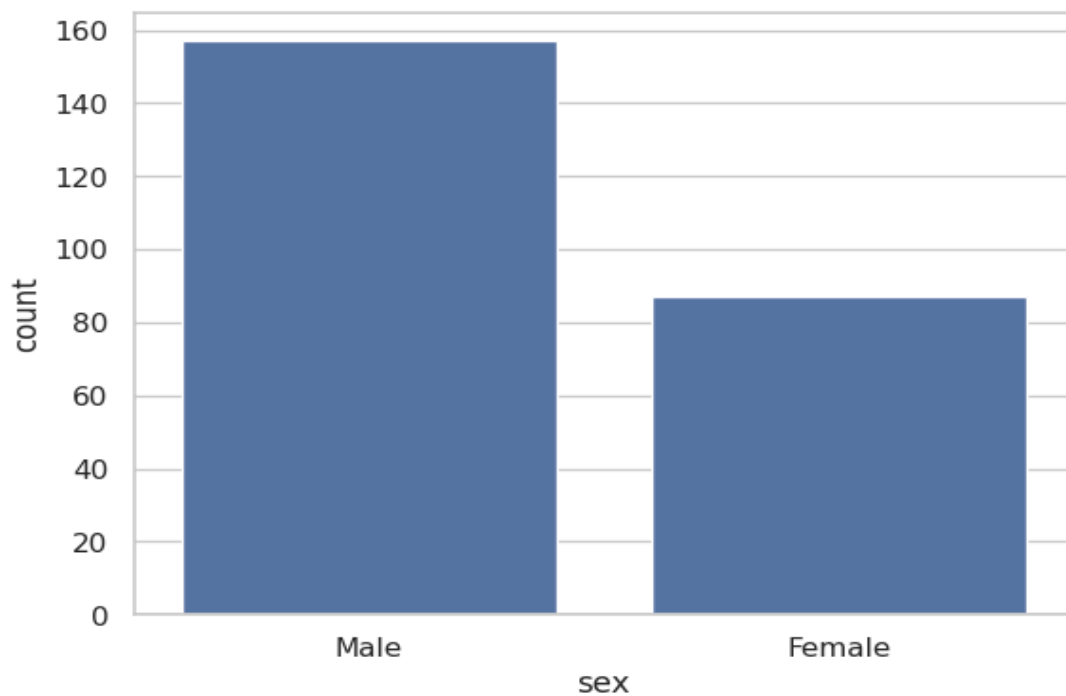
COUNT PLOT

```
[47] import seaborn as sns
     df = sns.load_dataset('tips')
     sns.countplot(x ='sex', data = df)
```

<Axes: xlabel='sex', ylabel='count'>

BOX PLOT

```
[49] import seaborn as sns
     df = sns.load_dataset('tips')
     sns.boxplot(x='day', y='total_bill', data=df, hue='smoker')

     <Axes: xlabel='day', ylabel='total_bill'>
```
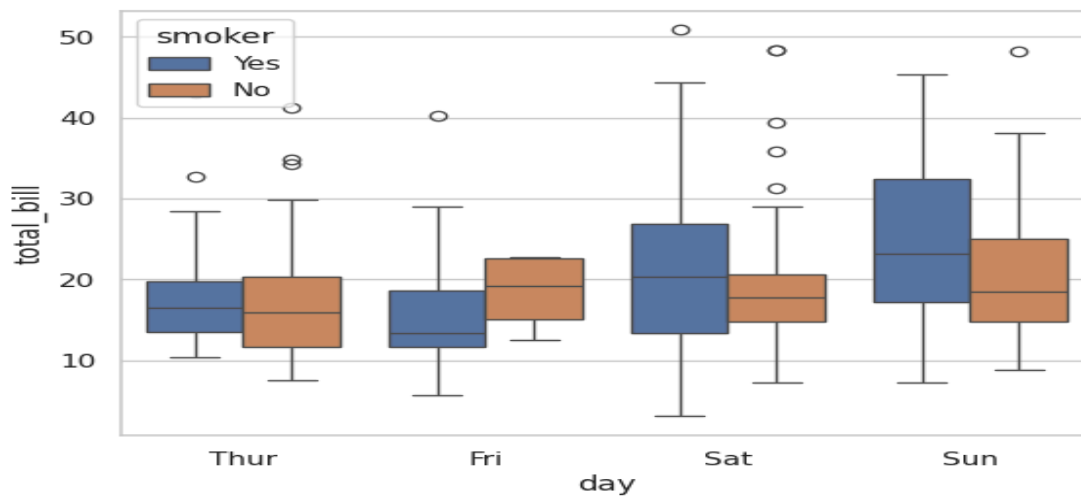

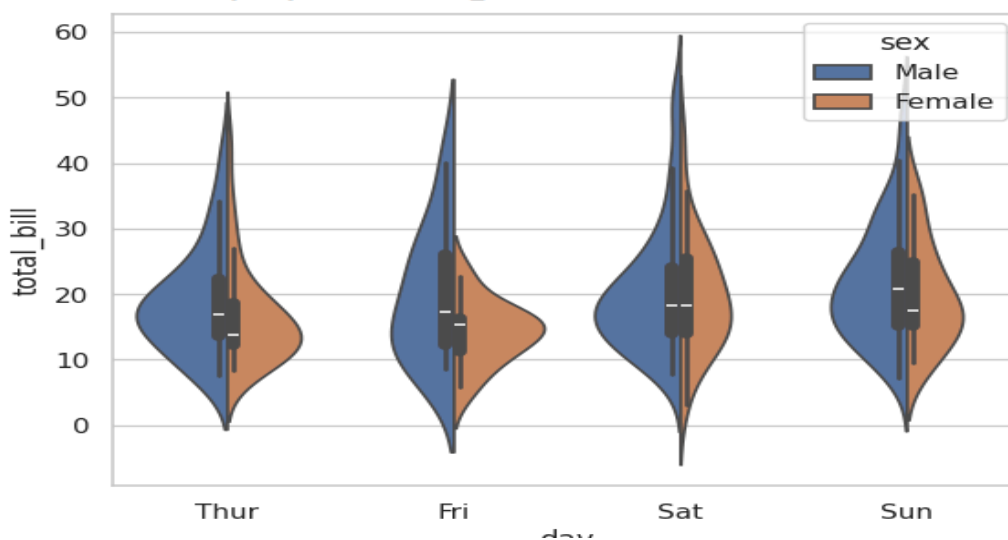## VIOLIN PLOT

```
[50] import seaborn as sns
     df = sns.load_dataset('tips')
     sns.violinplot(x='day', y='total_bill', data=df,
     hue='sex', split=True)

     <Axes: xlabel='day', ylabel='total_bill'>
```
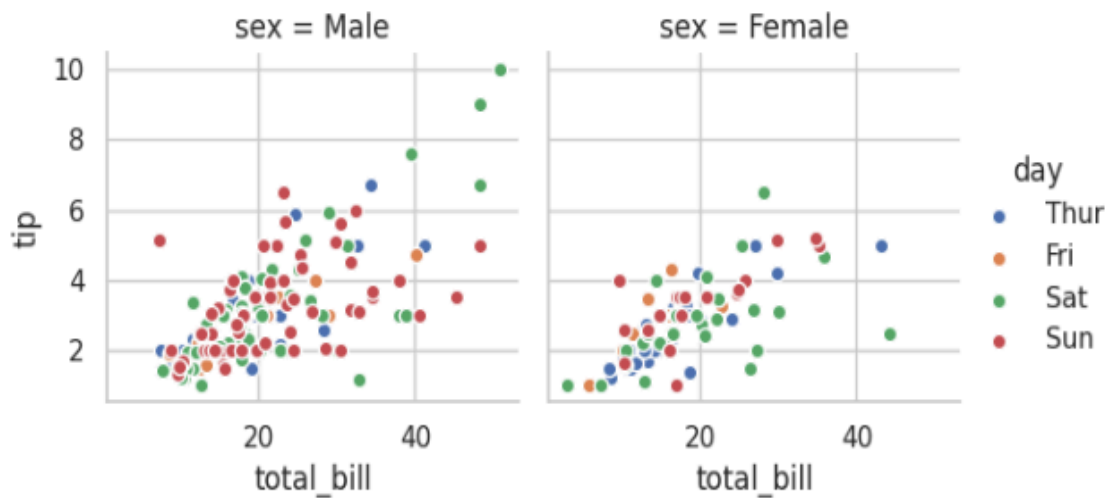
seaborn.FacetGrid

```python
[54] import seaborn
     import matplotlib.pyplot as plt
```

```python
df = seaborn.load_dataset('tips')
graph = seaborn.FacetGrid(df, col ="sex", hue ="day")
graph.map(plt.scatter, "total_bill", "tip", edgecolor ="w").add_legend()
plt.show()
```

HEAT MAP

```python
import numpy as np
import seaborn as sn
import matplotlib.pyplot as plt
```

```python
data = np.random.randint(low = 1,
high = 100,
size = (10, 10))
print("The data to be plotted:\n")
print(data)
```

The data to be plotted:

```
[[75 77 93 75 69 26  4 17 76 25]
 [ 4 63  4 30 10 52 89 57 96 28]
 [65  1 49 54 17 29 86 13 51 43]
 [74 24 64 44 15 11 19 77 83  1]
 [64 44 12 37 90 19 47 81 91 32]
 [25 25 30 69 31 18 68 10 76 98]
 [89 87 61 86 70 76 51 40 77 41]
 [ 4 12 72 69  9 82 95 18  5 97]
 [90 63 74 85 94 79 32 54  2 59]
 [43 92 17 52 70 68  1 29 58 94]]
```

```python
[53] hm = sn.heatmap(data = data)
plt.show()
```
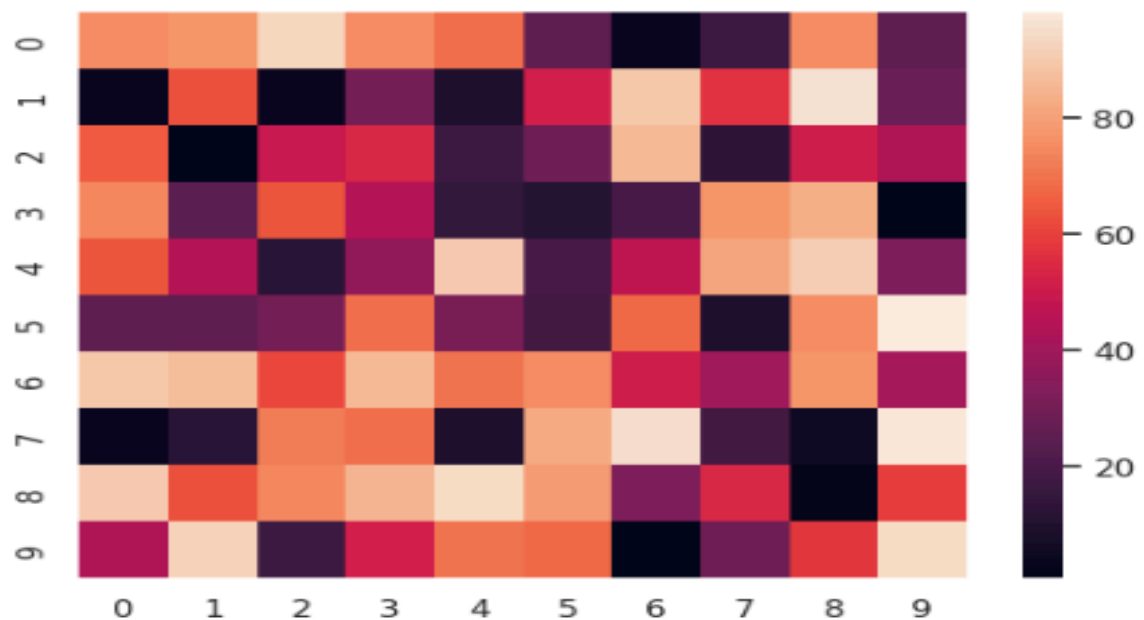
```
import seaborn
import matplotlib.pyplot as plt
```

```
df = seaborn.load_dataset('tips')
graph = seaborn.FacetGrid(df, row ='smoker', col ='time')
graph.map(plt.hist, 'total_bill', bins = 15, color ='orange')
plt.show()
```


CONCLUSION : We successfully performed Visualization in python using Seaborn Library.