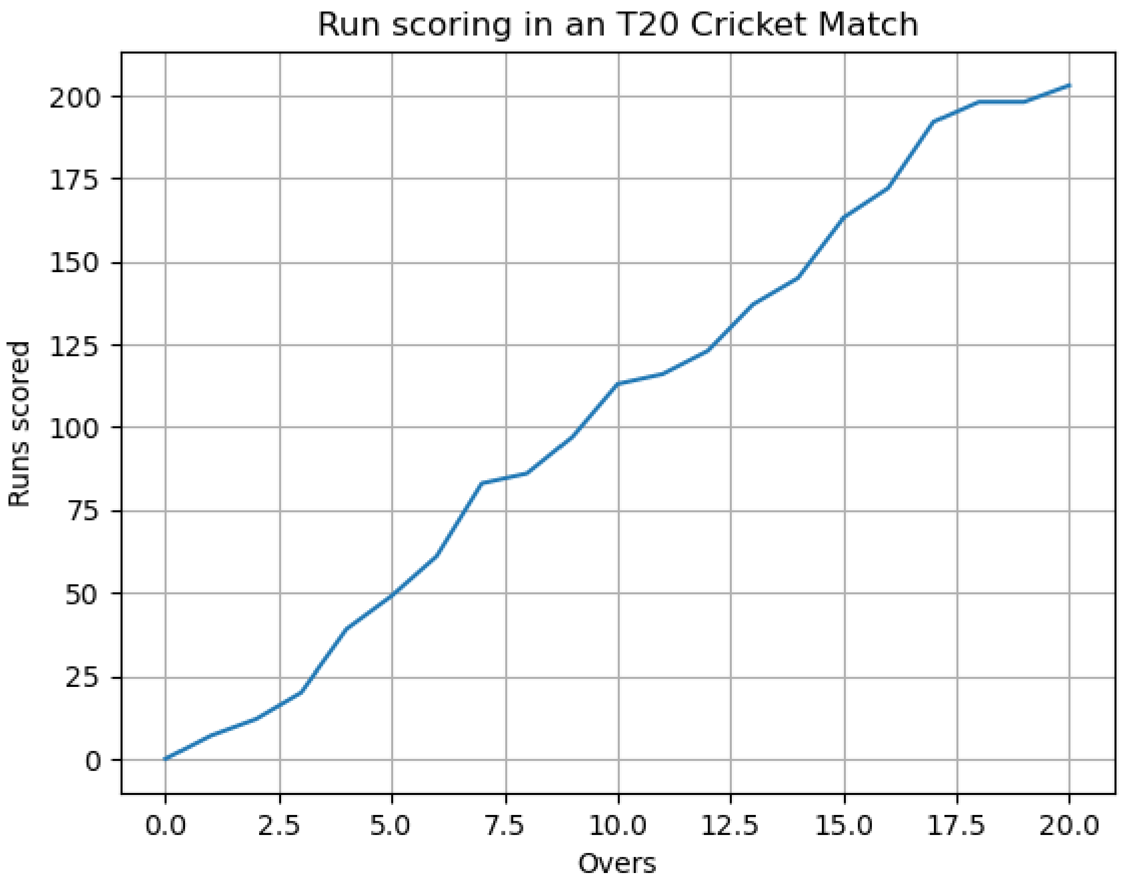
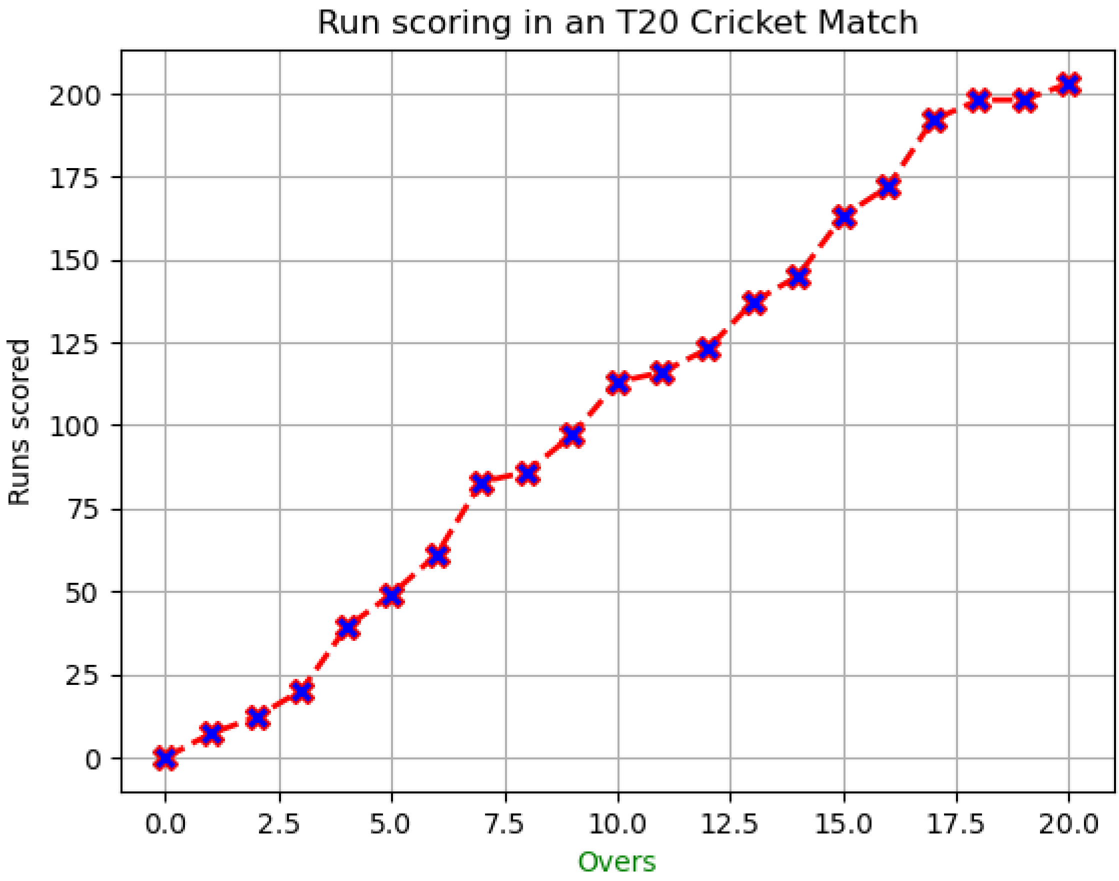
In [1]:

```
#6a) Write a Python program to illustrate Linear Plotting using Matplotlib.

import matplotlib.pyplot as plt
# Hypothetical data: Run rate in an T20 cricket match
overs = [0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20]
runs_scored = [0,7,12,20,39,49,61,83,86,97,113,116,
               123,137,145,163,172,192,198,198,203]

# Create a linear plot
plt.plot(overs, runs_scored)

# Add labels and title
plt.xlabel('Overs')
plt.ylabel('Runs scored')
plt.title('Run scoring in an T20 Cricket Match')

# Display the plot
plt.grid(True)
plt.show()
```



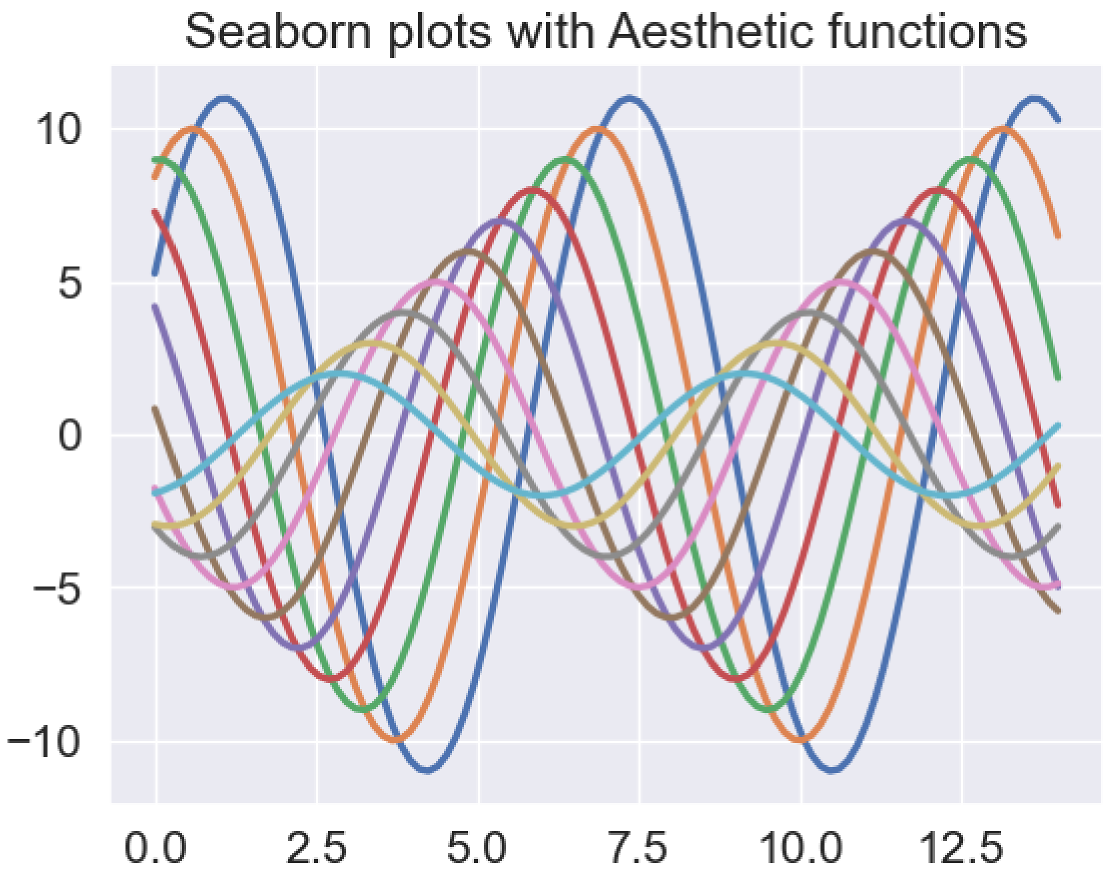
In [2]:

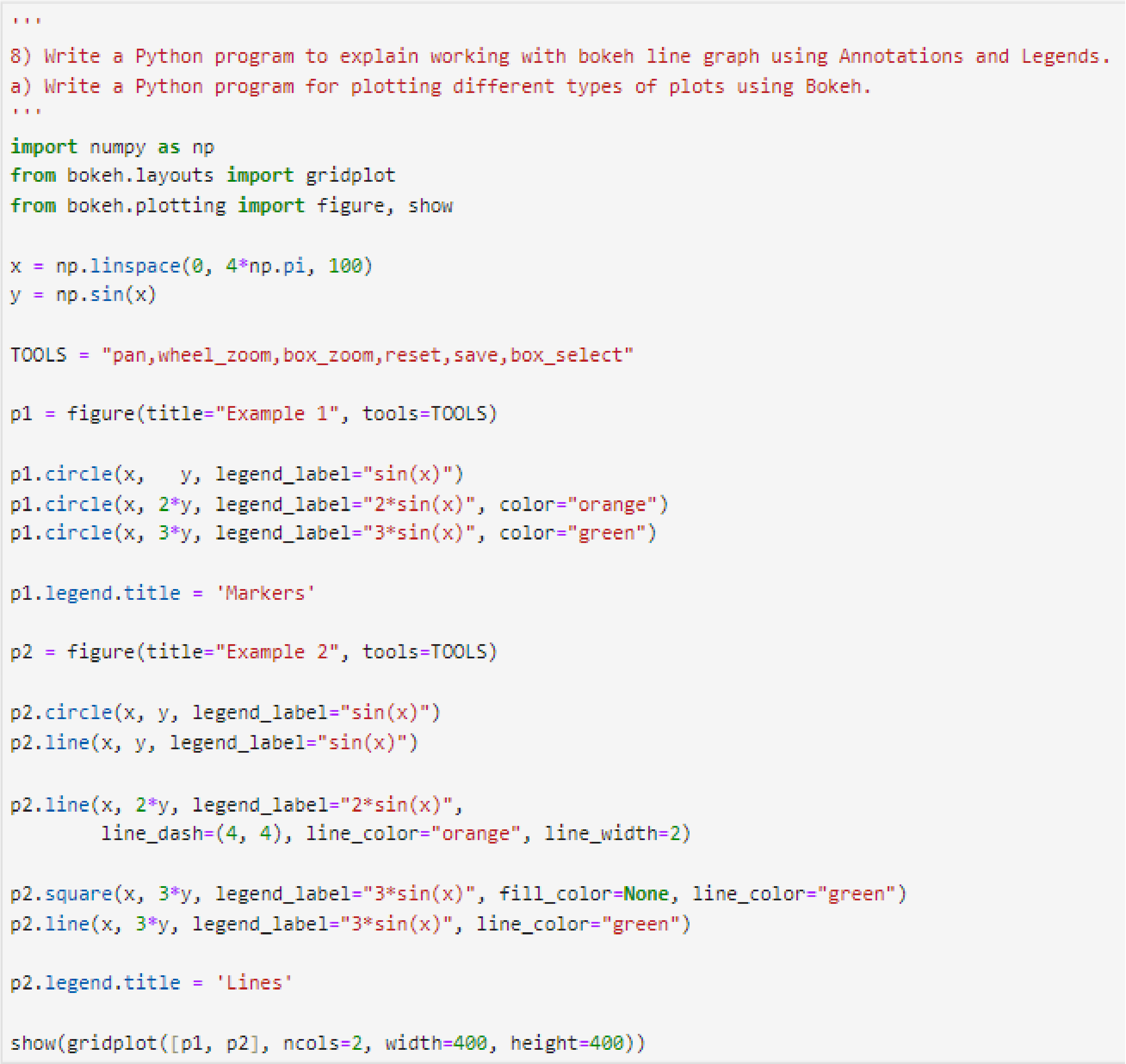
```
'''
6b) Write a Python program to illustrate liner plotting with line formatting
using Matplotlib.
'''

import matplotlib.pyplot as plt
# Hypothetical data: Run rate in an T20 cricket match
overs = [0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20]
runs_scored = [0,7,12,20,39,49,61,83,86,97,113,116,123,137,
               145,163,172,192,198,198,203]

# Create a linear plot
plt.plot(overs, runs_scored, marker='X', linestyle='dashed',color='red',
         linewidth=2, markerfacecolor='blue', markersize=8)

# Add labels and title
plt.xlabel('Overs', color = 'green')
plt.ylabel('Runs scored')
plt.title('Run scoring in an T20 Cricket Match')

# Display the plot
plt.grid(True)
plt.show()

```



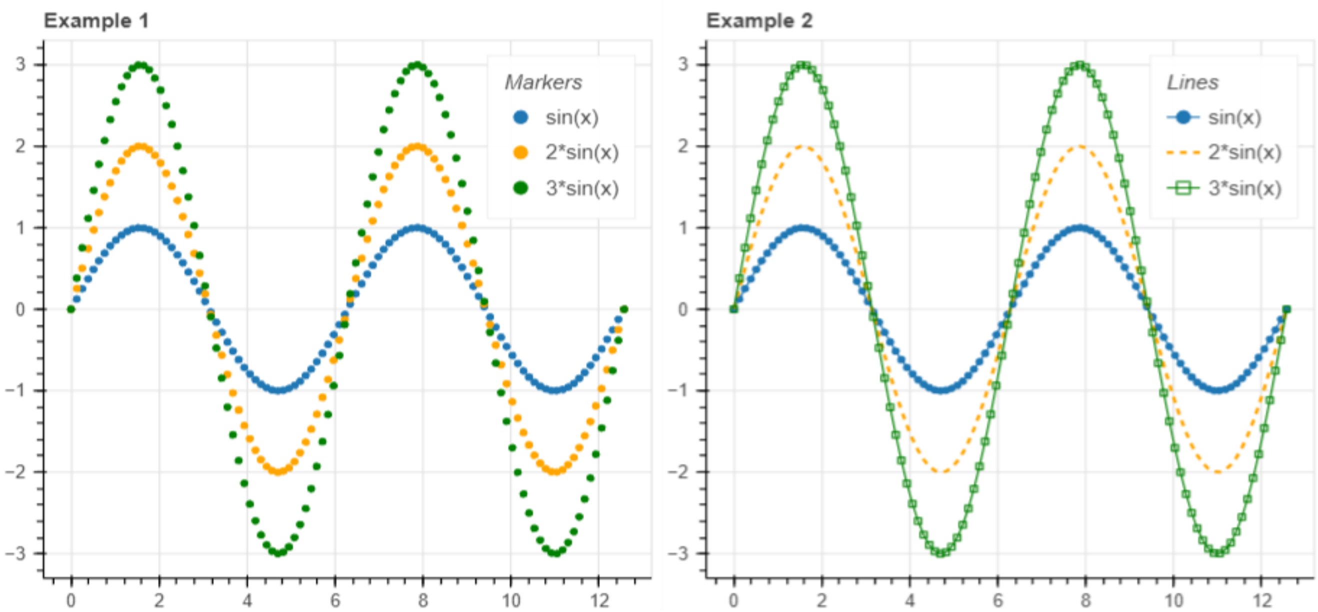
In [3]:

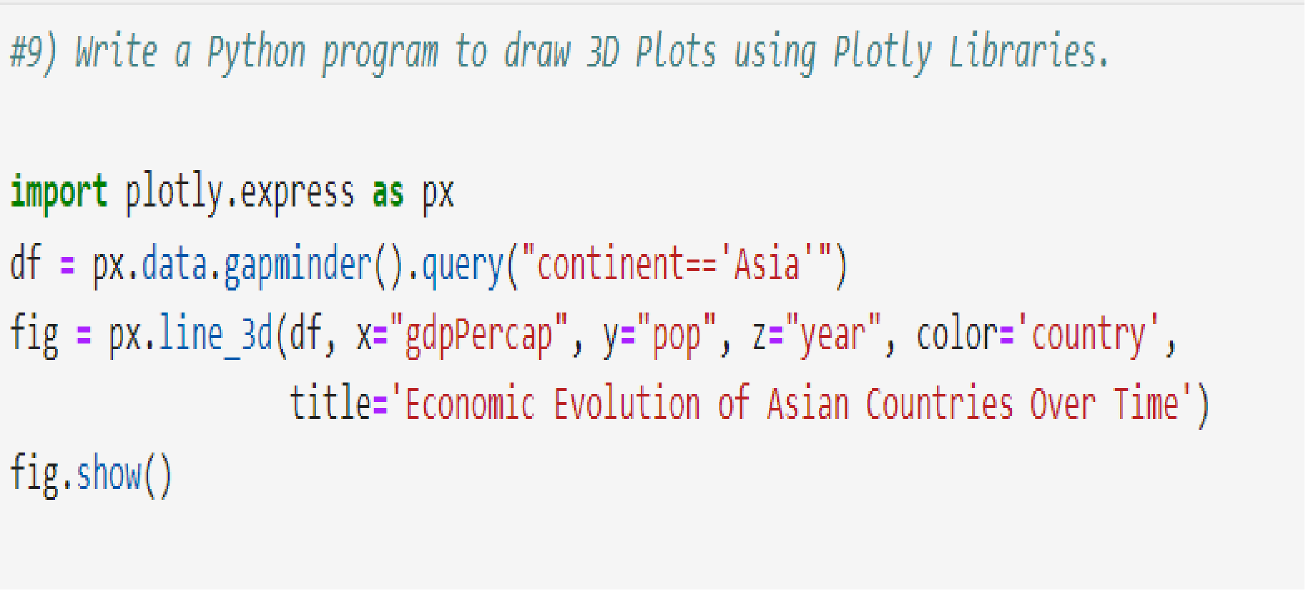
```
'''
7) Write a Python program which explains uses of customizing seaborn plots
   with Aesthetic functions.
'''
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

def sinplot(n=10):
    x = np.linspace(0, 14, 100)
    for i in range(1, n + 1):
        plt.plot(x, np.sin(x + i * .5) * (n + 2 - i))

sns.set_theme()
#sns.set_context("talk")
sns.set_context("notebook", font_scale=1.5, rc={"lines.linewidth": 2.5})

sinplot()
plt.title('Seaborn plots with Aesthetic functions')
plt.show()
```



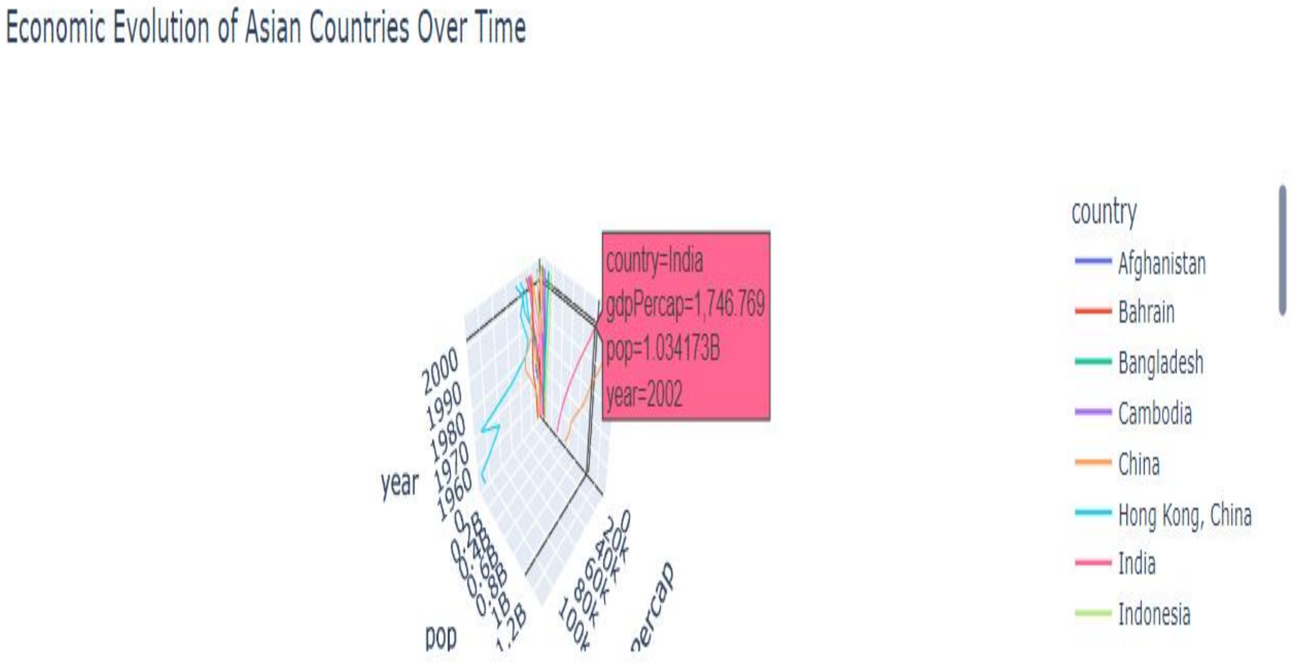


```
'''
8) Write a Python program to explain working with bokeh line graph using Annotations and Legends.
a) Write a Python program for plotting different types of plots using Bokeh.
'''
import numpy as np
from bokeh.layouts import gridplot
from bokeh.plotting import figure, show

x = np.linspace(0, 4*np.pi, 100)
y = np.sin(x)

TOOLS = "pan,wheel_zoom,box_zoom,reset,save,box_select"

p1 = figure(title="Example 1", tools=TOOLS)

p1.circle(x,   y, legend_label="sin(x)")
p1.circle(x, 2*y, legend_label="2*sin(x)", color="orange")
p1.circle(x, 3*y, legend_label="3*sin(x)", color="green")

p1.legend.title = 'Markers'

p2 = figure(title="Example 2", tools=TOOLS)

p2.circle(x, y, legend_label="sin(x)")
p2.line(x, y, legend_label="sin(x)")

p2.line(x, 2*y, legend_label="2*sin(x)",
        line_dash=(4, 4), line_color="orange", line_width=2)

p2.square(x, 3*y, legend_label="3*sin(x)", fill_color=None, line_color="green")
p2.line(x, 3*y, legend_label="3*sin(x)", line_color="green")

p2.legend.title = 'Lines'

show(gridplot([p1, p2], ncols=2, width=400, height=400))
```

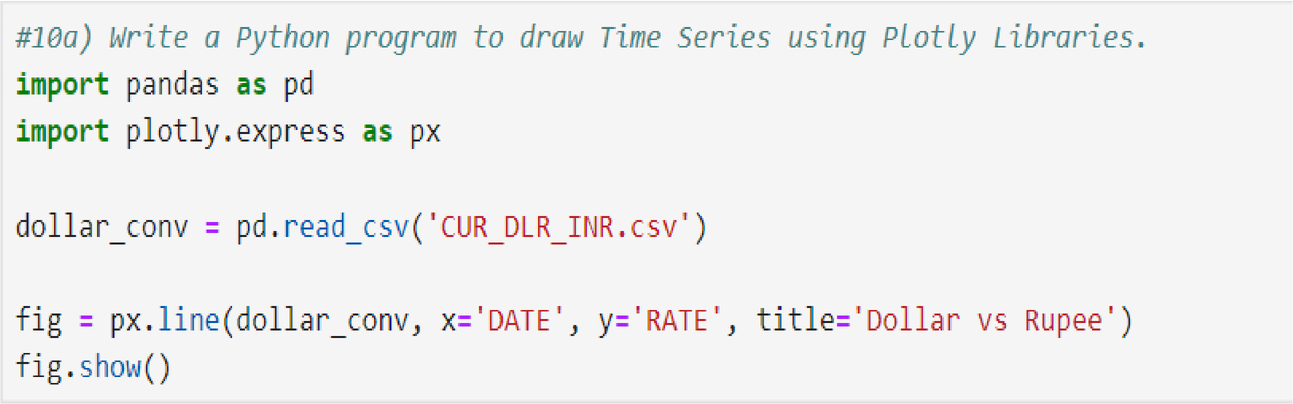




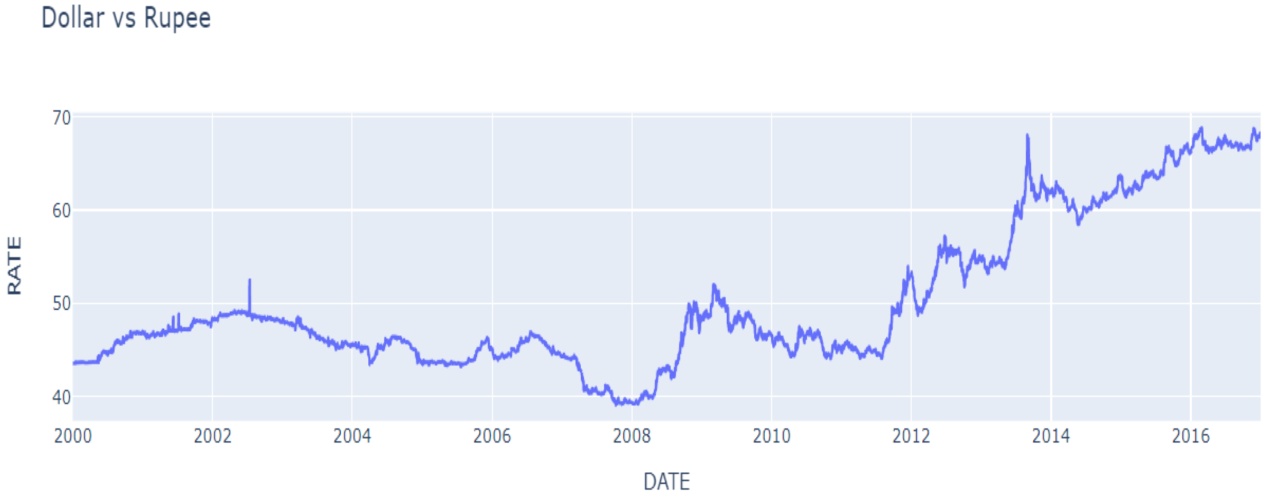
```
#9) Write a Python program to draw 3D Plots using Plotly Libraries.

import plotly.express as px
df = px.data.gapminder().query("continent=='Asia'")
fig = px.line_3d(df, x="gdpPercap", y="pop", z="year", color='country',
                 title='Economic Evolution of Asian Countries Over Time')
fig.show()
```

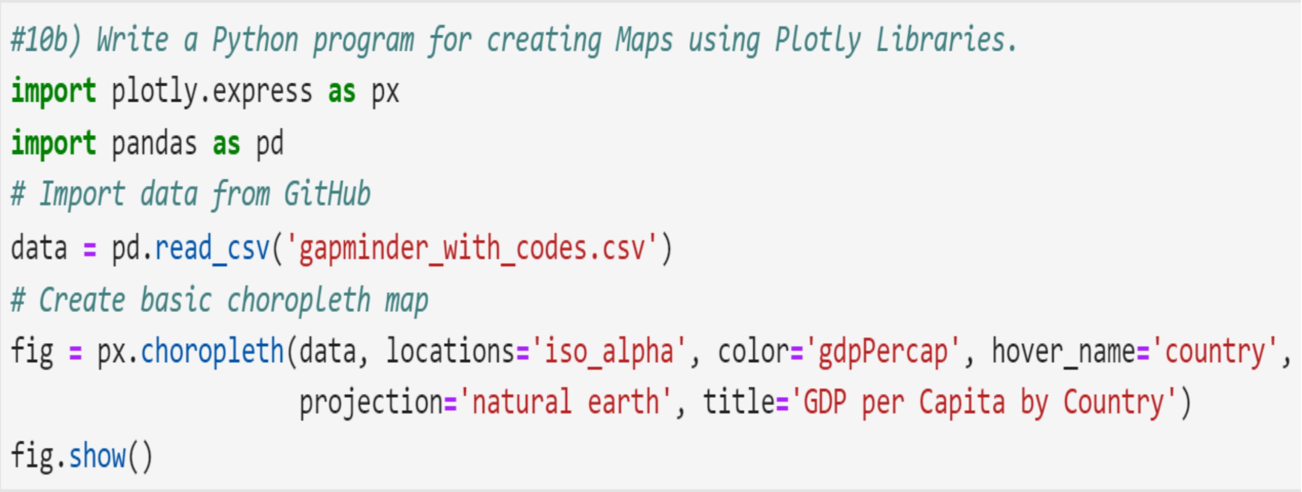


Economic Evolution of Asian Countries Over Time

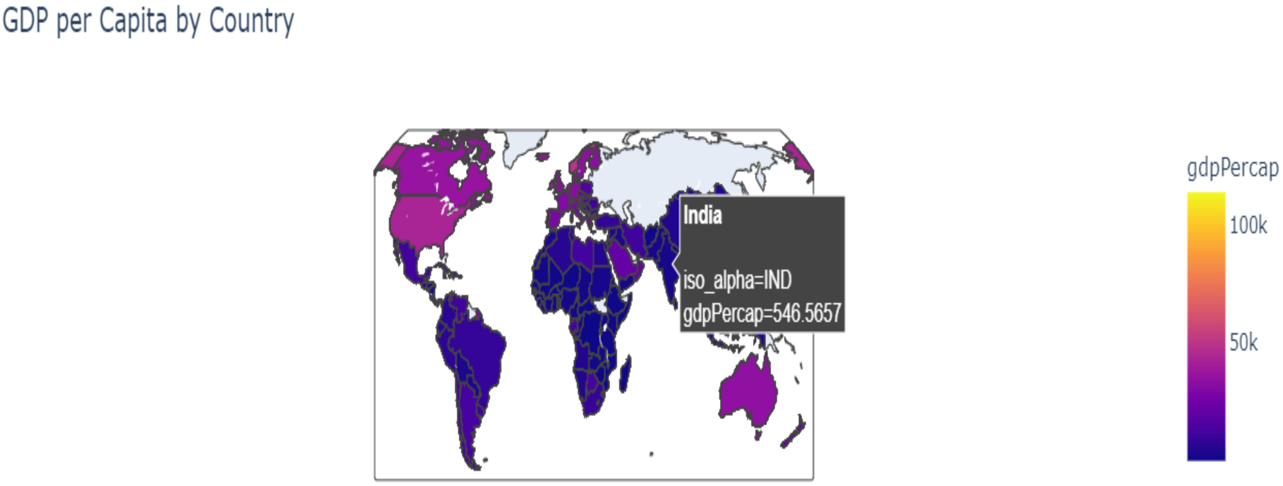


```
#10a) Write a Python program to draw Time Series using Plotly Libraries.
import pandas as pd
import plotly.express as px

dollar_conv = pd.read_csv('CUR_DLR_INR.csv')

fig = px.line(dollar_conv, x='DATE', y='RATE', title='Dollar vs Rupee')
fig.show()
```





```python
#10b) Write a Python program for creating Maps using Plotly Libraries.
import plotly.express as px
import pandas as pd
# Import data from GitHub
data = pd.read_csv('gapminder_with_codes.csv')
# Create basic choropleth map
fig = px.choropleth(data, locations='iso_alpha', color='gdpPercap', hover_name='country',
                    projection='natural earth', title='GDP per Capita by Country')
fig.show()
```


GDP per Capita by Country
India
iso_alpha=IND
gdpPercap=546.5657
gdpPercap
100k
50k