forestation-percent-of-country

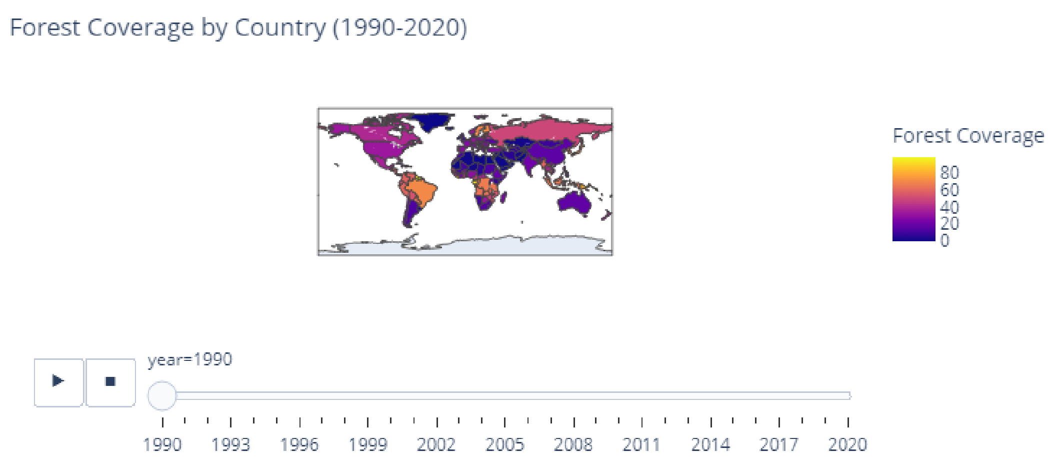
December 6, 2023

[5]:
```
!pip install mapclassify
!pip install pandas
!pip install plotly
```

[36]:
```
import pandas as pd
import plotly.express as px

# Read the dataset from a file
# df = pd.read_csv('/content/dataset/forest_percent_by_country.csv') # for␣
 ↪colabe
df = pd.read_csv('forest_percent_by_country.csv')
df
```

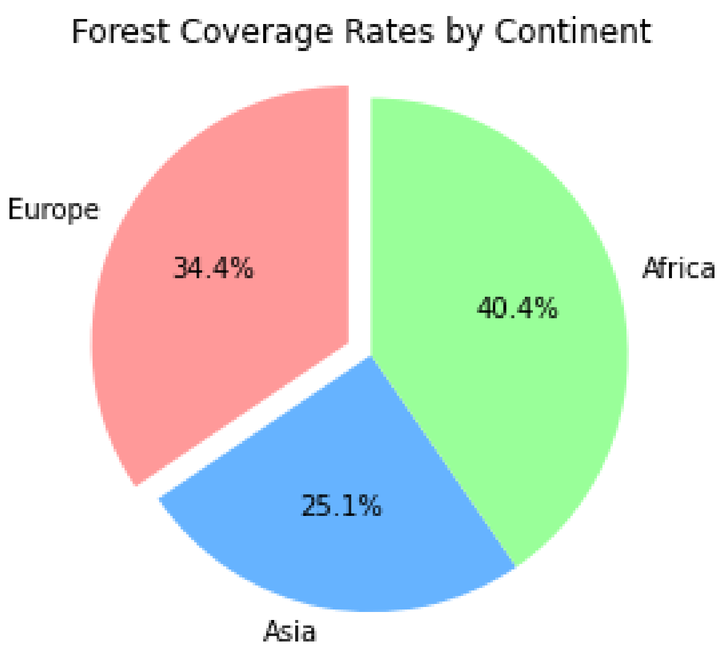
[36]:
```
     country_code country_name  year      value
0             ABW        Aruba  1990   2.333333
1             ABW        Aruba  1991   2.333333
2             ABW        Aruba  1992   2.333333
3             ABW        Aruba  1993   2.333333
4             ABW        Aruba  1994   2.333333
…             …           …    …         …
8038          ZWE     Zimbabwe  2016  45.570273
8039          ZWE     Zimbabwe  2017  45.451183
8040          ZWE     Zimbabwe  2018  45.332093
8041          ZWE     Zimbabwe  2019  45.213002
8042          ZWE     Zimbabwe  2020  45.093912

[8043 rows x 4 columns]
```

[15]:
```
# Create a choropleth map
fig = px.choropleth(df, locations='country_code', color='value',
                    hover_name='country_name', animation_frame='year',
                    title='Forest Coverage by Country (1990-2020)',
                    labels={'value': 'Forest Coverage'})

fig.show()
```



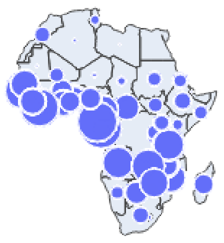
```
[16]: import pandas as pd
      import matplotlib.pyplot as plt
      # Filter data for European, Asian, and African countries
      europe_countries = ['Russia', 'Germany', 'United Kingdom', 'France', 'Italy',␣
        ↪'Spain', 'Ukraine', 'Poland',
                           'Romania', 'Netherlands', 'Belgium', 'Greece', 'Portugal',␣
        ↪'Czech Republic', 'Hungary',
                           'Sweden', 'Austria', 'Bulgaria', 'Denmark', 'Finland',␣
        ↪'Slovakia', 'Norway', 'Ireland',
                           'Croatia', 'Moldova', 'Bosnia and Herzegovina', 'Albania',␣
        ↪'Lithuania', 'North Macedonia',
                           'Slovenia', 'Latvia', 'Estonia', 'Montenegro',␣
        ↪'Luxembourg', 'Malta', 'Iceland',
                           'Andorra', 'Liechtenstein', 'Monaco', 'San Marino',␣
        ↪'Vatican City']

      asia_countries = ['China', 'India', 'Indonesia', 'Pakistan', 'Bangladesh',␣
        ↪'Japan', 'Philippines', 'Vietnam',
                         'Turkey', 'Iran', 'Thailand', 'Myanmar', 'South Korea',␣
        ↪'Iraq', 'Afghanistan', 'Saudi Arabia',
                         'Uzbekistan', 'Malaysia', 'Yemen', 'Nepal', 'North Korea',␣
        ↪'Sri Lanka', 'Kazakhstan', 'Syria',
                         'Cambodia', 'Jordan', 'Azerbaijan', 'United Arab Emirates',␣
        ↪'Tajikistan', 'Israel',
                         'Laos', 'Lebanon', 'Kyrgyzstan', 'Turkmenistan', 'Singapore',␣
        ↪'Oman', 'State of Palestine',
                         'Kuwait', 'Georgia', 'Mongolia', 'Armenia', 'Qatar',␣
        ↪'Bahrain', 'Timor-Leste', 'Cyprus',
                         'Bhutan', 'Maldives', 'Brunei']
```

```
africa_countries = ['Nigeria', 'Ethiopia', 'Egypt', 'Democratic Republic of the␣
 ↪Congo', 'South Africa', 'Tanzania',
                    'Kenya', 'Uganda', 'Algeria', 'Sudan', 'Morocco', 'Angola',␣
 ↪'Mozambique', 'Ghana', 'Madagascar',
                    'Cameroon', 'Côte d\'Ivoire', 'Niger', 'Burkina Faso',␣
 ↪'Mali', 'Malawi', 'Zambia', 'Senegal',
                    'Chad', 'Somalia', 'Zimbabwe', 'Guinea', 'Rwanda', 'Benin',␣
 ↪'Tunisia', 'Burundi', 'South Sudan',
                    'Togo', 'Sierra Leone', 'Libya', 'Congo', 'Liberia',␣
 ↪'Central African Republic', 'Mauritania',
                    'Eritrea', 'Namibia', 'Gambia', 'Botswana', 'Gabon',␣
 ↪'Lesotho', 'Guinea-Bissau', 'Equatorial Guinea',
                    'Mauritius', 'Eswatini', 'Djibouti', 'Comoros', 'Cabo␣
 ↪Verde', 'Sao Tome and Principe']

df_europe = df[df['country_name'].isin(europe_countries)]
df_asia = df[df['country_name'].isin(asia_countries)]
df_africa = df[df['country_name'].isin(africa_countries)]

# Calculate the total forest coverage for each continent
total_forest_coverage_europe = df_europe['value'].sum()
total_forest_coverage_asia = df_asia['value'].sum()
total_forest_coverage_africa = df_africa['value'].sum()

# Create a pie chart
labels = ['Europe', 'Asia', 'Africa']
sizes = [total_forest_coverage_europe, total_forest_coverage_asia,␣
 ↪total_forest_coverage_africa]
colors = ['#ff9999', '#66b3ff', '#99ff99']
explode = (0.1, 0, 0)  # explode the 1st slice (Europe)

plt.pie(sizes, explode=explode, labels=labels, colors=colors, autopct='%1.
 ↪1f%%', startangle=90)
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a circle.
plt.title('Forest Coverage Rates by Continent')

plt.show()
```



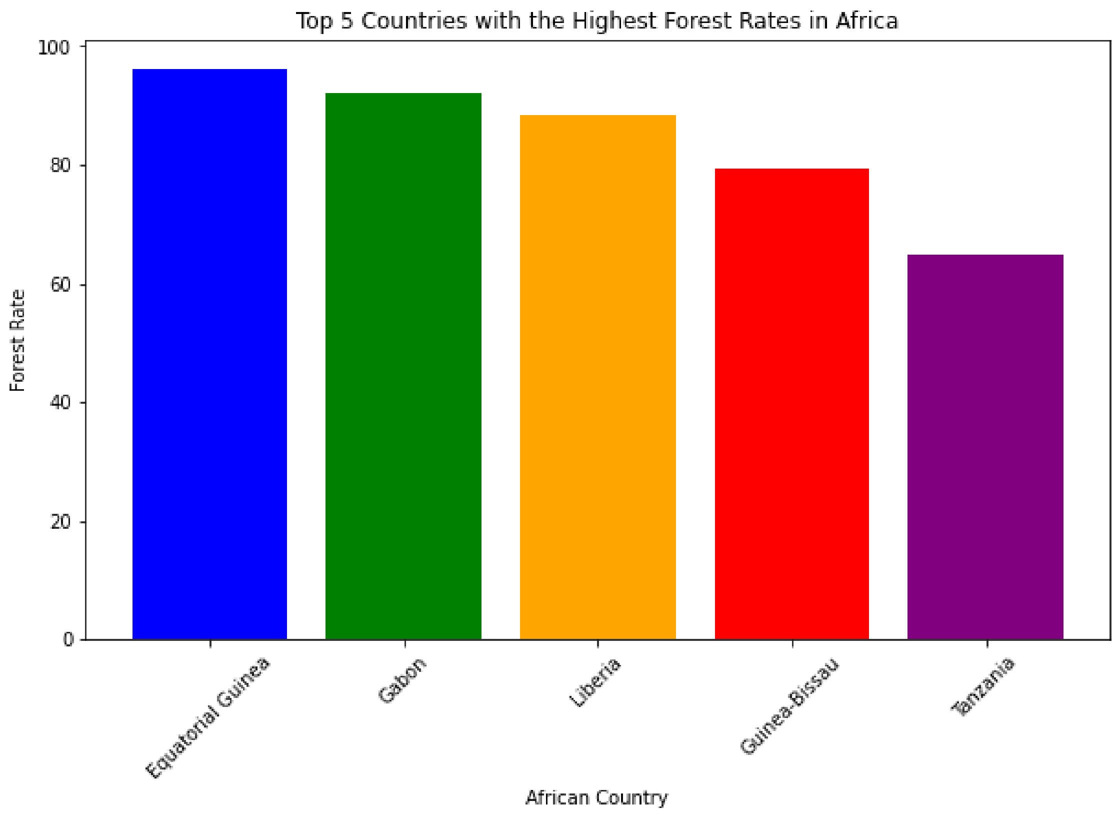
[17]:
```
import pandas as pd
import plotly.express as px

africa_df = df[df['country_name'].isin(africa_countries)]

# Create a scatter plot for forest coverage in Africa
fig = px.scatter_geo(africa_df, locations='country_name', locationmode='country␣
 ↪names',
                     hover_name='country_name', size='value',
                     title='Forest Coverage in Africa',
                     labels={'value': 'Forest Coverage'},
                     color_continuous_scale='greens')

fig.update_layout(geo=dict(scope='africa', showframe=False,␣
 ↪showcoastlines=False))

fig.show()
```

Forest Coverage in Africa



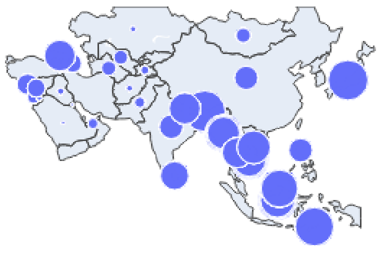
[18]:
```
colors_matplotlib = ['blue', 'green', 'orange', 'red', 'purple']
# Convert 'year' column to string to concatenate with the result
df_africa['year'] = df_africa['year'].astype(str)

# Group by country and find the row with the maximum value
max_forest_rates_africa = df_africa.loc[df_africa.
  ↪groupby('country_code')['value'].idxmax()]

# Sort the data by forest rates in descending order and select the top 5
top_5_countries = max_forest_rates_africa.sort_values(by='value',␣
  ↪ascending=False).head(5)

# Plotting the bar chart for the top 5 countries
plt.figure(figsize=(10, 6))
plt.bar(top_5_countries['country_name'], top_5_countries['value'],␣
  ↪color=colors_matplotlib)
plt.xlabel('African Country')
plt.ylabel('Forest Rate')
plt.title('Top 5 Countries with the Highest Forest Rates in Africa')
plt.xticks(rotation=45)
plt.show()
```

```
/tmp/ipykernel_302/1926254666.py:3: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```



[19]:
```
import pandas as pd
import plotly.express as px

asia_df = df[df['country_name'].isin(asia_countries)]
# Create a scatter plot for forest coverage in Asia
fig = px.scatter_geo(asia_df, locations='country_name', locationmode='country␣
 ↪names',
                     hover_name='country_name', size='value',
                     title='Forest Coverage in Asia',
                     labels={'value': 'Forest Coverage'},
                     color_continuous_scale='greens')

fig.update_layout(geo=dict(scope='asia', showframe=False, showcoastlines=False))

fig.show()
```

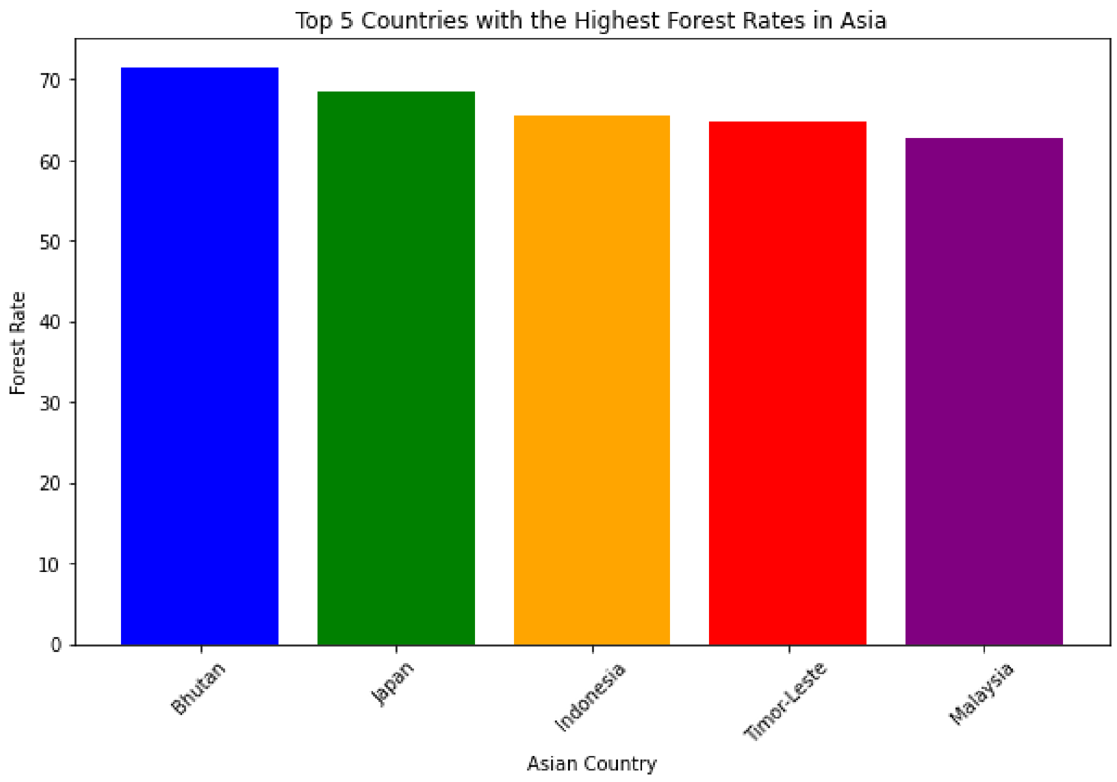
Forest Coverage in Asia



```
[20]: #barchart asia
import pandas as pd
import matplotlib.pyplot as plt


# Convert 'year' column to string to concatenate with the result
df_asia['year'] = df_asia['year'].astype(str)

# Group by country and find the row with the maximum value
max_forest_rates_asia = df_asia.loc[df_asia.groupby('country_code')['value'].
 ↪idxmax()]

# Sort the data by forest rates in descending order and select the top 5
top_5_countries_asia = max_forest_rates_asia.sort_values(by='value',␣
 ↪ascending=False).head(5)

# Plotting the bar chart for the top 5 Asian countries
plt.figure(figsize=(10, 6))
plt.bar(top_5_countries_asia['country_name'],␣
 ↪top_5_countries_asia['value'],color=colors_matplotlib)
plt.xlabel('Asian Country')
plt.ylabel('Forest Rate')
plt.title('Top 5 Countries with the Highest Forest Rates in Asia')
plt.xticks(rotation=45)
plt.show()
```

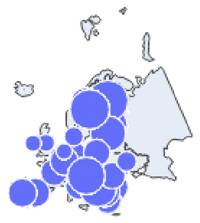
```
/tmp/ipykernel_302/3115414831.py:7: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
```

```
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```

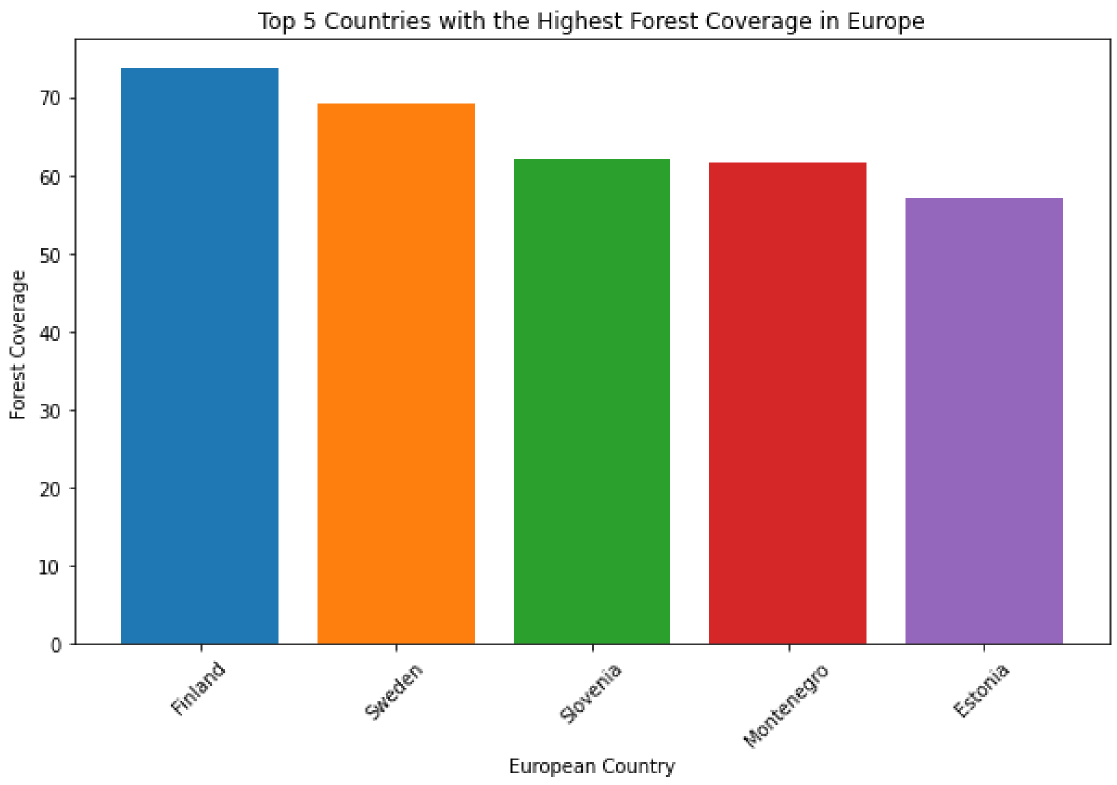


```
[21]: import pandas as pd
      import plotly.express as px

      europe_df = df[df['country_name'].isin(europe_countries)]
      # Create a scatter plot for forest coverage in Europe
      fig = px.scatter_geo(europe_df, locations='country_name', locationmode='country␣
       ↪names',
                           hover_name='country_name', size='value',
                           title='Forest Coverage in Europe',
                           labels={'value': 'Forest Coverage'},
                           color_continuous_scale='greens')

      fig.update_layout(geo=dict(scope='europe', showframe=False,␣
       ↪showcoastlines=False))

      fig.show()
```

Forest Coverage in Europe



```
[22]: import itertools

# Group by country and find the row with the maximum value
max_forest_rates_europe = df_europe.loc[df_europe.
 ↪groupby('country_code')['value'].idxmax()]

# Sort the data by forest rates in descending order and select the top 5
top_5_countries_europe = max_forest_rates_europe.sort_values(by='value',␣
 ↪ascending=False).head(5)

# Get Plotly's Pastel color palette
colors_plotly = px.colors.qualitative.Pastel

# Create an iterator to cycle through the default Matplotlib colors
color_cycle = itertools.cycle(plt.rcParams['axes.prop_cycle'].by_key()['color'])

# Convert Plotly colors to Matplotlib colors
colors_matplotlib = [next(color_cycle) for _ in range(len(colors_plotly))]

# Plotting the bar chart for the top 5 European countries
plt.figure(figsize=(10, 6))
plt.bar(top_5_countries_europe['country_name'],␣
 ↪top_5_countries_europe['value'], color=colors_matplotlib)
plt.xlabel('European Country')
plt.ylabel('Forest Coverage')
plt.title('Top 5 Countries with the Highest Forest Coverage in Europe')
plt.xticks(rotation=45)
plt.show()
```



1 Reference

- https://matplotlib.org/stable/users/index.html
- https://pandas.pydata.org/pandas-docs/stable/
- https://plotly.com/python/plotly-express/