```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
import plotly.graph_objects as go
```

```
data_path = '/content/Amazon Sales data.csv'
df = pd.read_csv(data_path)
df
```

	Region	Country	Item Type	Sales Channel	Order Priority	Order Date	Order ID	Ship Date	Units Sold
0	Australia and Oceania	Tuvalu	Baby Food	Offline	H	5/28/2010	669165933	6/27/2010	9925
1	Central America and the Caribbean	Grenada	Cereal	Online	C	8/22/2012	963881480	9/15/2012	2804
2	Europe	Russia	Office Supplies	Offline	L	05-02-2014	341417157	05-08-2014	1779
3	Sub-Saharan Africa	Sao Tome and Principe	Fruits	Online	C	6/20/2014	514321792	07-05-2014	8102
4	Sub-Saharan Africa	Rwanda	Office Supplies	Offline	L	02-01-2013	115456712	02-06-2013	5062
...	...	...	...	...	...	...	...	...	...
95	Sub-Saharan Africa	Mali	Clothes	Online	M	7/26/2011	512878119	09-03-2011	888
96	Asia	Malaysia	Fruits	Offline	L	11-11-2011	810711038	12/28/2011	6267
97	Sub-Saharan Africa	Sierra Leone	Vegetables	Offline	C	06-01-2016	728815257	6/29/2016	1485
98	North America	Mexico	Personal Care	Offline	M	7/30/2015	559427106	08-08-2015	5767
99	Sub-Saharan Africa	Mozambique	Household	Offline	L	02-10-2012	665095412	2/15/2012	5367

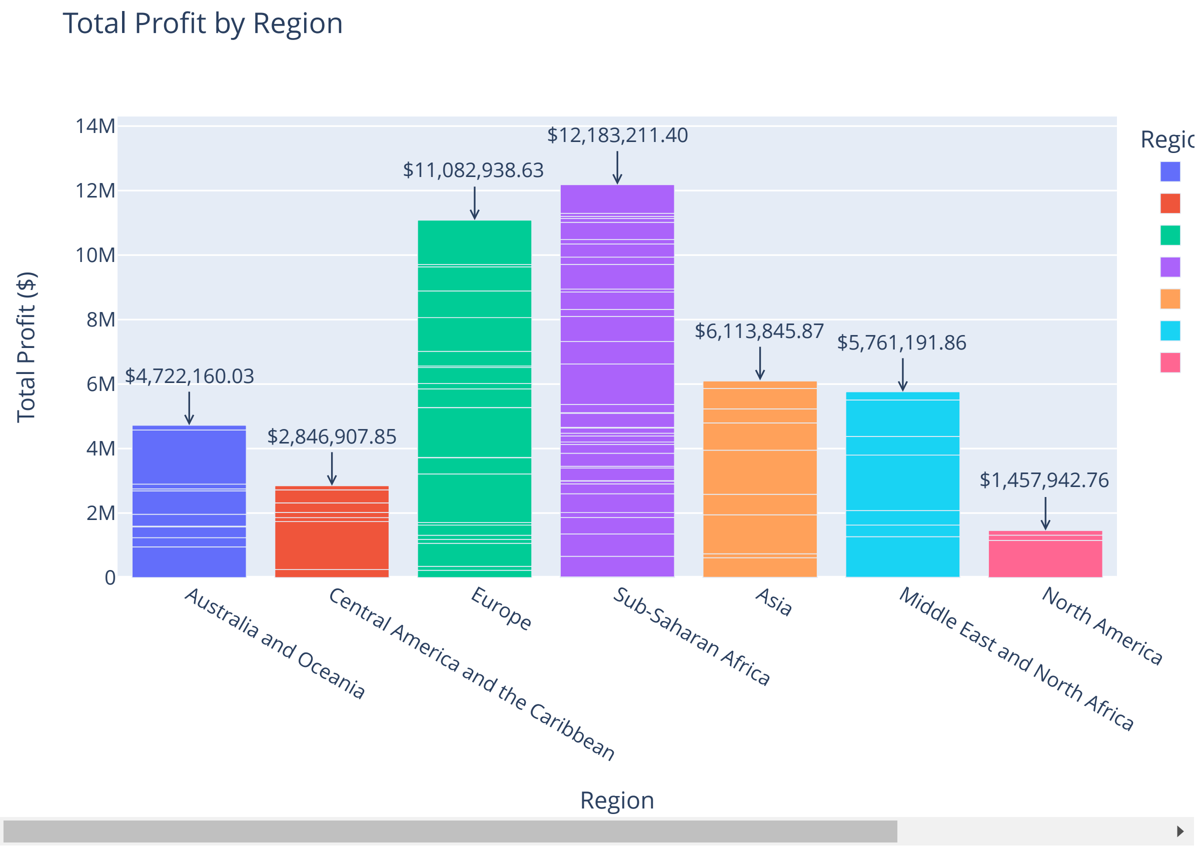
100 rows × 14 columns

Next steps: Generate code with df View recommended plots

```
df.info()
```

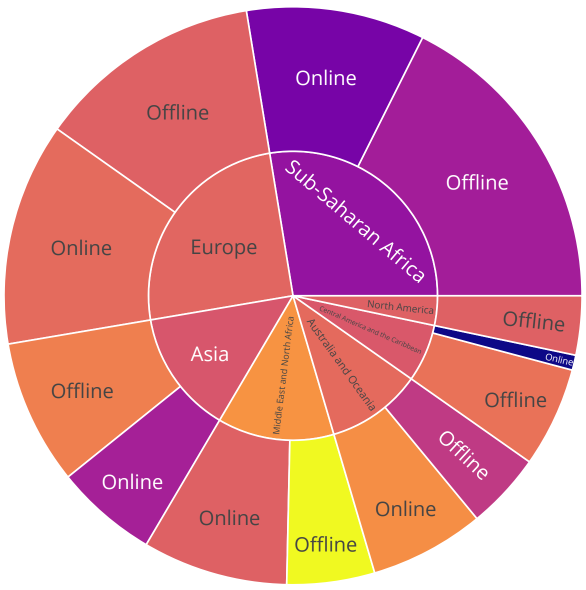
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 14 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Region          100 non-null    object
 1   Country         100 non-null    object
 2   Item Type       100 non-null    object
 3   Sales Channel   100 non-null    object
 4   Order Priority  100 non-null    object
 5   Order Date      100 non-null    object
 6   Order ID        100 non-null    int64
 7   Ship Date       100 non-null    object
 8   Units Sold      100 non-null    int64
 9   Unit Price      100 non-null    float64
 10  Unit Cost       100 non-null    float64
 11  Total Revenue   100 non-null    float64
 12  Total Cost      100 non-null    float64
 13  Total Profit    100 non-null    float64
dtypes: float64(5), int64(2), object(7)
memory usage: 11.1+ KB
```

```
# Bar plot for Region vs Total Profit
total_profit_by_region = df.groupby('Region')['Total Profit'].sum().reset_index()

fig = px.bar(df, x='Region', y='Total Profit', color='Region', title='Total Profit by Region',
             labels={'Total Profit': 'Total Profit ($)'})
for region, total_profit in zip(total_profit_by_region['Region'], total_profit_by_region['Total Profit']):
    fig.add_annotation(x=region,y=total_profit,text=f'${total_profit:,.2f}',
        arrowhead=5, ax=0,ay=-30)
fig.show()
```



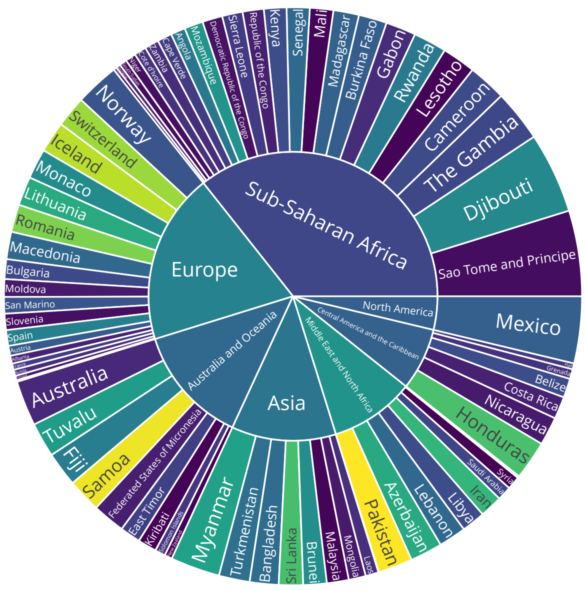
```
fig_sunburst = px.sunburst(df, path=['Region', 'Sales Channel'], values='Total Profit',
                           title='Profit based on Sales Channel and Region',
                           labels={'Total Profit': 'Total Profit ($)'},
                           color='Total Profit')
fig_sunburst.show()
```

Profit based on Sales Channel and Region



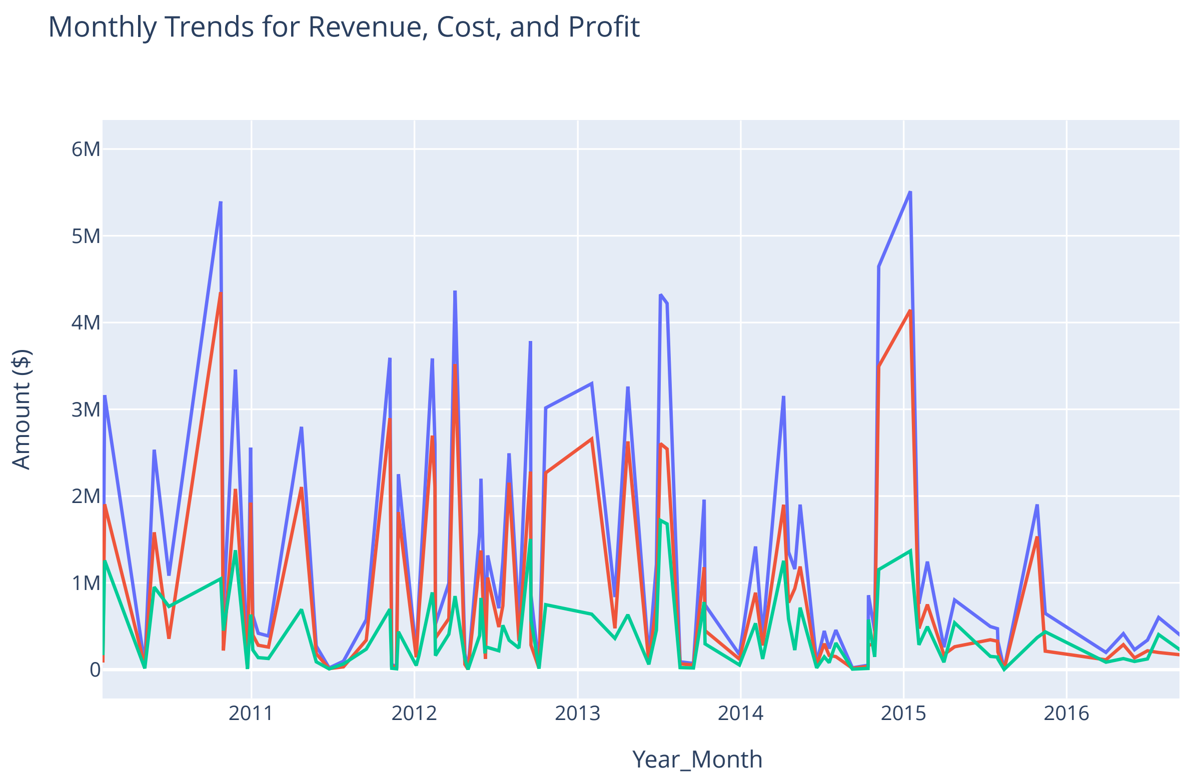
```
fig_sunburst = px.sunburst(df, path=['Region', 'Country'], values='Units Sold',
                           title='Profit by Country and Region',
                           labels={'Total Profit': 'Total Profit ($)'},
                           color='Total Profit',color_continuous_scale='Viridis')
fig_sunburst.show()
```

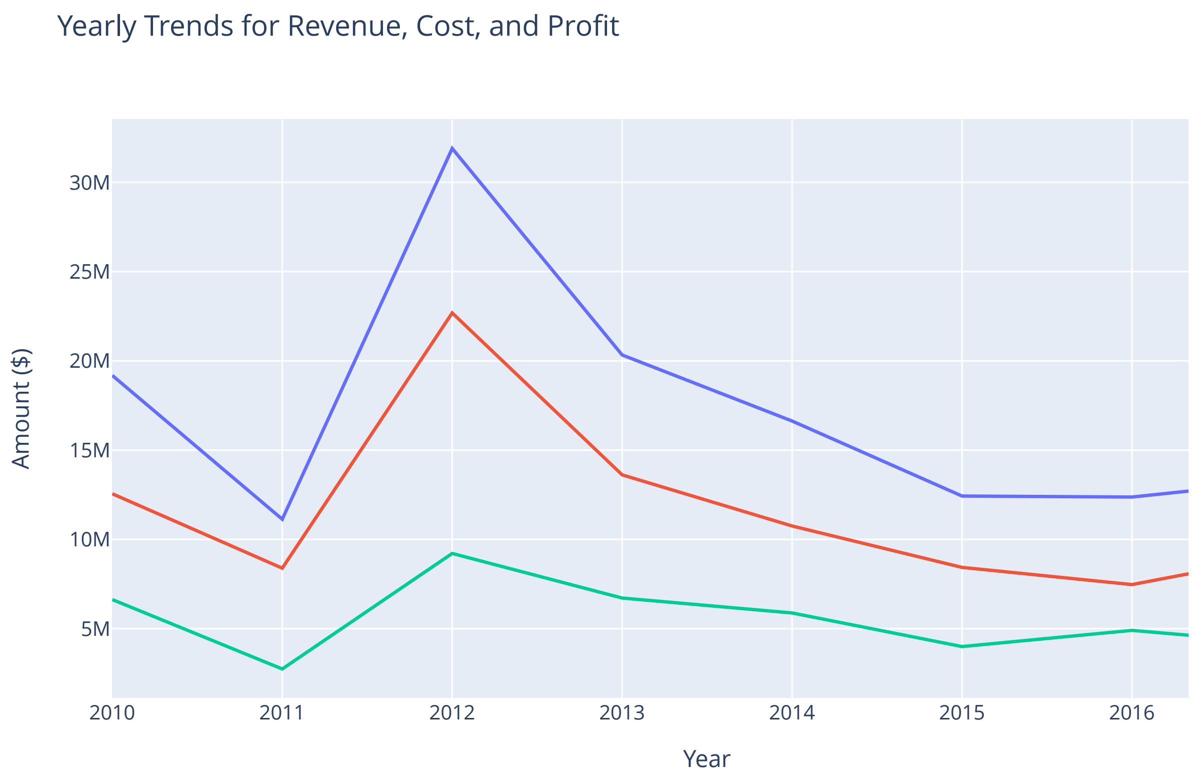
Profit by Country and Region

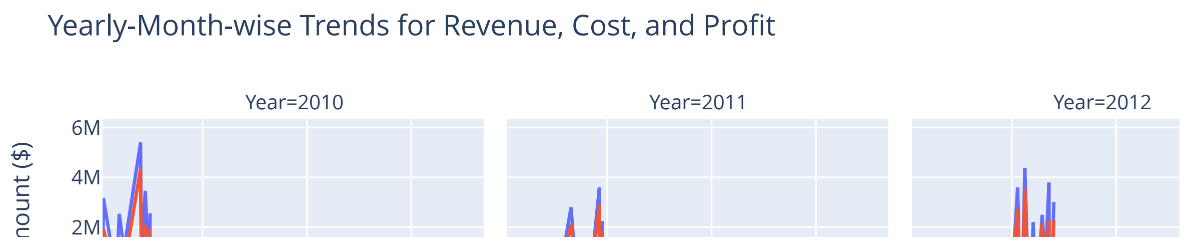


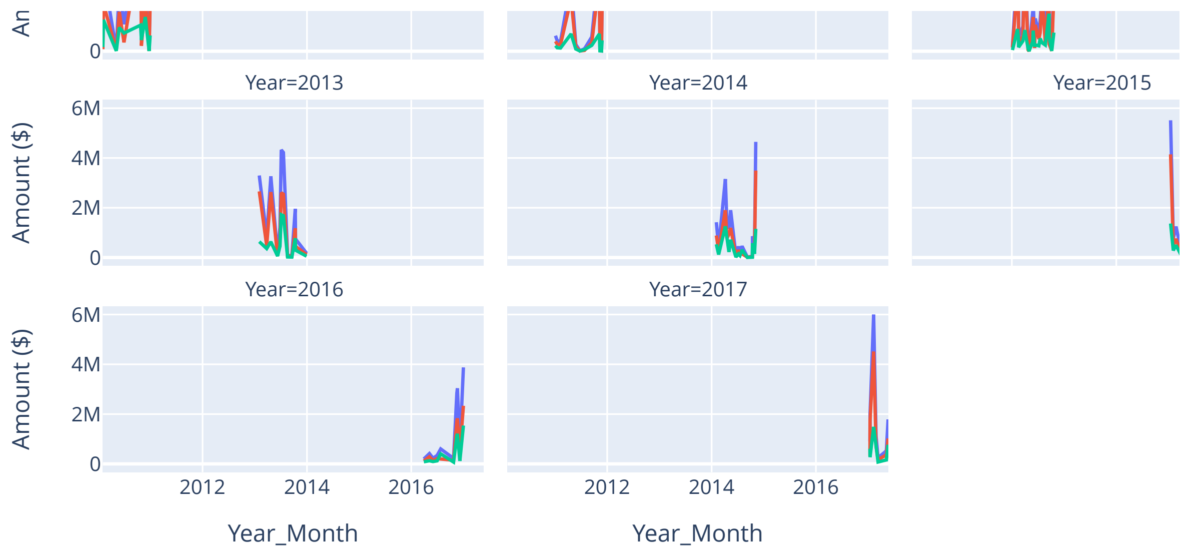
```
df['Order Date'] = pd.to_datetime(df['Order Date'])

# Extract Year, Month, and Year-Month from 'Order Date'
df['Year'] = df['Order Date'].dt.year
df['Month'] = df['Order Date'].dt.month
df['Year_Month'] = df['Order Date'].dt.to_period('M')
df['Year_Month'] = df['Order Date'].astype(str)

# Group by Year, Month, and Year-Month and calculate sum for each metric
monthly_trends = df.groupby(['Year', 'Month', 'Year_Month']).agg({'Total Revenue': 'sum','Total Cost': 'sum',
    'Total Profit': 'sum'}).reset_index()

# Monthly Trends Line Chart
fig_monthly = px.line(monthly_trends, x='Year_Month', y=['Total Revenue', 'Total Cost', 'Total Profit'],
                      title='Monthly Trends for Revenue, Cost, and Profit',
                      labels={'value': 'Amount ($)'},
                      line_shape='linear', render_mode='svg')

# Yearly Trends Line Chart
fig_yearly = px.line(monthly_trends.groupby('Year').sum().reset_index(),
                     x='Year', y=['Total Revenue', 'Total Cost', 'Total Profit'],
                     title='Yearly Trends for Revenue, Cost, and Profit',
                     labels={'value': 'Amount ($)'},
                     line_shape='linear', render_mode='svg')

# Yearly-Month-wise Trends Line Chart
fig_yearly_monthly = px.line(monthly_trends, x='Year_Month', y=['Total Revenue', 'Total Cost', 'Total Profit'],
                             facet_col='Year', facet_col_wrap=3,
                             title='Yearly-Month-wise Trends for Revenue, Cost, and Profit',
                             labels={'value': 'Amount ($)'},
                             line_shape='linear', render_mode='svg')
# Show the plots
fig_monthly.show()
fig_yearly.show()
fig_yearly_monthly.show()
```

```
<ipython-input-167-a4c784d7b8c1>:20: FutureWarning:

The default value of numeric_only in DataFrameGroupBy.sum is deprecated. In a future version,
```

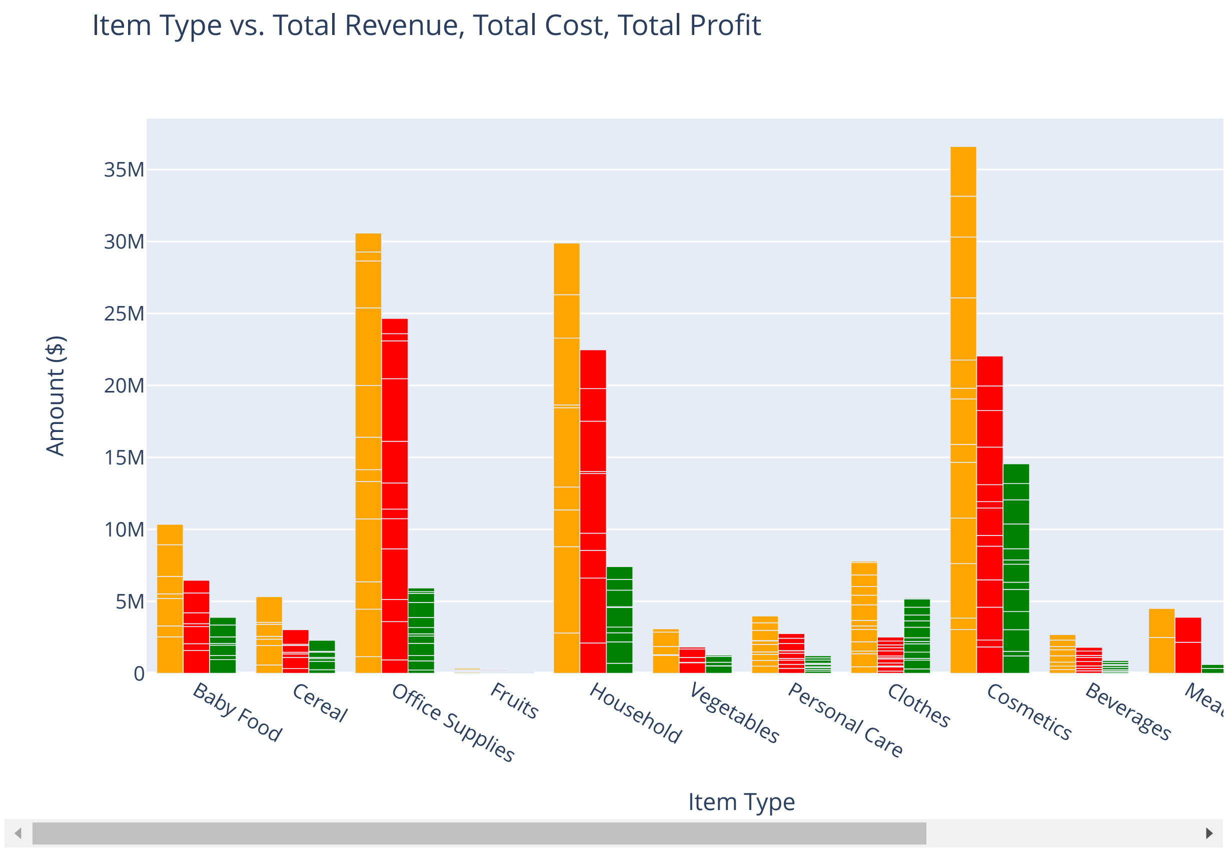




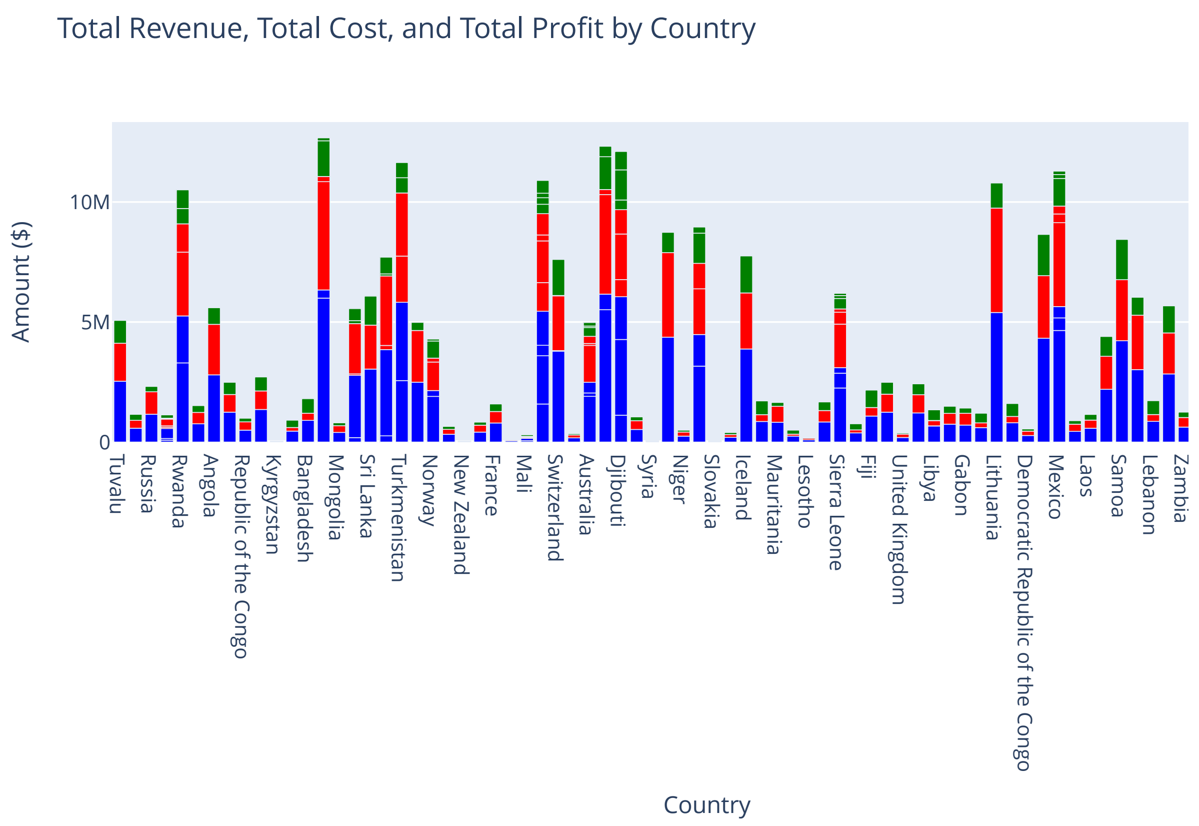


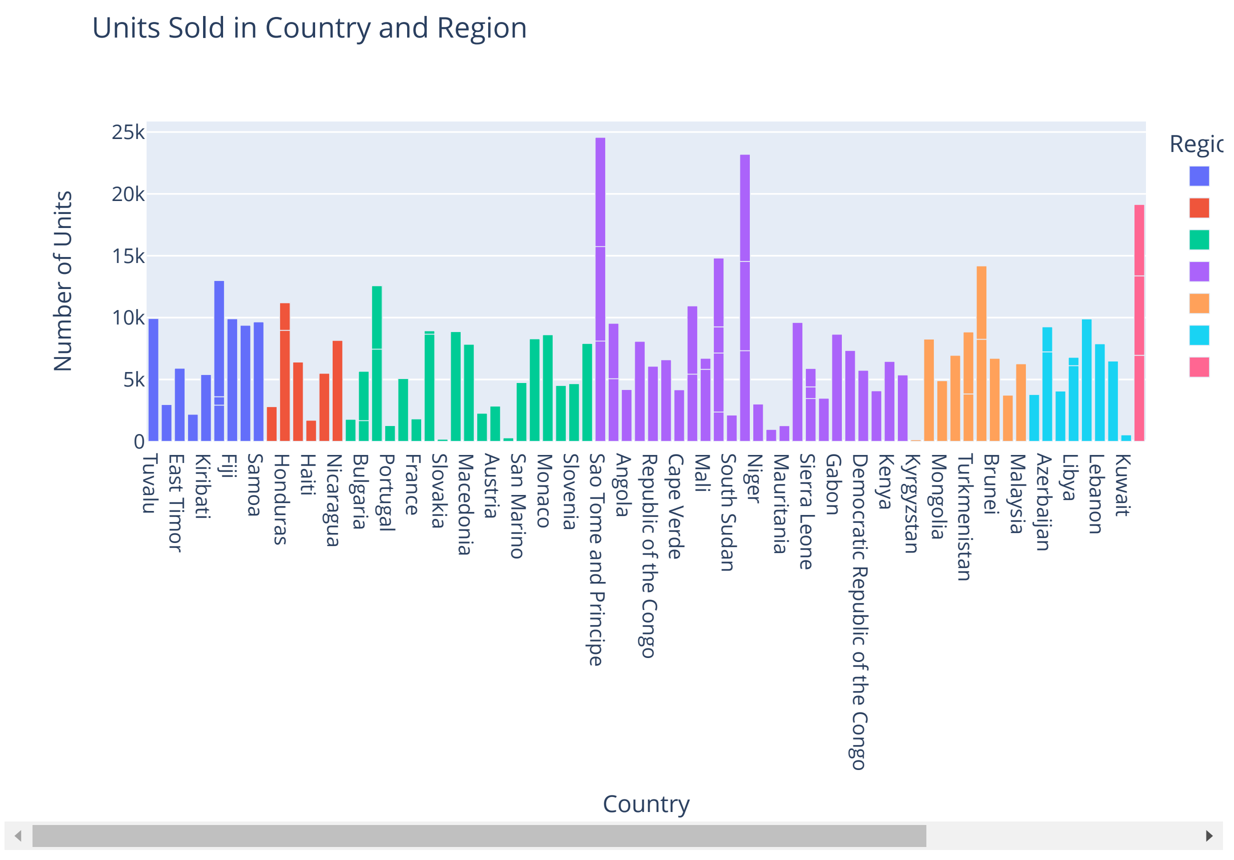


```
# Different item types in terms of revenue, cost, and profit
fig = px.bar(df, x='Item Type', y=['Total Revenue', 'Total Cost', 'Total Profit'],
             title='Item Type vs. Total Revenue, Total Cost, Total Profit',
             labels={'value': 'Amount ($)'},
             color_discrete_map={'Total Revenue': 'Orange', 'Total Cost': 'red', 'Total Profit': 'Green'})

fig.update_layout(barmode='group')
fig.show()
```

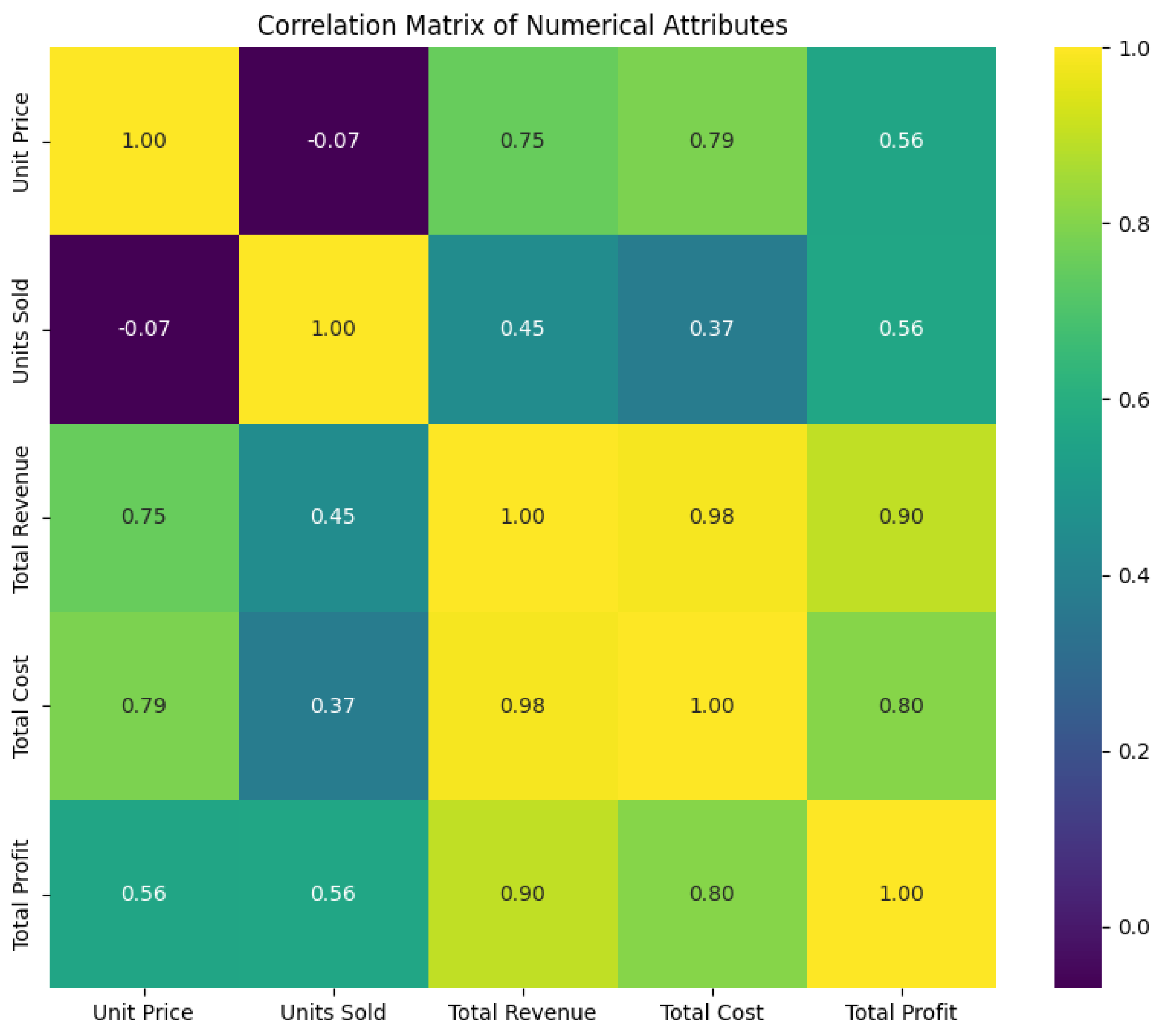


```
# Key Metrics

fig1 = px.bar(df, x='Country', y=['Total Revenue', 'Total Cost', 'Total Profit'],
              title='Total Revenue, Total Cost, and Total Profit by Country',labels={'value': 'Amount ($)'},
              color_discrete_map={'Total Revenue': 'blue', 'Total Cost': 'red', 'Total Profit': 'green'})

# Units Sold in Country and Region
fig_units_sold = px.bar(df, x='Country', y='Units Sold', color='Region',
title='Units Sold in Country and Region',
                        labels={'Units Sold': 'Number of Units'})
fig1.show()
fig_units_sold.show()
```





```
# Correlation between numerical attributes
numerical_attributes = ['Unit Price', 'Units Sold', 'Total Revenue', 'Total Cost', 'Total Profit']
correlation_matrix = df[numerical_attributes].corr()

# Create a heatmap using Seaborn
plt.figure(figsize=(10, 8))
sns.heatmap(correlation_matrix, annot=True, cmap='viridis', fmt=".2f")
plt.title('Correlation Matrix of Numerical Attributes')
plt.show()
```



```
!pip install nbconvert
!apt-get install pandoc
```

```
    Requirement already satisfied: nbconvert in /usr/local/lib/python3.10/dist-packages (6.5.4)
    Requirement already satisfied: lxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.9.4)
    Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.12.3)
    Requirement already satisfied: bleach in /usr/local/lib/python3.10/dist-packages (from nbconvert) (6.1.0)
    Requirement already satisfied: defusedxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.7.1)
    Requirement already satisfied: entrypoints>=0.2.2 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.4
```