

Q14. Create a multiple plots using matplotlib. To check the coorelation hitmap, pairwise relationship, temperature and rainfall over time

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

# Generate date range
data_range = pd.date_range(start='2023-01-01', end='2023-12-31', freq='D')

# Set seed for reproducibility
np.random.seed(0)

# Generate random data
temperature = np.random.normal(loc=10, scale=5, size=len(data_range))
humidity = np.random.uniform(60, 90, size=len(data_range))
wind_speed = np.random.uniform(5, 20, size=len(data_range))
rainfall = np.random.exponential(scale=2, size=len(data_range))

# Create DataFrame
df = pd.DataFrame({
    'Date': data_range,
    'Temperature (°C)': temperature,
    'Humidity (%)': humidity,
    'Wind Speed (km/h)': wind_speed,
    'Rainfall (mm)': rainfall
})

# Save to CSV
df.to_csv('weather_data.csv', index=False)
print("Sample weather dataset 'weather_data.csv' created successfully!")
```

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

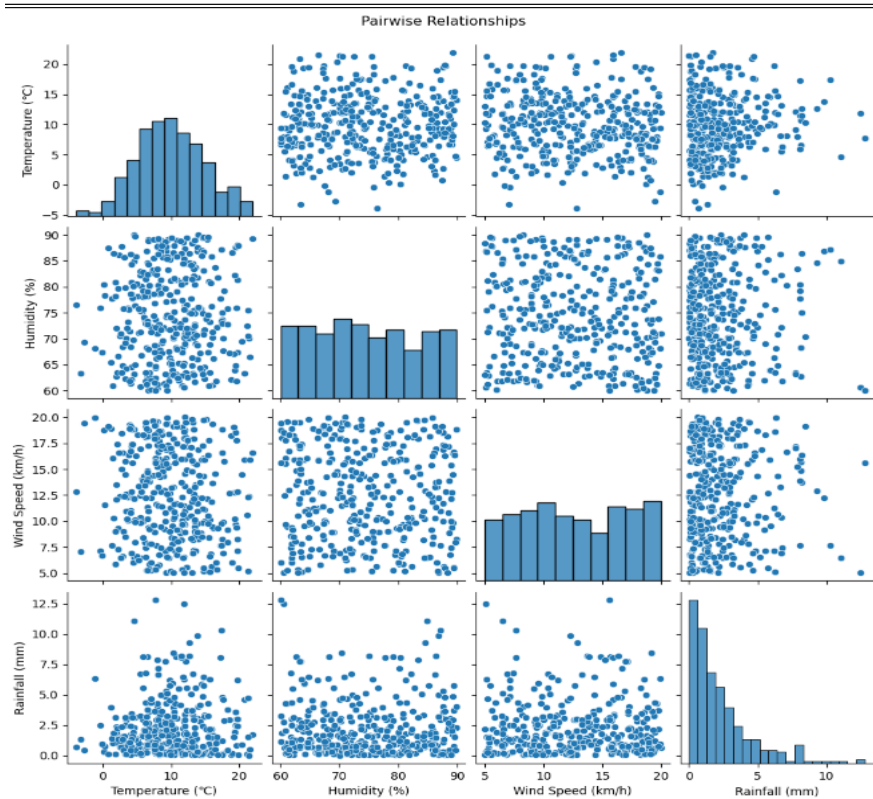
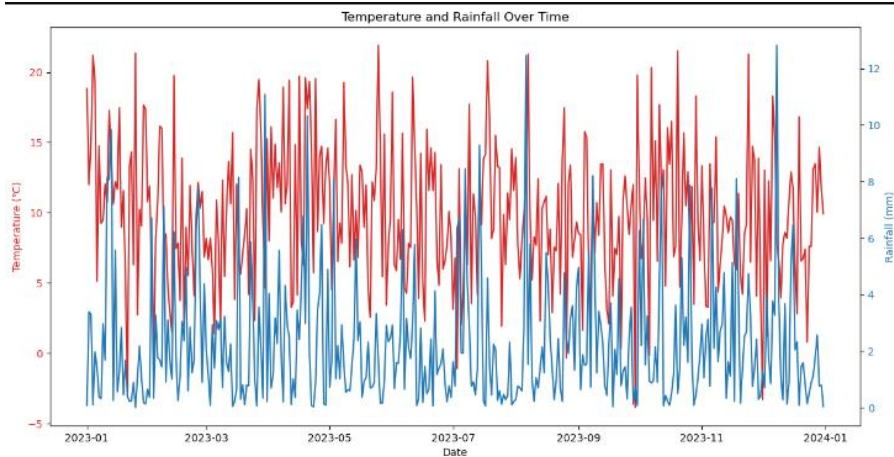
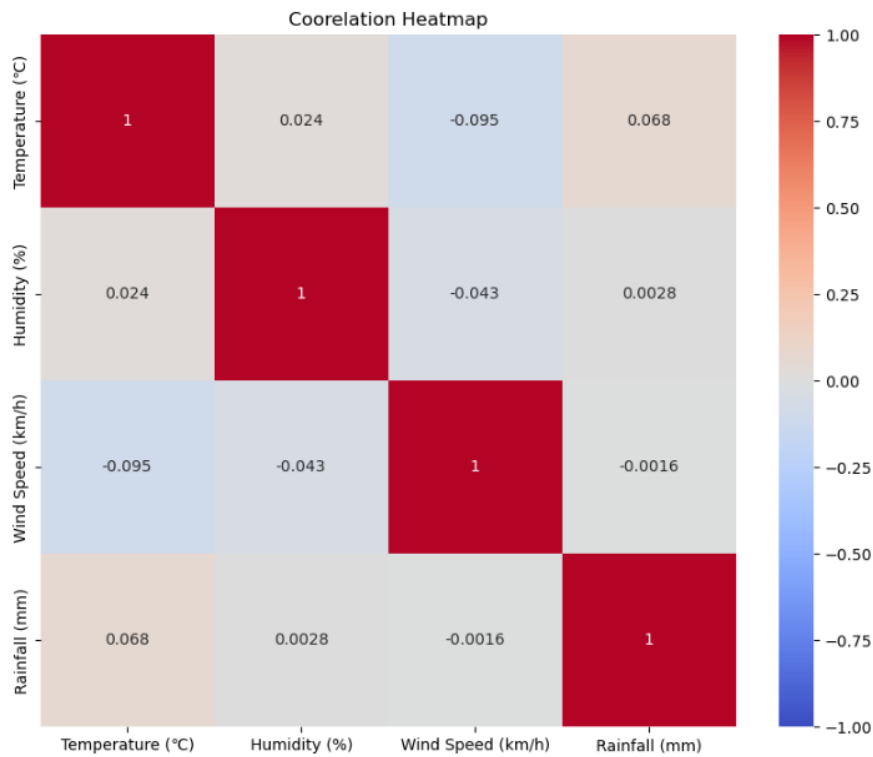
df = pd.read_csv('weather_data.csv')
df['Date'] = pd.to_datetime(df['Date'])
df.set_index('Date', inplace=True)
df.ffill(inplace=True)

correlation_matrix = df.corr()

plt.figure(figsize=(10,8))
sns.heatmap(correlation_matrix,annot=True,cmap='coolwarm',vmin=-1,vmax=1)
plt.title('Coorelation Heatmap')
plt.show()


sns.pairplot(df)
plt.suptitle('Pairwise Relationships',y=1.02)
plt.show()


fig,ax1=plt.subplots(figsize=(12,6))
ax1.set_xlabel('Date')
ax1.set_ylabel('Temperature (°C)',color='tab:red')
ax1.plot(df.index,df['Temperature (°C)'],color='tab:red',label="Temperature")
ax1.tick_params(axis='y',labelcolor='tab:red')
ax2 = ax1.twinx()
ax2.set_ylabel('Rainfall (mm)',color='tab:blue')
ax2.plot(df.index,df['Rainfall (mm)'],color='tab:blue',label="Rainfall")
ax2.tick_params(axis='y',labelcolor='tab:blue')
fig.tight_layout()
plt.title('Temperature and Rainfall Over Time')
plt.show()
```

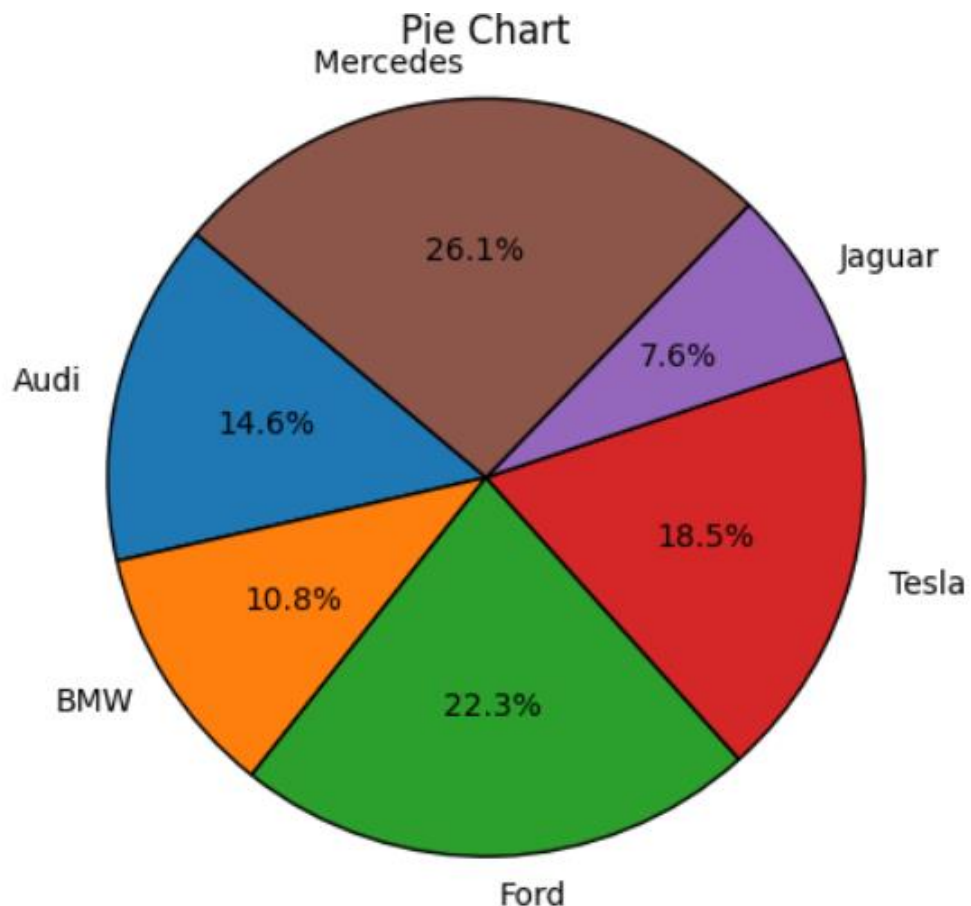


Q1. Write a Python script using Matplotlib to create a labeled pie chart showing the sales distribution of Audi, BMW, Ford, Tesla, Jaguar, and Mercedes.

CODE:

```
import matplotlib.pyplot as plt
car=['Audi', 'BMW', 'Ford','Tesla','Jaguar',' Mercedes']
Data= [23,17,35,29,12,41]
plt.pie(Data, labels=car, autopct= '%1.1f%%',
startangle=140,wedgeprops = {'edgecolor': 'black'})
plt.axis('equal')
plt.show
plt.title('Pie Chart')
```

OUTPUT:



Q2. Write a Python script using Matplotlib to create a labeled pie chart representing the profit distribution over the years 2016 to 2020.

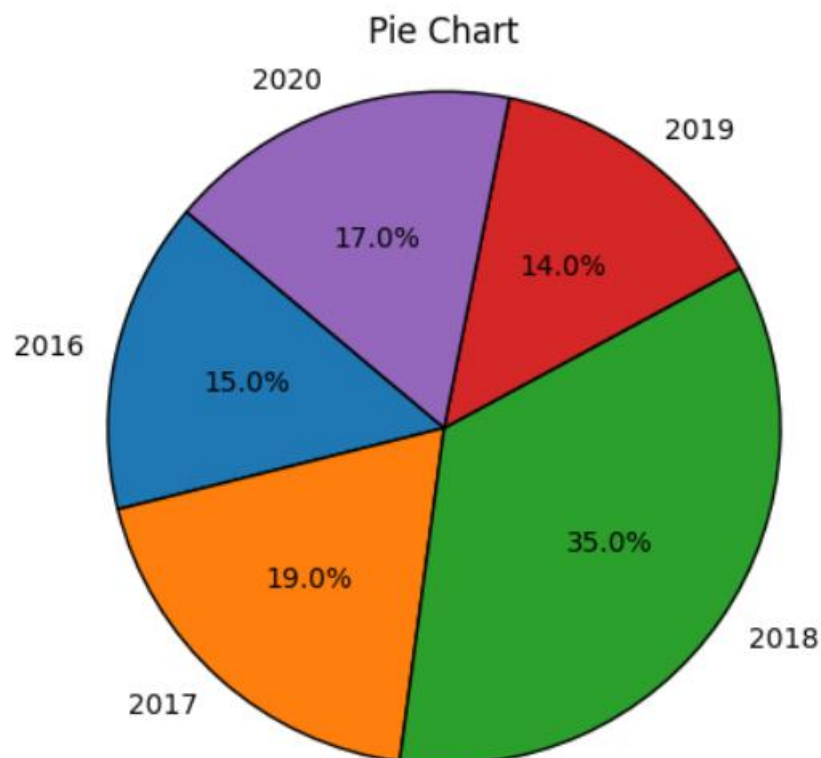
CODE:

```
import matplotlib.pyplot as plt
years = ['2016', '2017', '2018', '2019', '2020']
profit = [15, 19, 35, 14, 17]

plt.pie(profit, labels=years, autopct='%1.1f%%',
startangle=140, wedgeprops = {'edgecolor': 'black'})

plt.title("Pie Chart")
plt.axis('equal')
plt.show()
```

OUTPUT:



Q3. Write a Python script using Matplotlib to create a labeled pie chart with an exploded view for 'Product A' and 'Product C', showing the stock distribution of four products: Product A, Product B, Product C, and Product D.

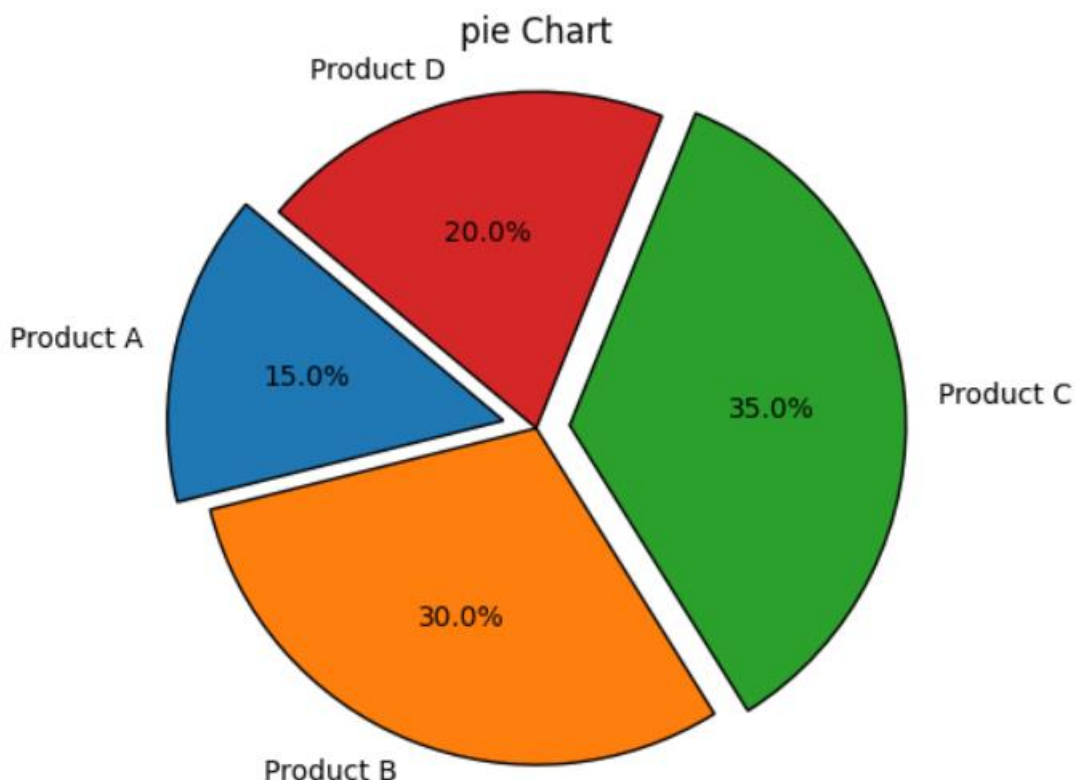
CODE:

```
import matplotlib.pyplot as plt
product = ['Product A' , 'Product B' , 'Product C', 'Product D']
stork = [15, 30, 35, 20]
explode = (0.1, 0, 0.1, 0)

plt.pie(stork, labels=product, autopct='%01.1f%%',
startangle=140, explode=explode, wedgeprops = {'edgecolor':
'black'})

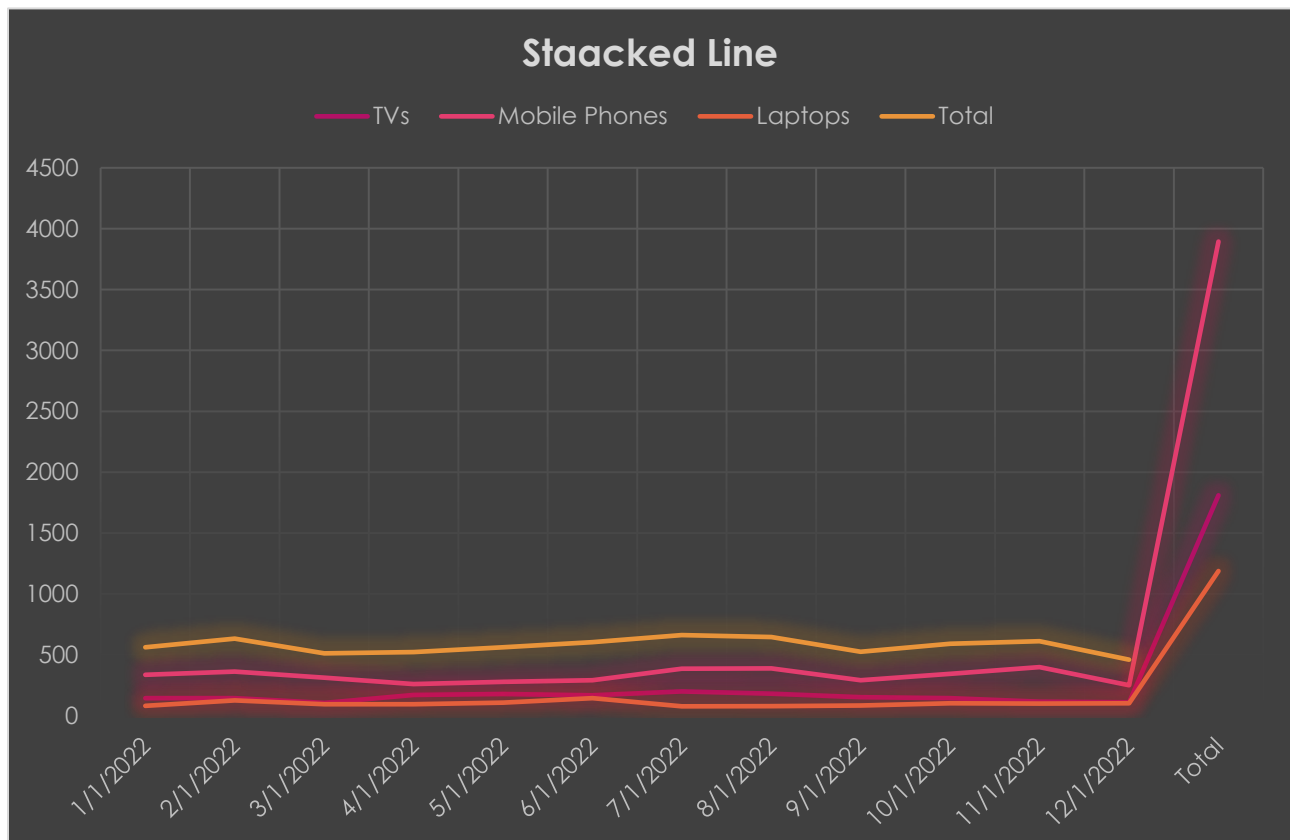
plt.axis('equal')
plt.title("pie Chart")
plt.show()
```

OUTPUT:

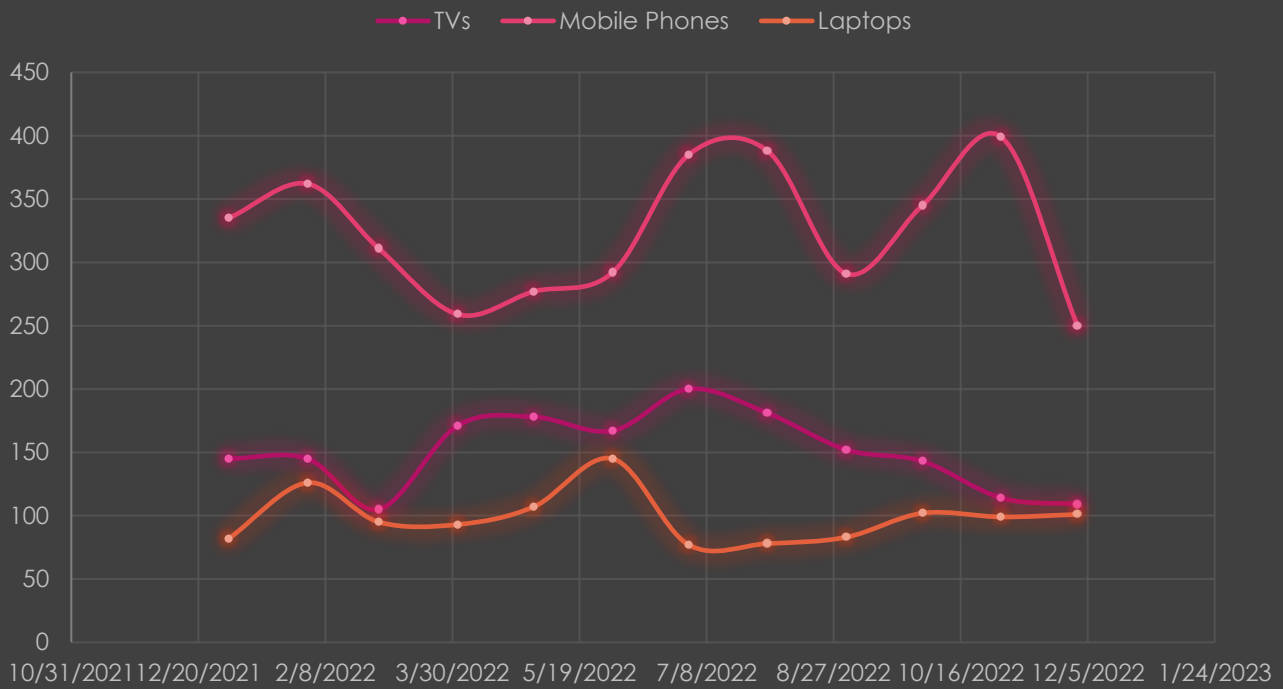


Q13. Make the staacked line, scatter chart, clusterd bar, line chart, area chart, vertical bar, pie chart, surface chart

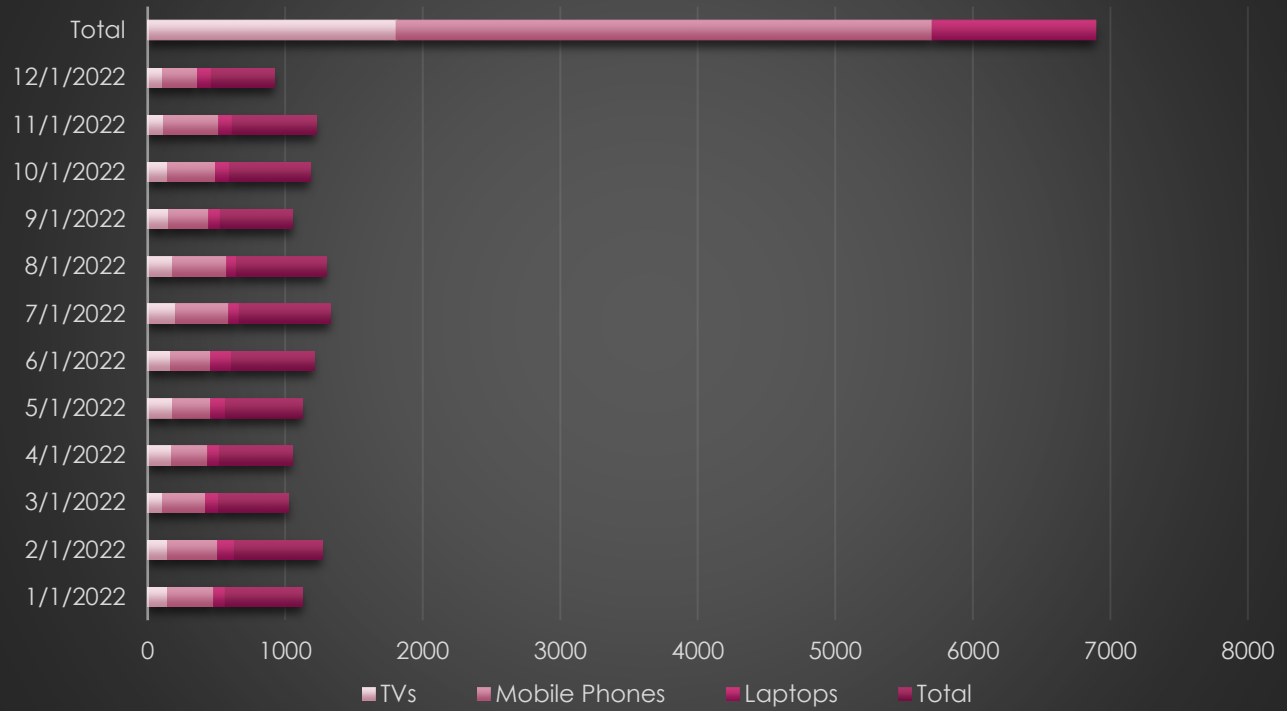
Month	TVs	Mobile Phones	Laptops	Total
1/1/2022	145	335	82	562
2/1/2022	145	362	126	633
3/1/2022	105	311	95	511
4/1/2022	171	259	93	523
5/1/2022	178	277	107	562
6/1/2022	167	292	145	604
7/1/2022	200	385	77	662
8/1/2022	181	388	78	647
9/1/2022	152	291	83	526
10/1/2022	143	345	102	590
11/1/2022	114	399	99	612
12/1/2022	109	250	101	460
Total	1810	3894	1188	



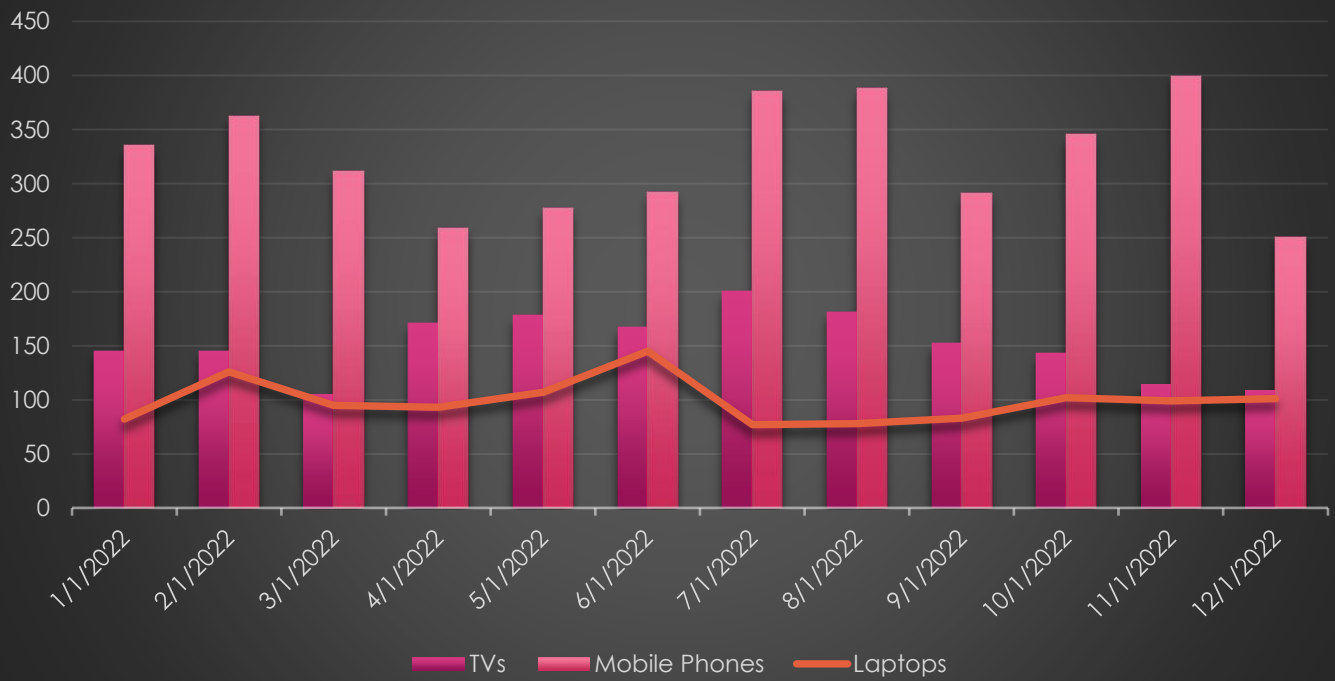
Scatter Chart



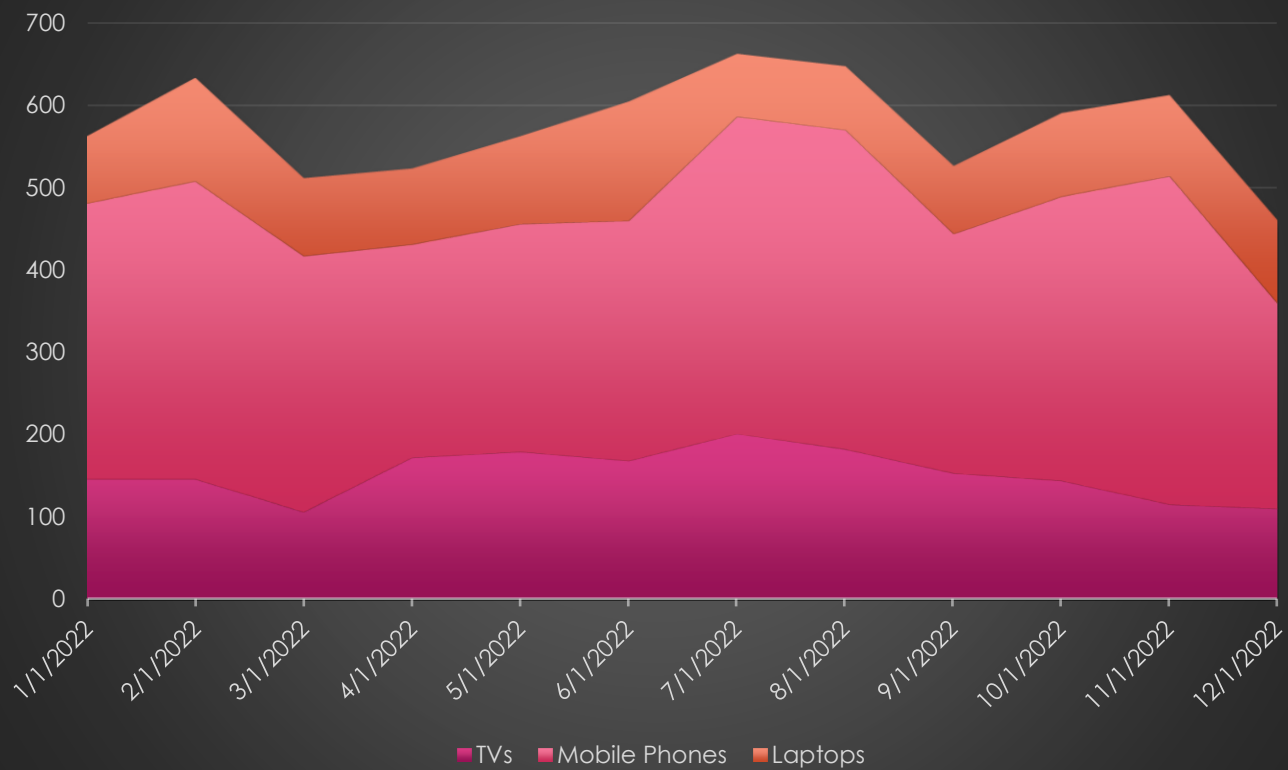
Clustered Bar



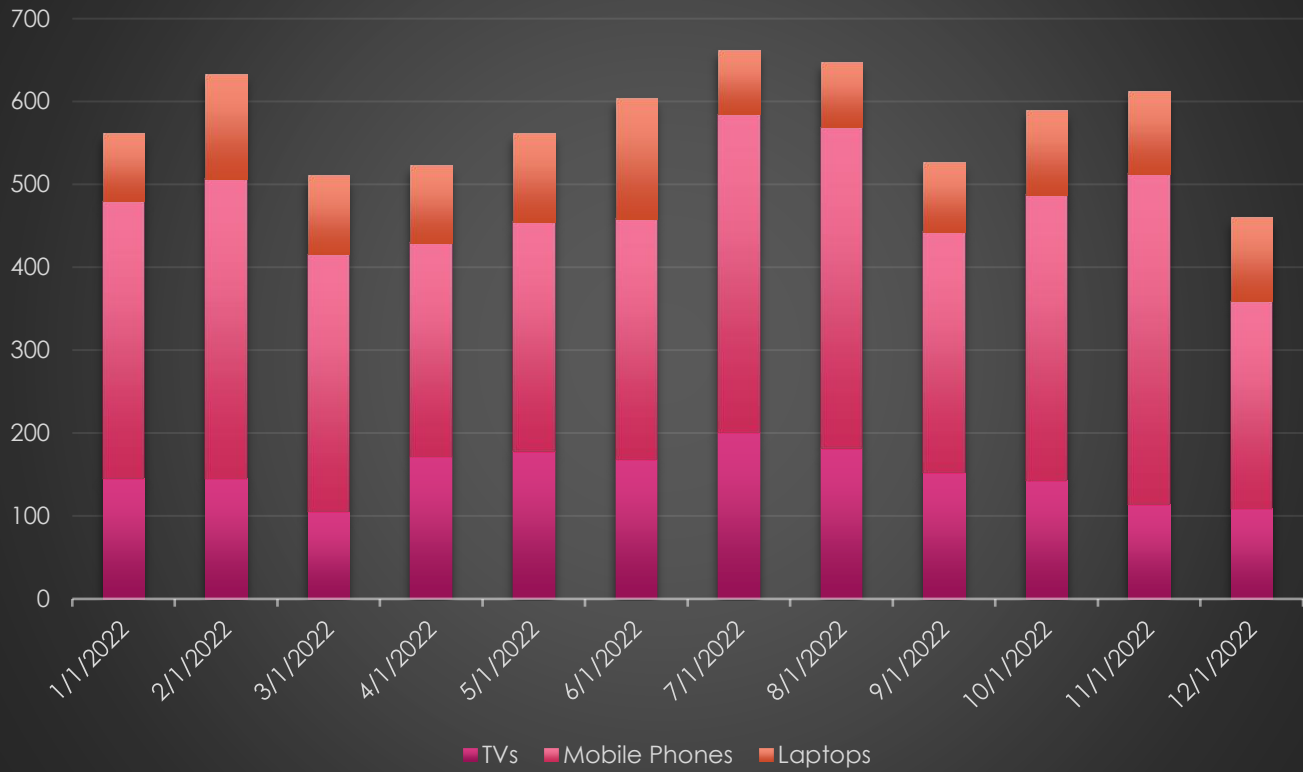
Line Chart



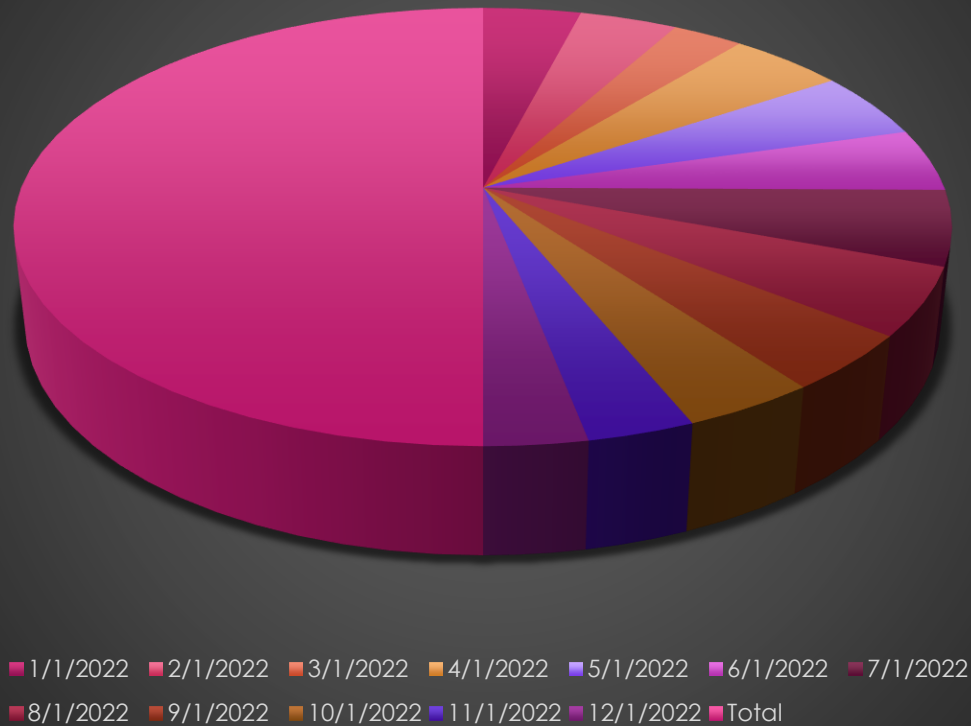
Area Chart



Vertical Bar



Pie chart



Surface Chart

