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Styling headlines

In [83]:
```
%%html
<style>
h1 {
  color: black ;
  background-color: lightpink;
  text-align: center;
  border: 1px solid black;
  transition: color 1s ease-in-out;
  transition: background-color 1s ease-in-out;
}

h1:hover {
  color: cyan    ;
  background-color: black ;
}
h2 {
    color: Crimson;
    border: 1px solid black;
    background-color: PaleTurquoise;
    text-align: center;
    transition: background-color 1s ease-in-out;
}
h2:hover {
  background-color: LightGreen    ;
</style>
```

Importing Libraries

In [73]:
```
# Importing libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns;
```

loading and exploring the data

In [2]:
```
df = pd.read_csv("sales_data.csv")
```

In [3]:
```
df.head()
```

Out[3]:

	date	product	category	price	quantity	revenue
0	2022-01-01	Smartphone	Electronics	600.0	10.0	6000.0
1	2022-01-01	Laptop	Electronics	1200.0	5.0	6000.0
2	2022-01-02	T-Shirt	Clothing	20.0	50.0	1000.0
3	2022-01-03	Headphones	Electronics	100.0	20.0	2000.0
4	2022-01-04	T-Shirt	Clothing	20.0	25.0	500.0

In [4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 369 entries, 0 to 368
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   date      369 non-null    object 
 1   product   369 non-null    object 
 2   category  369 non-null    object 
 3   price     367 non-null    float64
 4   quantity  368 non-null    float64
 5   revenue   368 non-null    float64
dtypes: float64(3), object(3)
memory usage: 17.4+ KB
```

In [5]:
```
df.describe()
```

Out[5]:

	price	quantity	revenue
count	367.000000	368.000000	368.000000
mean	211.226158	14.565217	2060.679348
std	227.335170	8.595740	1910.930790
min	20.000000	3.000000	300.000000
25%	50.000000	8.000000	800.000000
50%	100.000000	12.000000	1200.000000
75%	300.000000	20.000000	2400.000000
max	1200.000000	50.000000	7200.000000

Data Cleaning

WIll fix the data type for date column and solve null issue

In [8]:
```
# Change data types
df['date'] = df['date'].astype('datetime64')
```

In [9]:
```
# Fill in missing values
df['date'].fillna(pd.to_datetime('2023-08-01'), inplace=True)
df['price'].fillna(0, inplace=True)
df['quantity'].fillna(0, inplace=True)
df['revenue'].fillna(0, inplace=True)
```

Another check before We start our analysis

In [10]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 369 entries, 0 to 368
Data columns (total 6 columns):
 #   Column    Non-Null Count  Dtype         
---  ------    --------------  -----         
 0   date      369 non-null    datetime64[ns]
 1   product   369 non-null    object        
 2   category  369 non-null    object        
 3   price     369 non-null    float64       
 4   quantity  369 non-null    float64       
 5   revenue   369 non-null    float64       
dtypes: datetime64[ns](1), float64(3), object(2)
memory usage: 17.4+ KB
```

In [11]:
```
df.head()
```

Out[11]:

	date	product	category	price	quantity	revenue
0	2022-01-01	Smartphone	Electronics	600.0	10.0	6000.0
1	2022-01-01	Laptop	Electronics	1200.0	5.0	6000.0
2	2022-01-02	T-Shirt	Clothing	20.0	50.0	1000.0
3	2022-01-03	Headphones	Electronics	100.0	20.0	2000.0
4	2022-01-04	T-Shirt	Clothing	20.0	25.0	500.0

Assessment Questions

1. **What was the total revenue generated by the company over the course of the year?**
2. **Which product had the highest revenue? How much revenue did it generate?**
3. **What was the average price of a product sold by the company?**
4. **What was the total quantity of products sold by the company?**
5. **Which category had the highest revenue? How much revenue did it generate?**
6. **What was the average revenue per sale?**
7. **What was the total revenue generated in each quarter of the year? (i.e. Q1, Q2, Q3, Q4)**

1-What was the total revenue generated by the company over the course of the year?

In [85]:
```
total_revenue = df["revenue"].sum()
total_revenue
```

Out[85]:
```
758330.0
```

2- Which product had the highest revenue? How much revenue did it generate?

In [94]:
```
max_revenue_product = df.groupby("product")["revenue"].max().sort_values(ascending=
max_revenue = df[df["product"] == max_revenue_product]["revenue"].sum()

print("The higest revenue product is:  " + max_revenue_product+", with Revenue of:
```

```
The higest revenue product is:  Smartphone, with Revenue of: 434400.0$
```

3- What was the average price of a product sold by the company?

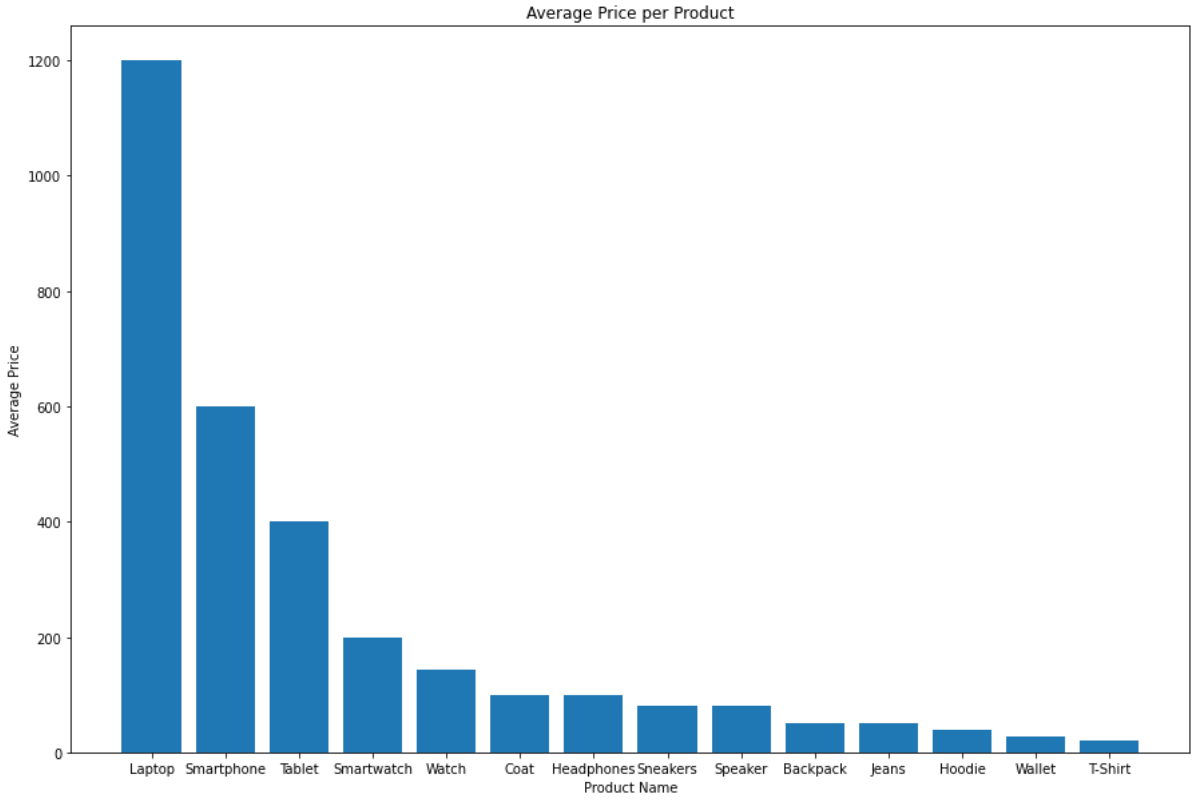
In [139…
```
average_prices_per_product = df.groupby('product').agg(average_pricez=('price', np.
round(average_prices_per_product)
```

Out[139]:

	product	average_pricez
0	Laptop	1200.0
1	Smartphone	600.0
2	Tablet	400.0
3	Smartwatch	200.0
4	Watch	143.0
5	Coat	100.0
6	Headphones	100.0
7	Sneakers	80.0
8	Speaker	80.0
9	Backpack	50.0
10	Jeans	50.0
11	Hoodie	40.0
12	Wallet	28.0
13	T-Shirt	20.0

In [126…

```
product_names = average_prices_per_product['product'].to_numpy()
average_prices = average_prices_per_product['average_pricez'].to_numpy()

plt.figure(figsize=(15, 10))
plt.bar(product_names, average_prices)
plt.xlabel("Product Name")
plt.ylabel("Average Price")
plt.title("Average Price per Product")
plt.show()
```



4- What was the total quantity of products sold by the company?

In [123…

```
# Total quantity of products sold by the company
total_quantity = df["quantity"].sum()
print("total_quantity:  " + str(total_quantity))
```

```
total_quantity:  5360.0
```

5- Which category had the highest revenue? How much revenue did it generate?

In [131…

```
# Category with the highest revenue
max_revenue_category = df.groupby("category")["revenue"].max().sort_values(ascendin
max_revenue_category_revenue = df[df["category"] == max_revenue_category]["revenue"
print(max_revenue_category +"    " +str(max_revenue_category_revenue))
```

```
Electronics    516080.0
```

6- What was the average revenue per sale?

In [143…
```
average_revenue_per_sale = df["revenue"].mean()
round(average_revenue_per_sale,3)
```

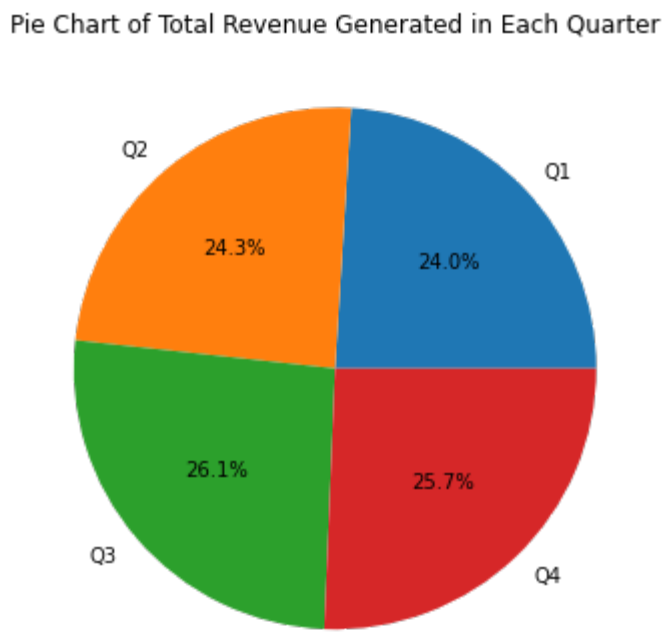
Out[143]:
```
2055.095
```

7- What was the total revenue generated in each quarter of the year? (i.e. Q1, Q2, Q3, Q4)

In [153…
```
df["quarter"] = pd.to_datetime(df["date"]).dt.quarter

quarterly_revenue = df.groupby("quarter")["revenue"].sum()

quarter_names = ["Q1", "Q2", "Q3", "Q4"]

quarterly_revenue_by_name = {}
for quarter, revenue in quarterly_revenue.items():
  quarter_name = quarter_names[quarter - 1]
  quarterly_revenue_by_name[quarter_name] = revenue

print("Total revenue generated in each quarter of the year:")
for quarter, revenue in quarterly_revenue_by_name.items():
  print(quarter, ":", revenue)
```

```
Total revenue generated in each quarter of the year:
Q1 : 182100.0
Q2 : 183970.0
Q3 : 197680.0
Q4 : 194580.0
```

In [159…
```
plt.figure(figsize=(8, 6))

plt.pie(
    quarterly_revenue_by_name.values(),
    labels=quarterly_revenue_by_name.keys(),
    autopct="%1.1f%%",
)
plt.title("Pie Chart of Total Revenue Generated in Each Quarter")
plt.show()
```



Thanks for viewing My report I hope you injoyed it and found it insightfull

By: Mohamed A. Hassan © 2023

mohamadhassan2050@yahoo.com | (+20) 01140313695 | (+20) 01062112940 | https://www.linkedin.com/in/mohamadahassan1 | https://github.com/mohamadahassan1

In [ ]: