iNeuron Internship Project

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Project Title: Financial Analytics

Technologies: Business Intelligence

Domain : Finance

Problem Statement:

You are tasked to analyzing the competition for the management to provide better results.

This data set has information on the market capitalization of the top 500 companies in India.

Serial Number, Name of Company, Market Capitalization in Crores ,Quarterly Sale in crores

Find key metrics and factors and show the meaningful relationships between attributes.

Do your own research and come up with your findings.

Importing Libraries

Importing the necessary libraries for data manipulation, analysis, and visualization.

```
pip install seaborn
```

```
Collecting seaborn
  Using cached seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from seaborn) (1.24
Requirement already satisfied: pandas>=1.2 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from seaborn) (2.0.3)
Requirement already satisfied: matplotlib!=3.6.1,>=3.4 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from seaborn) (3
Requirement already satisfied: contourpy>=1.0.1 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,>
Requirement already satisfied: cycler>=0.10 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,>=3.4
Requirement already satisfied: fonttools>=4.22.0 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,
Requirement already satisfied: kiwisolver>=1.0.1 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,
Requirement already satisfied: packaging>=20.0 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,>=
Requirement already satisfied: pillow>=6.2.0 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,>=3
Requirement already satisfied: pyparsing>=2.3.1 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6.1,>
Requirement already satisfied: python-dateutil>=2.7 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotlib!=3.6
Requirement already satisfied: importlib-resources>=3.2.0 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from matplotli
Requirement already satisfied: pytz>=2020.1 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from pandas>=1.2->seaborn)
Requirement already satisfied: tzdata>=2022.1 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from pandas>=1.2->seaborn
Requirement already satisfied: zipp>=3.1.0 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from importlib-resources>=3.2
Requirement already satisfied: six>=1.5 in e:\datascience_projects\cv\e-kyc\venv\lib\site-packages (from python-dateutil>=2.7->matpl
Using cached seaborn-0.13.2-py3-none-any.whl (294 kB)
Installing collected packages: seaborn
Successfully installed seaborn-0.13.2
Note: you may need to restart the kernel to use updated packages.
```

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

Loading Dataset

Read the dataset file into a pandas DataFrame

```
df = pd.read_csv(r'E:\DataScience_Projects\analysis\Financial-Analytics-iNeuron-\Top 500 Companies - India.csv')
df.head()
```

	S.No.	Name	Mar Cap - Crore	Sales Qtr - Crore	Unnamed: 4
0	1	Reliance Inds.	583436.72	99810.00	NaN
1	2	TCS	563709.84	30904.00	NaN
2	3	HDFC Bank	482953.59	20581.27	NaN
3	4	ITC	320985.27	9772.02	NaN
4	5	H D F C	289497.37	16840.51	NaN

Defining columns:

Market Capitalization: Market capitalization is a measure of the total value of a publicly traded company. It is calculated by multiplying the current market price of a company's outstanding shares by the total number of those shares.

It is used as an indicator of a company's size and is one of the most commonly used metrics to evaluate and compare companies in the financial markets.

Companies with larger market capitalizations are generally considered to be more established and stable, while those with smaller market capitalizations are often seen as riskier or having greater growth potential.

Sales : Sales, in a business context, refers to the revenue generated from the selling of goods or services to customers. It represents the total value of products or services sold by a company during a specific period, typically measured in monetary terms.

Data Exploration and Preprocessing

Perform initial data exploration to understand the structure of the dataset and preprocess it as needed.

```
#Checking columns
df.columns
```

```
Index(['S.No.', 'Name', 'Mar Cap - Crore', 'Sales Qtr - Crore', 'Unnamed: 4'], dtype='object')
```

```
#Total number of rows and columns
df.shape
```

```
(488, 5)
```

```
#Complete information about the dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 488 entries, 0 to 487
Data columns (total 5 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   S.No.              488 non-null    int64
 1   Name               488 non-null    object
 2   Mar Cap - Crore    479 non-null    float64
 3   Sales Qtr - Crore  365 non-null    float64
 4   Unnamed: 4         94 non-null     float64
dtypes: float64(3), int64(1), object(1)
memory usage: 19.2+ KB
```

```
#Checking duplicate values
df.duplicated().sum()
```

```
0
```

```
#Checking null values
df.isnull().sum()
```

```
S.No.                  0
Name                   0
Mar Cap - Crore        9
Sales Qtr - Crore    123
Unnamed: 4           394
dtype: int64
```

```
#Removing unncessary column
df = df.drop('Unnamed: 4', axis =1 )
```

```
#Handling missing values by dropping rows with missing values
df = df.dropna()


#Let's check our dataset now!
df.isnull().sum()
```

```
S.No.               0
Name                0
Mar Cap - Crore     0
Sales Qtr - Crore   0
dtype: int64
```

```
#Statistical description
df.describe()
```

	S.No.	Mar Cap - Crore	Sales Qtr - Crore
count	365.000000	365.000000	365.000000
mean	250.435616	31300.970301	4395.976849
std	147.106354	67224.641338	11092.206185
min	1.000000	3017.070000	47.240000
25%	133.000000	5089.870000	593.740000
50%	264.000000	9097.330000	1278.300000
75%	363.000000	21372.180000	2840.750000
max	499.000000	583436.720000	110666.930000

Feature Engineering

Create additional meaningful features that can aid in the analysis. For example, calculate the profit margin using the existing columns.

Profit Margin: It represents the proportion of profit earned per unit of sales. A higher profit margin implies that the company is effectively generating profits from its operations.

```
# Calculate Profit Margin
df['Profit Margin'] = df['Mar Cap - Crore'] / df['Sales Qtr - Crore']


# Calculate Market Share
total_market_sales = df['Sales Qtr - Crore'].sum()
df['Market_Share'] = (df['Sales Qtr - Crore'] / total_market_sales) * 100

df.head()
```

	S.No.	Name	Mar Cap - Crore	Sales Qtr - Crore	Profit Margin	Market_Share
0	1	Reliance Inds.	583436.72	99810.00	5.845474	6.220507
1	2	TCS	563709.84	30904.00	18.240676	1.926045
2	3	HDFC Bank	482953.59	20581.27	23.465685	1.282696
3	4	ITC	320985.27	9772.02	32.847382	0.609026
4	5	H D F C	289497.37	16840.51	17.190535	1.049559

Exploratory Data Analysis (EDA)

Perform exploratory analysis to gain insights into the dataset and identify relationships between attributes.

```
# Correlation matrix
correlation_matrix = df.corr()
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm')
plt.title('Correlation Matrix')
plt.show()
```

Insights:

1. Market Capitalization and Sales are moderately correlated.

2. There is negative and zero correlation between Profit Margin with respect to Sales and Market Cap.

Key Metrics and Factors:

Identify key metrics and factors for analysis. For example, you can focus on market capitalization and sales as key indicators of competition.

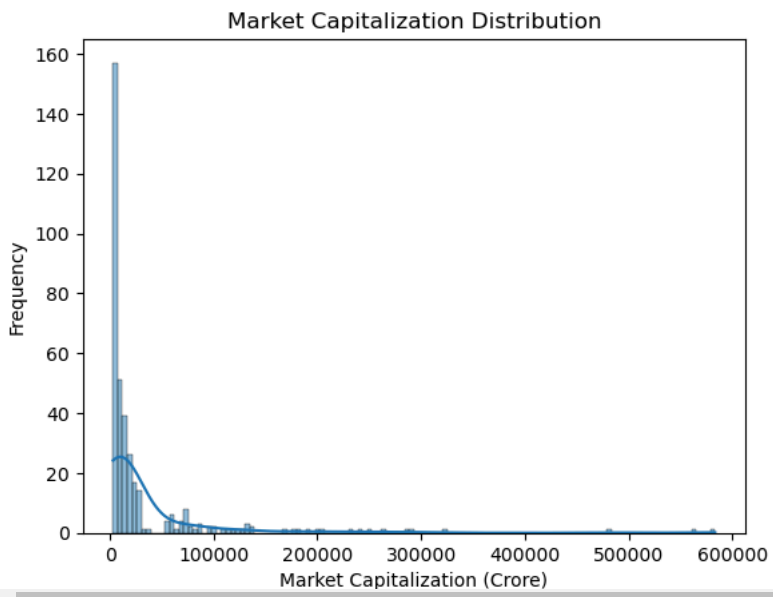
```
# Key Metrics
mean_market_cap = df['Mar Cap - Crore'].mean()
median_market_cap = df['Mar Cap - Crore'].median()
total_sales = df['Sales Qtr - Crore'].sum()

print(f"Mean Market Capitalization: {mean_market_cap}")
print(f"Median Market Capitalization: {median_market_cap}")
print(f"Total Sales: {total_sales}")
```

```
Mean Market Capitalization: 31300.970301369864
Median Market Capitalization: 9097.33
Total Sales: 1604531.55
```

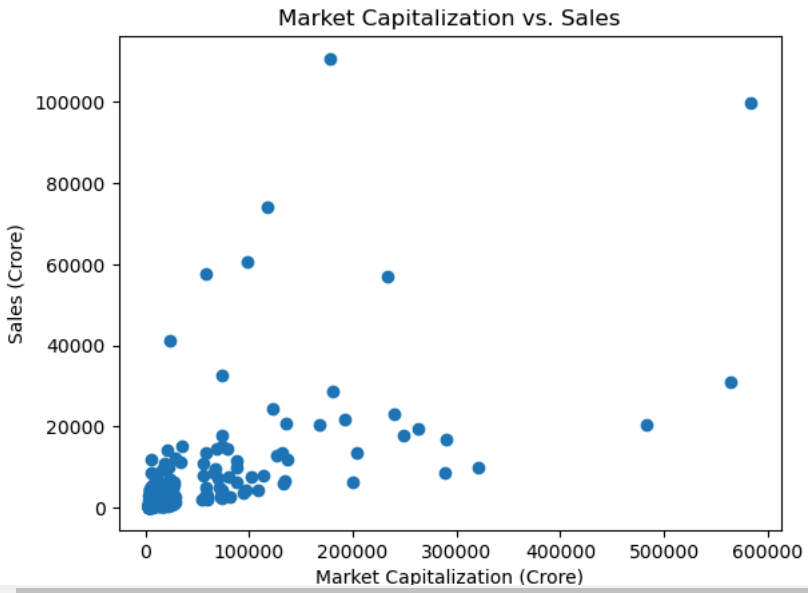
Comparative Analysis and Data Visualization:

Conduct comparative analysis and visualize the data to understand competition and relationships between variables.

```
# Visualize Market Capitalization
sns.histplot(df['Mar Cap - Crore'], kde=True)
plt.title('Market Capitalization Distribution')
plt.xlabel('Market Capitalization (Crore)')
plt.ylabel('Frequency')
plt.show()
```



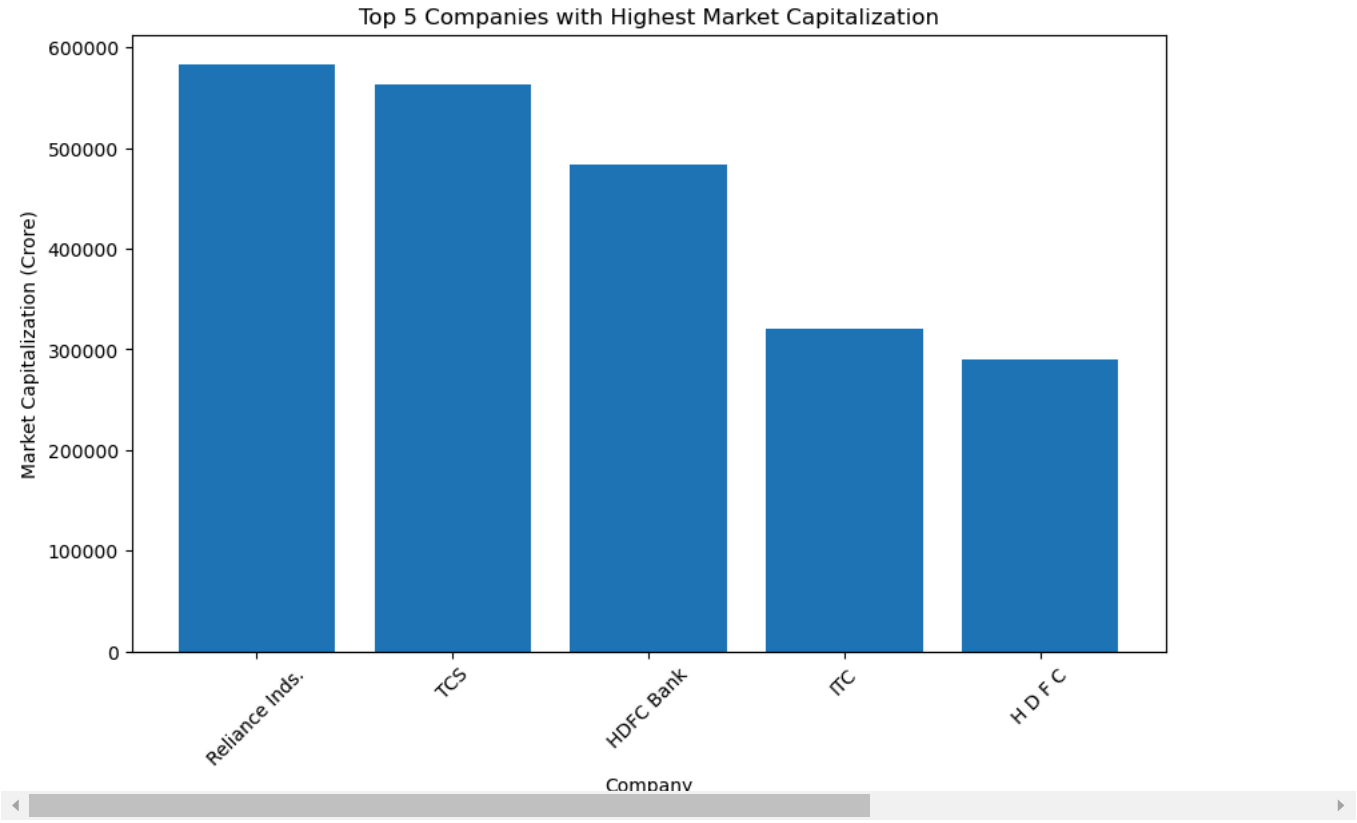

```
# Scatter plot of Market Cap vs. Sales
plt.scatter(df['Mar Cap - Crore'], df['Sales Qtr - Crore'])
plt.title('Market Capitalization vs. Sales')
plt.xlabel('Market Capitalization (Crore)')
plt.ylabel('Sales (Crore)')
plt.show()
```



TOP 5 COMPANIES WITH HIGH MARKET CAPITALIZATION:

```
# Sort the dataset by market capitalization in descending order
sorted_data = df.sort_values('Mar Cap - Crore', ascending=False)

# Select the top 5 companies with the highest market capitalization
top_5_companies = sorted_data.head(5)


print(top_5_companies.value_counts())
# Plot the market capitalization of the top 5 companies
plt.figure(figsize=(10, 6))
plt.bar(top_5_companies['Name'], top_5_companies['Mar Cap - Crore'])
plt.title('Top 5 Companies with Highest Market Capitalization')
plt.xlabel('Company')
plt.ylabel('Market Capitalization (Crore)')
plt.xticks(rotation=45)
plt.show()
```

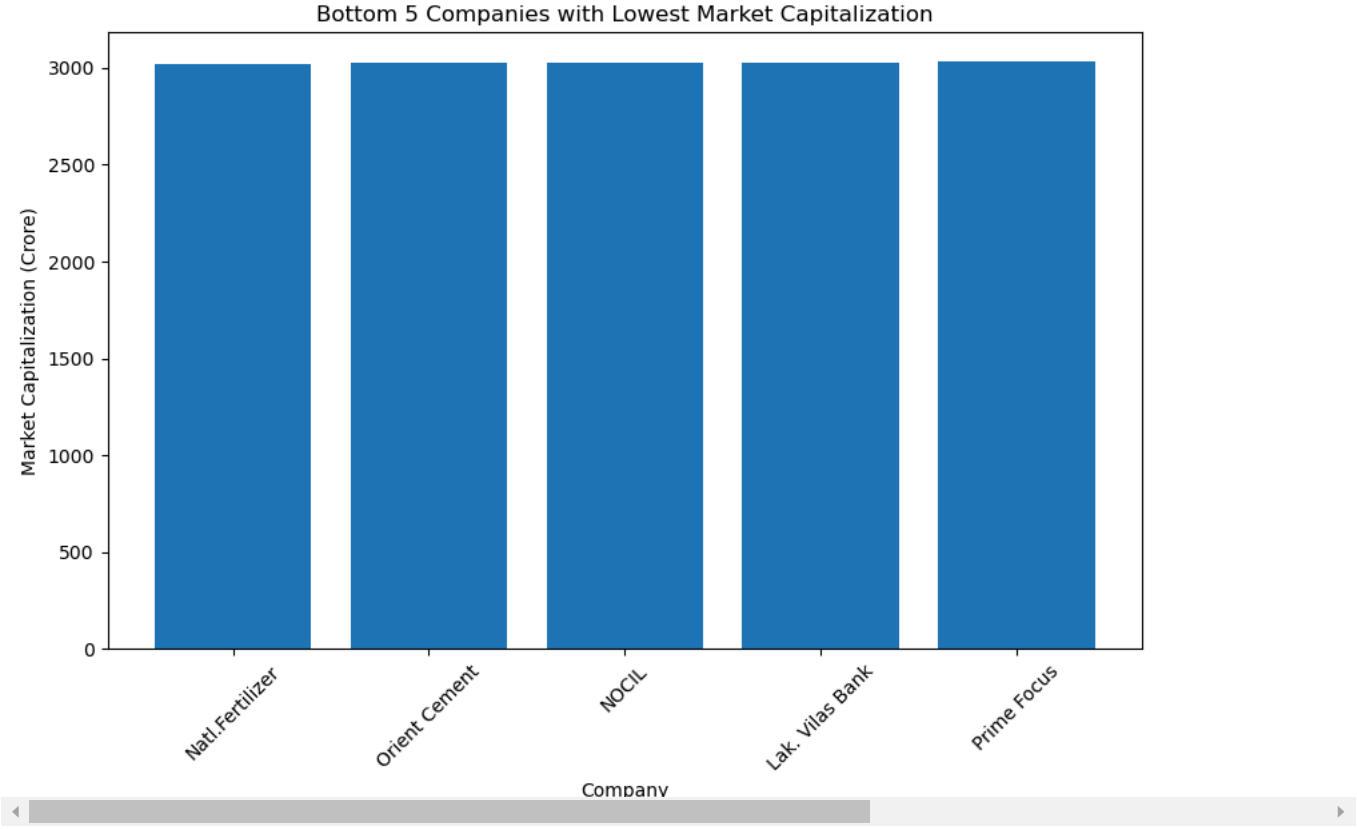
```
S.No.  Name           Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
1      Reliance Inds.  583436.72        99810.00           5.845474       6.220507       1
2      TCS             563709.84        30904.00           18.240676      1.926045       1
3      HDFC Bank       482953.59        20581.27           23.465685      1.282696       1
4      ITC             320985.27        9772.02            32.847382      0.609026       1
5      H D F C         289497.37        16840.51           17.190535      1.049559       1
dtype: int64
```



BOTTOM 5 COMPANIES WITH LOW MARKET CAPITALIZATION:

```
# Sort the dataset by market capitalization in ascending order
sorted_data = df.sort_values('Mar Cap - Crore')

# Select the bottom 5 companies with the lowest market capitalization
bottom_5_companies = sorted_data.head(5)


print(bottom_5_companies.value_counts())



# Plot the market capitalization of the bottom 5 companies
plt.figure(figsize=(10, 6))
plt.bar(bottom_5_companies['Name'], bottom_5_companies['Mar Cap - Crore'])
plt.title('Bottom 5 Companies with Lowest Market Capitalization')
plt.xlabel('Company')
plt.ylabel('Market Capitalization (Crore)')
plt.xticks(rotation=45)
plt.show()
```

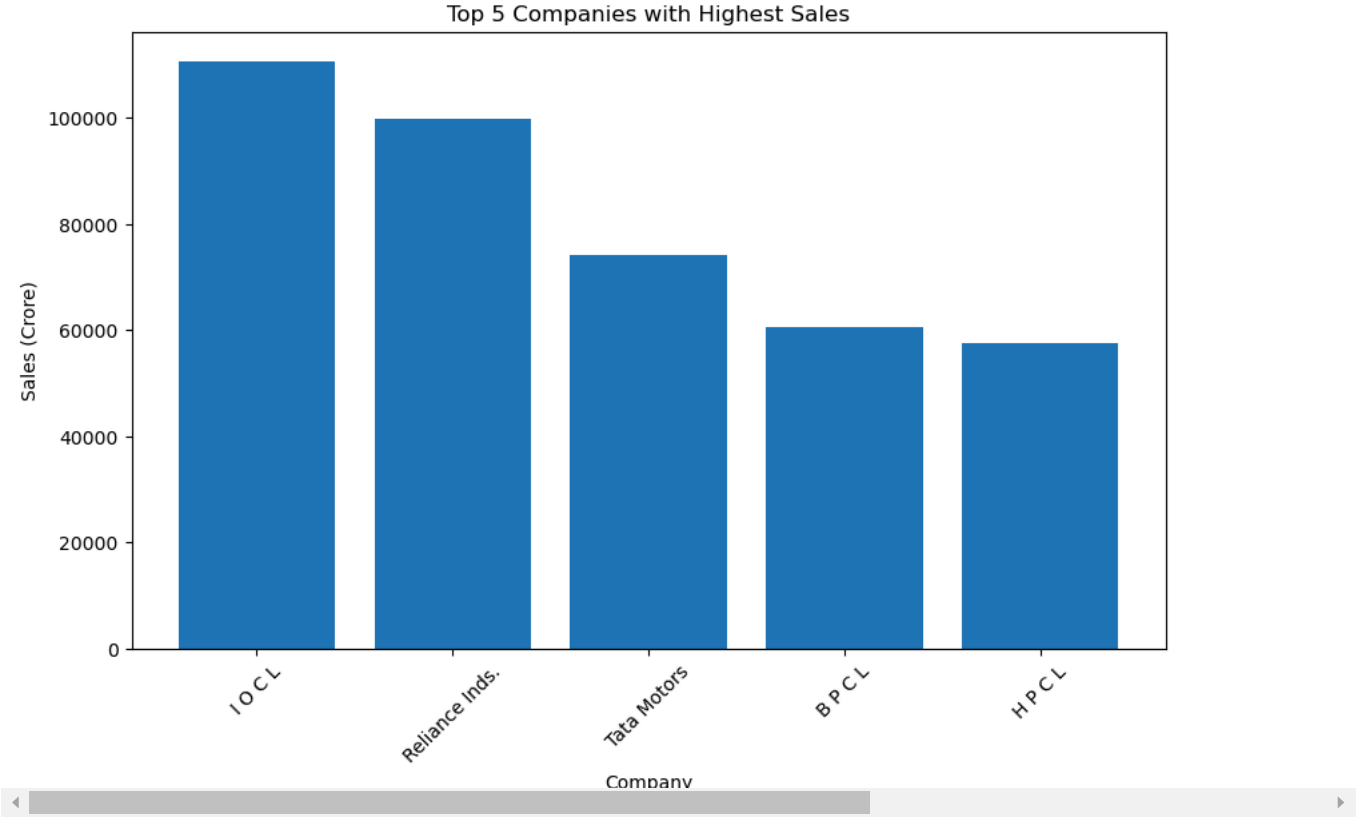
```
   S.No.  Name            Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
495    Prime Focus      3031.50          609.61             4.972851       0.037993        1
496    Lak. Vilas Bank  3029.57          790.17             3.834074       0.049246        1
497    NOCIL            3026.26          249.27             12.140490      0.015535        1
498    Orient Cement    3024.32          511.53             5.912302       0.031880        1
499    Natl.Fertilizer  3017.07          2840.75            1.062068       0.177045        1
dtype: int64
```



TOP 5 COMPANIES WITH HIGHEST SALES:

```
# Sort the dataset by sales in descending order
sorted_data = df.sort_values('Sales Qtr - Crore', ascending=False)

# Select the top 5 companies with the highest sales
top_5_companies_sales = sorted_data.head(5)

print(top_5_companies_sales.value_counts())
# Plot the sales of the top 5 companies
plt.figure(figsize=(10, 6))
plt.bar(top_5_companies_sales['Name'], top_5_companies_sales['Sales Qtr - Crore'])
plt.title('Top 5 Companies with Highest Sales')
plt.xlabel('Company')
plt.ylabel('Sales (Crore)')
plt.xticks(rotation=45)
plt.show()
```

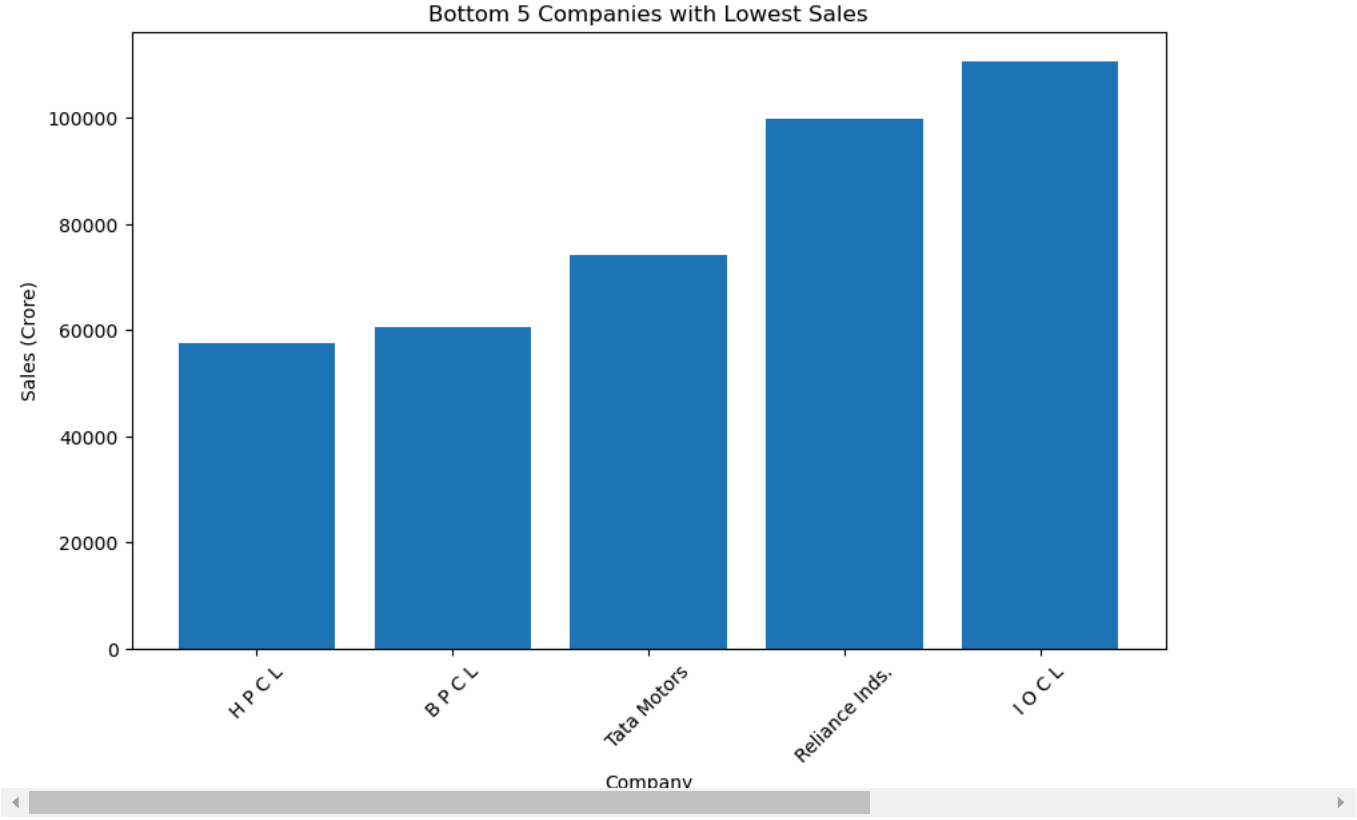
```
S.No.  Name           Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
1      Reliance Inds.  583436.72        99810.00           5.845474       6.220507       1
15     I O C L         178017.48        110666.93          1.608588       6.897149       1
24     Tata Motors     117071.87        74156.07           1.578723       4.621665       1
28     B P C L         98278.00         60616.36           1.621311       3.777823       1
55     H P C L         58034.78         57474.25           1.009753       3.581996       1
dtype: int64
```



BOTTOM 5 COMPANIES WITH LOWEST SALES:

```
# Sort the dataset by sales in ascending order
sorted_data = df.sort_values('Sales Qtr - Crore')

# Select the bottom 5 companies with the highest sales
bottom_5_companies_sales = sorted_data.tail(5)
print(bottom_5_companies_sales.value_counts())
# Plot the sales of the bottom 5 companies
plt.figure(figsize=(10, 6))
plt.bar(bottom_5_companies_sales['Name'], bottom_5_companies_sales['Sales Qtr - Crore'])
plt.title('Bottom 5 Companies with Lowest Sales')
plt.xlabel('Company')
plt.ylabel('Sales (Crore)')
plt.xticks(rotation=45)
plt.show()
```

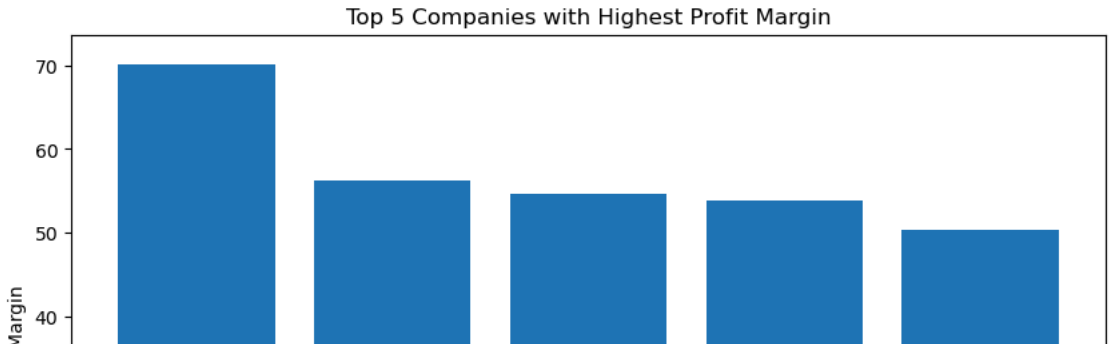
```
   S.No.  Name           Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
1      Reliance Inds.  583436.72        99810.00           5.845474       6.220507       1
15     I O C L         178017.48        110666.93          1.608588       6.897149       1
24     Tata Motors     117071.87        74156.07           1.578723       4.621665       1
28     B P C L         98278.00         60616.36           1.621311       3.777823       1
55     H P C L         58034.78         57474.25           1.009753       3.581996       1
dtype: int64
```



TOP 5 COMPANIES WITH HIGHEST PROFIT MARGIN:

```
# Sort the dataset by profit margin in descending order
sorted_data = df.sort_values('Profit Margin', ascending=False)

# Select the top 5 companies with the highest profit margin
top_5_companies_pm = sorted_data.head(5)


print(top_5_companies_pm.value_counts())

# Plot the profit margin of the top 5 companies
plt.figure(figsize=(10, 6))
plt.bar(top_5_companies_pm['Name'], top_5_companies_pm['Profit Margin'])
plt.title('Top 5 Companies with Highest Profit Margin')
plt.xlabel('Company')
plt.ylabel('Profit Margin')
plt.xticks(rotation=45)
plt.show()
```

```
   S.No.  Name              Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
130    Gillette India    21976.74         407.52             53.928004      0.025398       1
193    Indiabulls Vent.  13396.15         238.43             56.184834      0.014860       1
215    Symphony          11882.55         217.63             54.599779      0.013563       1
468    La Opala RG       3510.93          69.77              50.321485      0.004348       1
480    Central Dep. Ser  3316.31          47.24              70.201312      0.002944       1
dtype: int64
```



BOTTOM 5 COMPANIES WITH LOWEST PROFIT MARGIN:

```
# Sort the dataset by profit margin in ascending order
sorted_data = df.sort_values('Profit Margin')

# Select the bottom 5 companies with the lowest profit margin
bottom_5_companies_pm = sorted_data.head(5)


print(bottom_5_companies_pm.value_counts())

# Plot the profit margin of the bottom 5 companies

plt.figure(figsize=(10, 6))
plt.bar(bottom_5_companies_pm['Name'], bottom_5_companies_pm['Profit Margin'])
plt.title('Bottom 5 Companies with Lowest Profit Margin')
plt.xlabel('Company')
plt.ylabel('Profit Margin')
plt.xticks(rotation=45)
plt.show()
```

```
   S.No.  Name              Mar Cap - Crore  Sales Qtr - Crore  Profit Margin  Market_Share
123    Rajesh Exports    23495.54         41304.84           0.568833       2.574262       1
333    Redington India   5896.54          11728.40           0.502757       0.730955       1
347    C P C L           5427.82          8587.17            0.632085       0.535182       1
454    Corporation Bank  3716.46          4387.85            0.846989       0.273466       1
457    Oriental Bank     3674.60          4262.08            0.862161       0.265628       1
dtype: int64
```