

Financial Analysis

Importing Necessary Libraries and Datasets

```
In [72]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns

In [4]: df = pd.read_csv('Finance_data.csv', encoding = 'unicode_escape')
```

Cleaning of the Dataset

```
In [73]: df.shape
Out[73]: (479, 4)

In [74]: df.isnull().sum()
Out[74]: S.No.      0
Name      0
Mar Cap - Crore      9
Sales Qtr - Crore    21
dtype: int64

In [75]: df.head(50)
Out[75]:
```

	S.No.	Name	Mar Cap - Crore	Sales Qtr - Crore
0	1	Reliance Inds.	583436.72	99810.00
1	2	TCS	563709.84	30904.00
2	3	HDFC Bank	482963.59	20581.27
3	4	ITC	320985.27	9772.02
4	5	H D F C	289497.37	16840.51
5	6	Hind Unilever	288265.26	8590.00
6	7	Maruti Suzuki	263493.81	15283.20
7	8	Infosys	248320.35	17794.00
8	9	O N G C	239981.50	22995.88
9	10	St Bk of India	232763.33	57014.08
10	11	ICICI Bank	203802.35	13665.35
11	12	Kotak Mah. Bank	199253.77	6390.71
12	13	Coal India	192677.98	21643.28
13	14	Larsen & Toubro	180860.74	28747.45
14	15	I O C L	178017.48	110666.93
15	16	Bharti Airtel	167131.29	20319.60
16	17	Axis Bank	136380.76	11721.55
17	18	NTPC	135390.53	20774.37
18	19	Sun Pharma Inds.	134241.36	6653.23
19	20	Hind Zirc	133266.56	5922.00
20	21	Wipro	131840.57	13669.00
21	22	HCL Technologies	126335.27	12809.00
22	23	Vedanta	122184.17	24361.00
23	24	Tata Motors	117071.87	74156.07
24	25	UltraTech Cem.	113692.87	8019.24
25	26	Asian Paints	108044.04	4260.52
26	27	Power Grid Corpn	102016.01	7596.95
27	28	B P C L	98278.00	60616.36
28	29	IndusInd Bank	97379.96	4286.78
29	30	Bajaj Fin.	94476.77	3540.63
30	31	Bajaj Auto	88252.60	6389.34
31	32	M & M	88142.35	11577.78
32	33	HDFC Stand. L	87358.23	9734.90
33	34	Adani Ports	81781.89	2688.85
34	35	Bajaj Finserv	79795.11	7665.40
35	36	GAIL (India)	78670.97	14414.34
36	37	Avenue Super.	74066.35	4094.82
37	38	Titan Company	73886.00	4274.84
38	39	JSW Steel	73670.26	17961.00
39	40	Grasim Inds	73532.62	15291.42
40	41	Tata Steel	73376.14	32464.14
41	42	Eicher Motors	73311.41	2269.01
42	43	Nestle India	73015.49	2601.46
43	44	Godrej Consumer	71859.82	2630.30
44	45	Yes Bank	71028.13	5070.30
45	46	Hero Motocorp	69448.66	7305.49
46	47	Motherson Sumi	66590.33	14397.85
47	48	SBI Life Insuran	67465.00	9569.97
48	49	General Insuranc	66316.32	8557.68
49	50	Bharti Infr.	61776.92	NaN

Calculations of KPIs

```
In [6]: AvgMarCap = df['Mar Cap - Crore'].mean()

In [7]: print(AvgMarCap)
28043.85718997912

In [8]: TotalMarCap = df['Mar Cap - Crore'].sum()

In [9]: print(TotalMarCap)
13433087.56

In [10]: AvgQtrSales = df['Sales Qtr - Crore'].mean()

In [11]: print(AvgQtrSales)
3816.1833624454153

In [12]: TotalQtrSales = df['Sales Qtr - Crore'].sum()

In [13]: print(TotalQtrSales)
1747775.3409080003

In [14]: df['MarCap_QtrSales_Ratio'] = (df['Mar Cap - Crore'] / df['Sales Qtr - Crore'])

In [15]: print(AvgMarCap)
28043.85718997912

In [16]: AvgRatio = df['MarCap_QtrSales_Ratio'].mean()

In [17]: print(AvgRatio)
15.334604811015371

In [18]: df.head()
Out[18]:
```

	S.No.	Name	Mar Cap - Crore	Sales Qtr - Crore	MarCap_QtrSales_Ratio
0	1	Reliance Inds.	583436.72	99810.00	5.845474
1	2	TCS	563709.84	30904.00	18.240676
2	3	HDFC Bank	482963.59	20581.27	23.466685
3	4	ITC	320985.27	9772.02	32.847382
4	5	H D F C	289497.37	16840.51	17.190535

```
In [19]: TopPerformersMarCap = df.nlargest(10, 'Mar Cap - Crore')

In [20]: TopPerformersQtrSales = df.nlargest(10, 'Sales Qtr - Crore')

In [21]: BottomPerformersMarCap = df.nsmallest(10, 'Mar Cap - Crore')

In [22]: BottomPerformersQtrSales = df.nsmallest(10, 'Sales Qtr - Crore')

In [40]: z_scores = np.abs((df['MarCap_QtrSales_Ratio'] - df['MarCap_QtrSales_Ratio'].mean()) / df['MarCap_QtrSales_Ratio'].std())

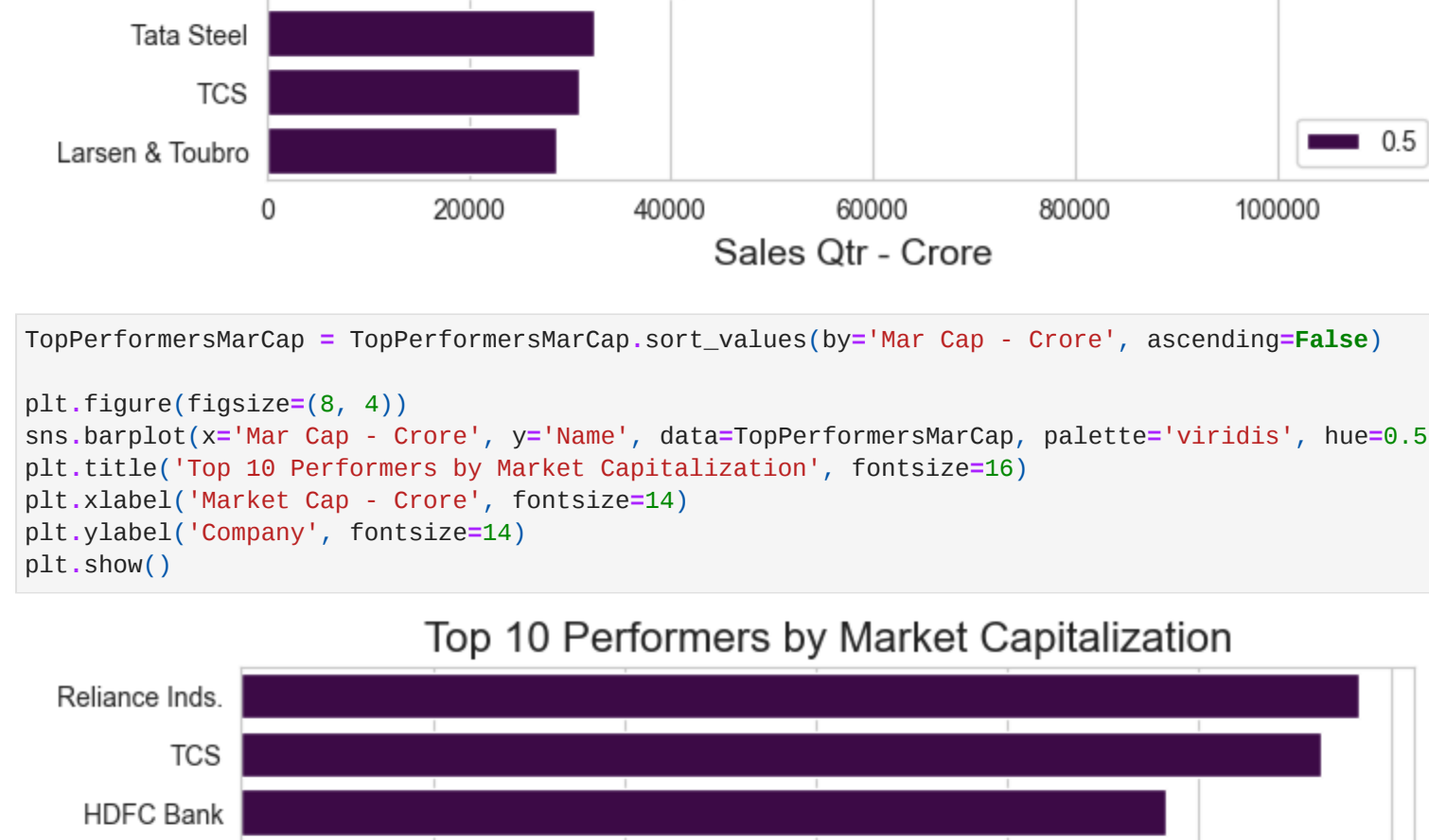
threshold = 3
outliers = df[z_scores > threshold]

print(outliers)
S.No.  Name  Mar Cap - Crore  Sales Qtr - Crore  MarCap_QtrSales_Ratio
225   235  SPARC              10765.33              19.42              553.817199
```

Charts and Visualizations

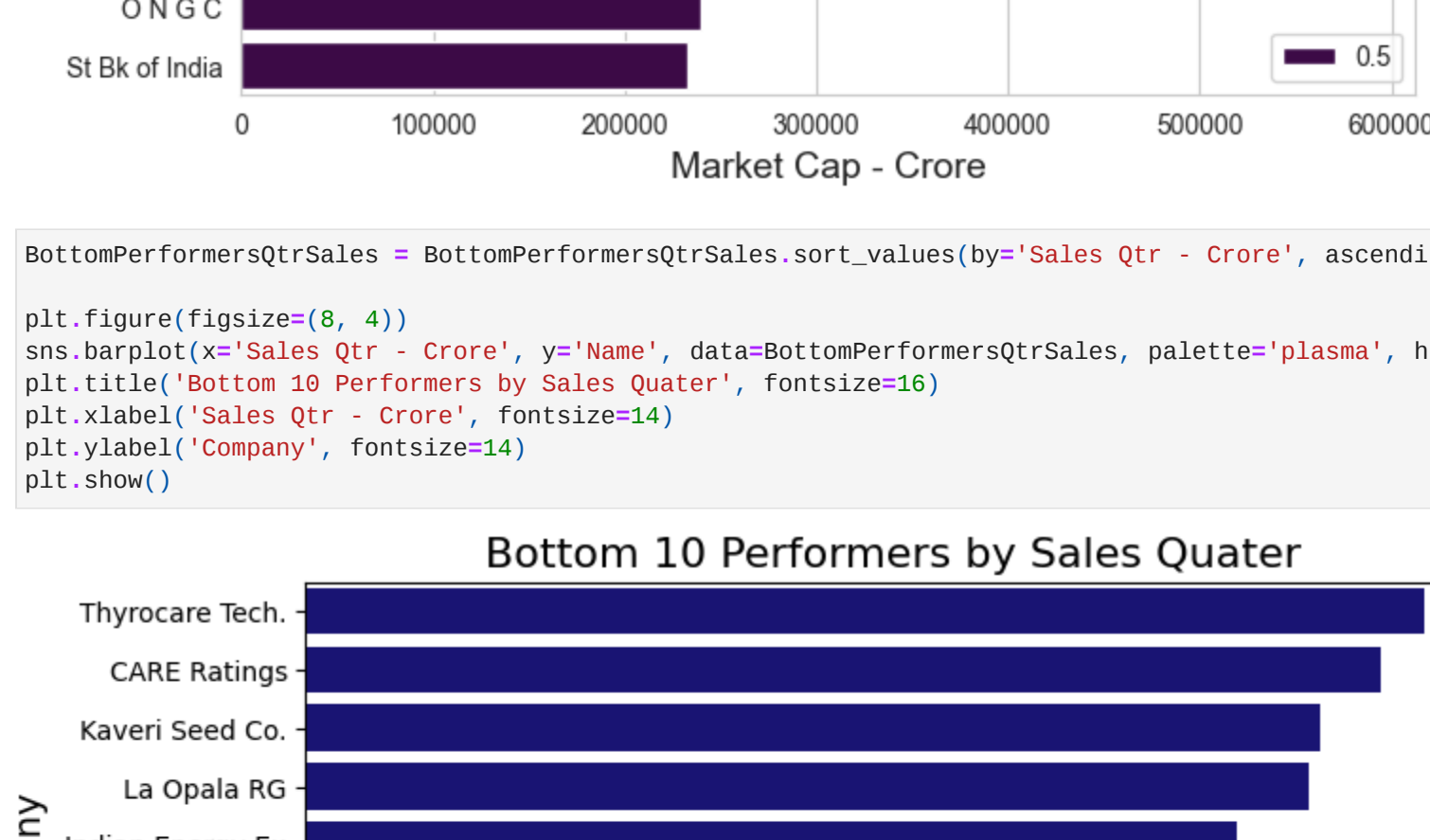
```
In [207]: TopPerformersQtrSales = TopPerformersQtrSales.sort_values(by='Sales Qtr - Crore', ascending=False)

plt.figure(figsize=(8, 4))
sns.barplot(x='Sales Qtr - Crore', y='Name', data=TopPerformersQtrSales, palette='viridis', hue=0.5)
plt.title('Top 10 Performers by Sales Quarter', fontsize=16)
plt.xlabel('Sales Qtr - Crore', fontsize=14)
plt.ylabel('Company', fontsize=14)
plt.show()
```



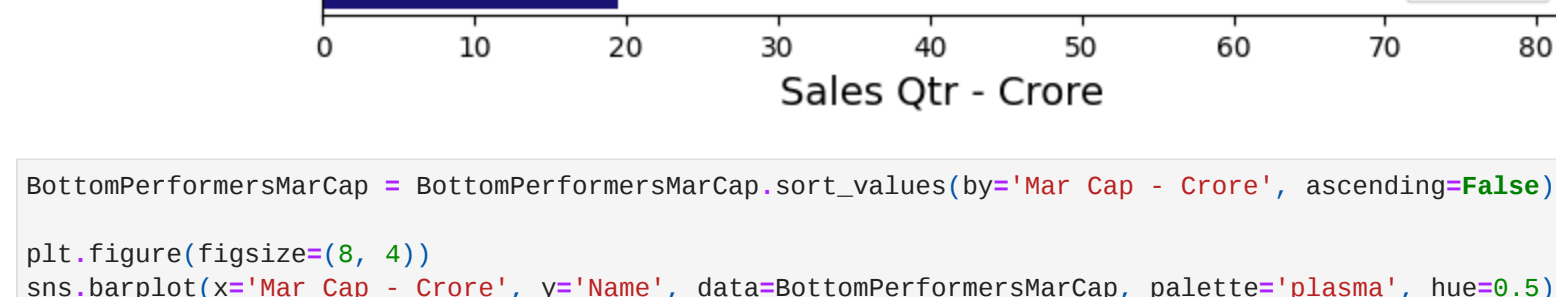
```
In [208]: TopPerformersMarCap = TopPerformersMarCap.sort_values(by='Mar Cap - Crore', ascending=False)

plt.figure(figsize=(8, 4))
sns.barplot(x='Mar Cap - Crore', y='Name', data=TopPerformersMarCap, palette='viridis', hue=0.5)
plt.title('Top 10 Performers by Market Capitalization', fontsize=16)
plt.xlabel('Market Cap - Crore', fontsize=14)
plt.ylabel('Company', fontsize=14)
plt.show()
```



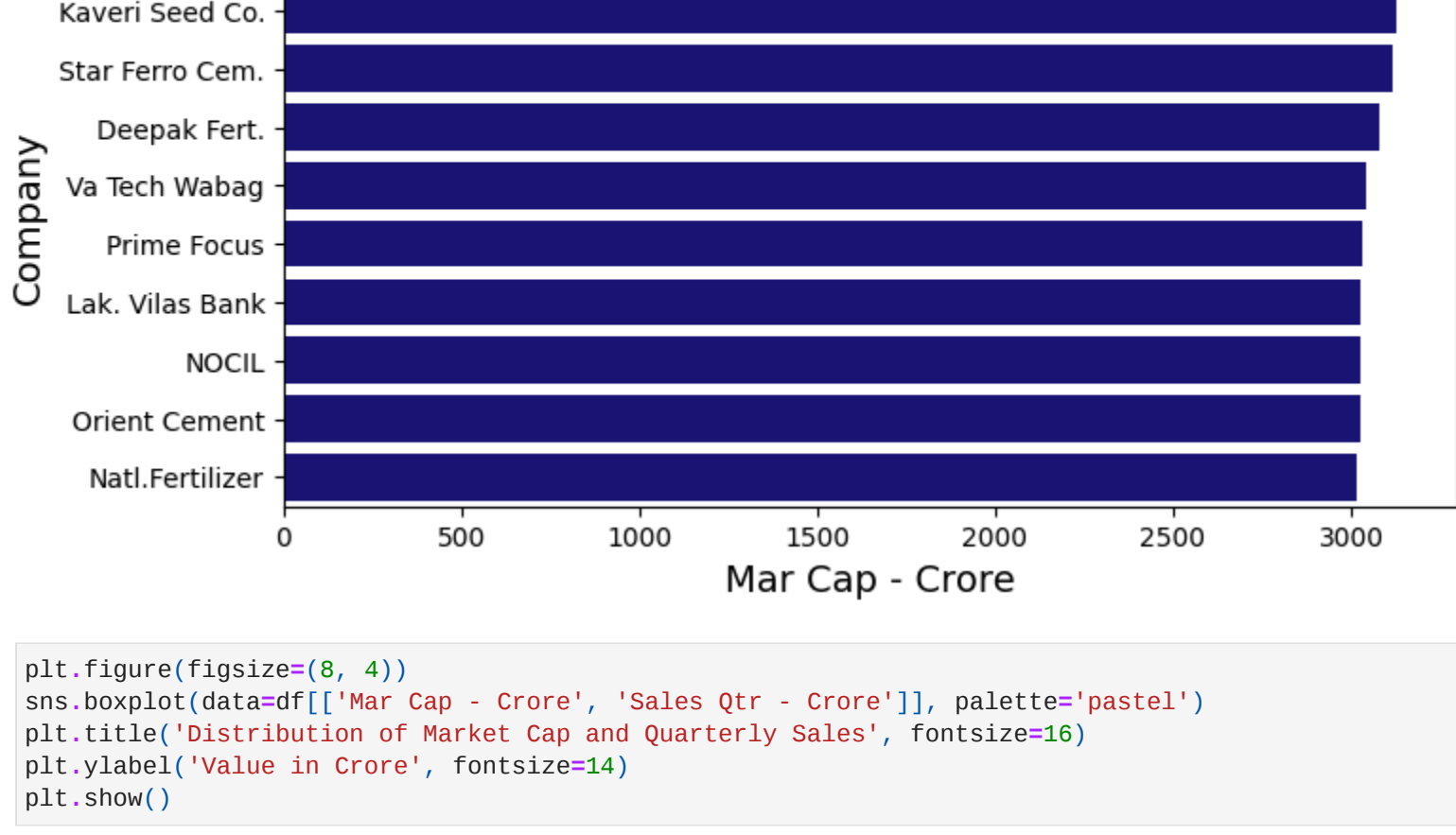
```
In [42]: BottomPerformersQtrSales = BottomPerformersQtrSales.sort_values(by='Sales Qtr - Crore', ascending=False)

plt.figure(figsize=(8, 4))
sns.barplot(x='Sales Qtr - Crore', y='Name', data=BottomPerformersQtrSales, palette='plasma', hue=0.5)
plt.title('Bottom 10 Performers by Sales Quarter', fontsize=16)
plt.xlabel('Sales Qtr - Crore', fontsize=14)
plt.ylabel('Company', fontsize=14)
plt.show()
```

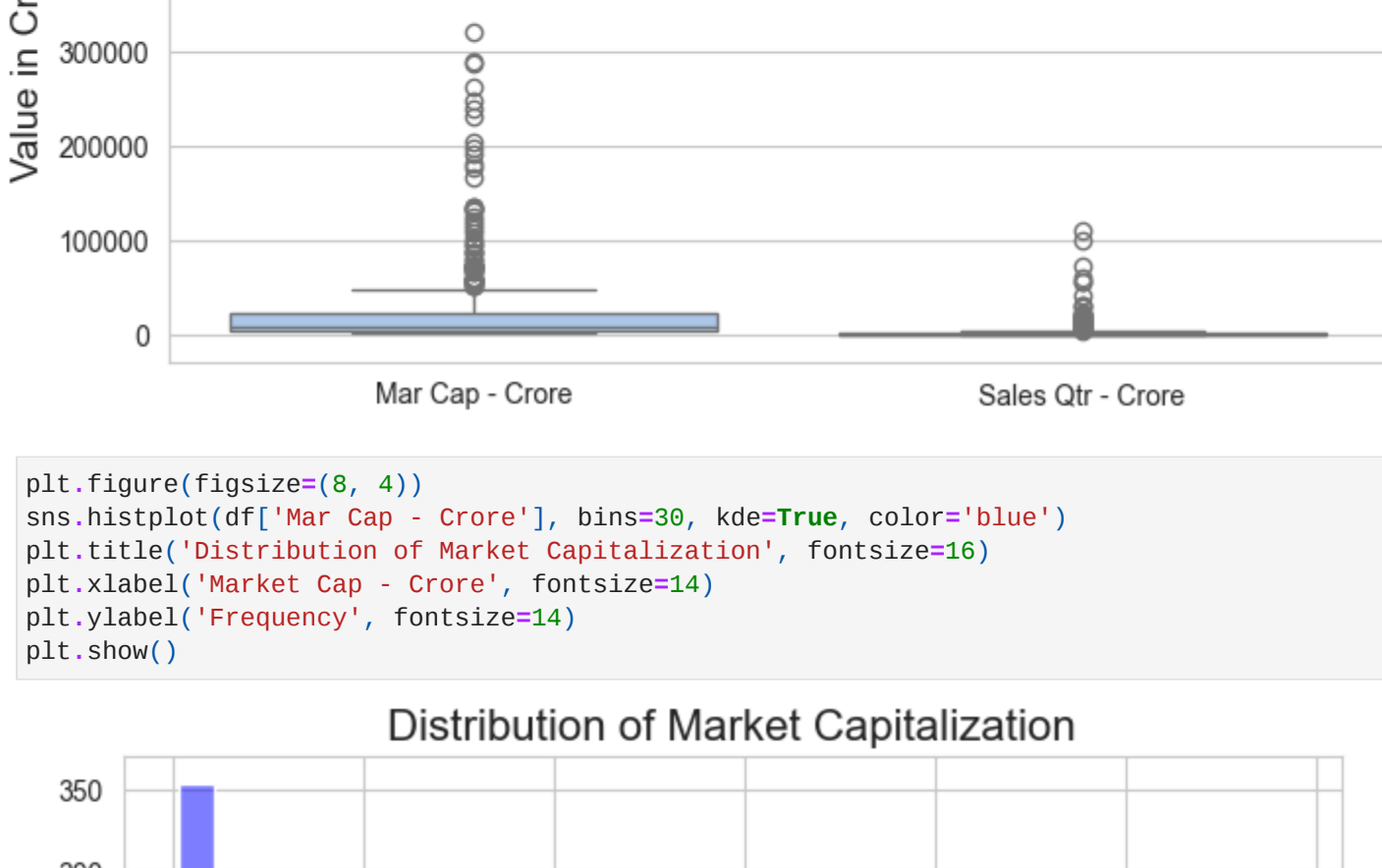


```
In [41]: BottomPerformersMarCap = BottomPerformersMarCap.sort_values(by='Mar Cap - Crore', ascending=False)

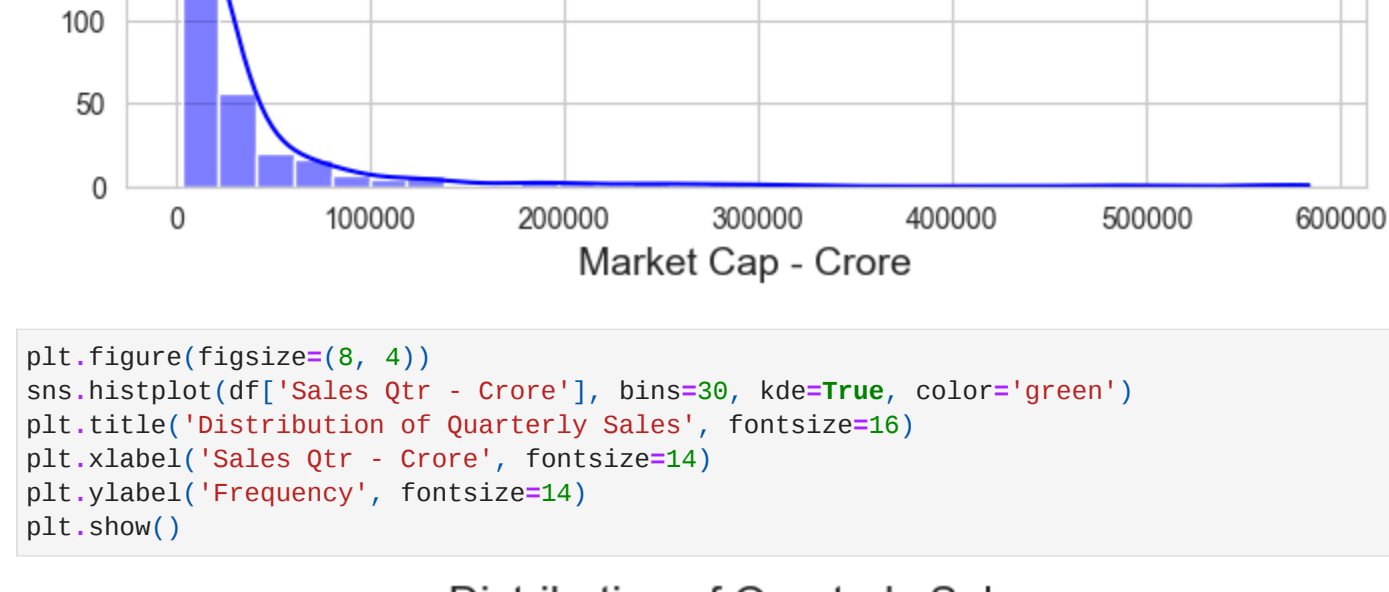
plt.figure(figsize=(8, 4))
sns.barplot(x='Mar Cap - Crore', y='Name', data=BottomPerformersMarCap, palette='plasma', hue=0.5)
plt.title('Bottom 10 Performers by Mar Cap', fontsize=16)
plt.xlabel('Mar Cap - Crore', fontsize=14)
plt.ylabel('Company', fontsize=14)
plt.show()
```



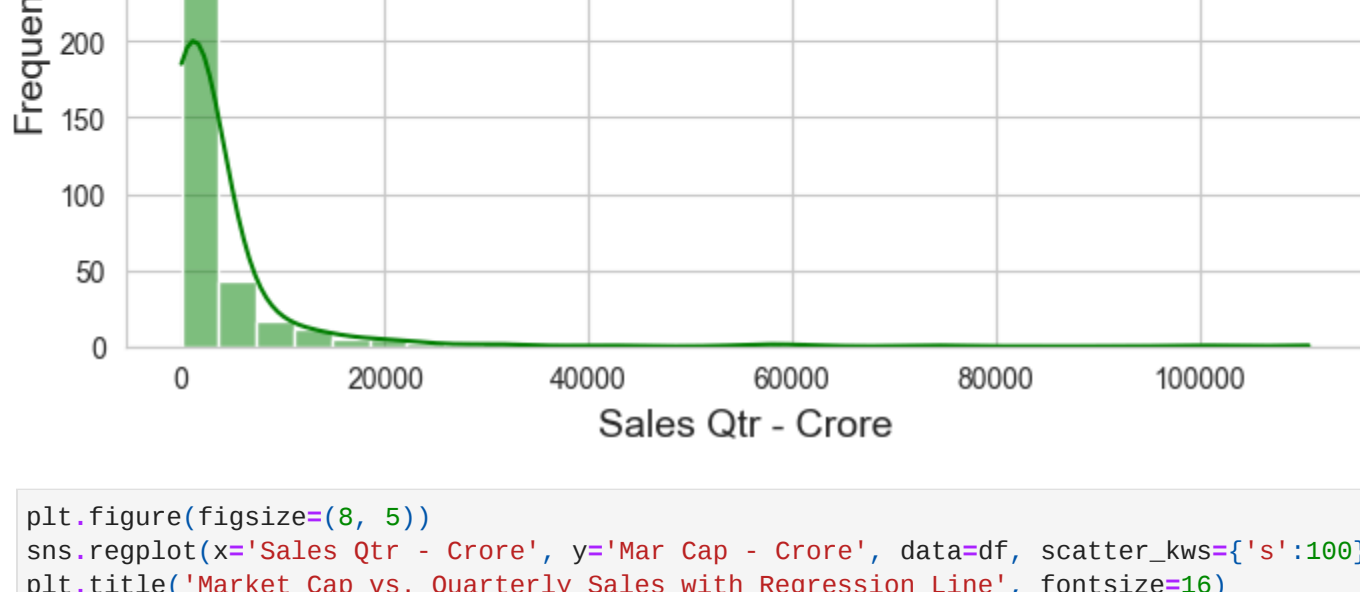
```
In [211]: plt.figure(figsize=(8, 4))
sns.boxplot(data=df[['Mar Cap - Crore', 'Sales Qtr - Crore']], palette='pastel')
plt.title('Distribution of Market Cap and Quarterly Sales', fontsize=16)
plt.xlabel('Value in Crore', fontsize=14)
plt.show()
```



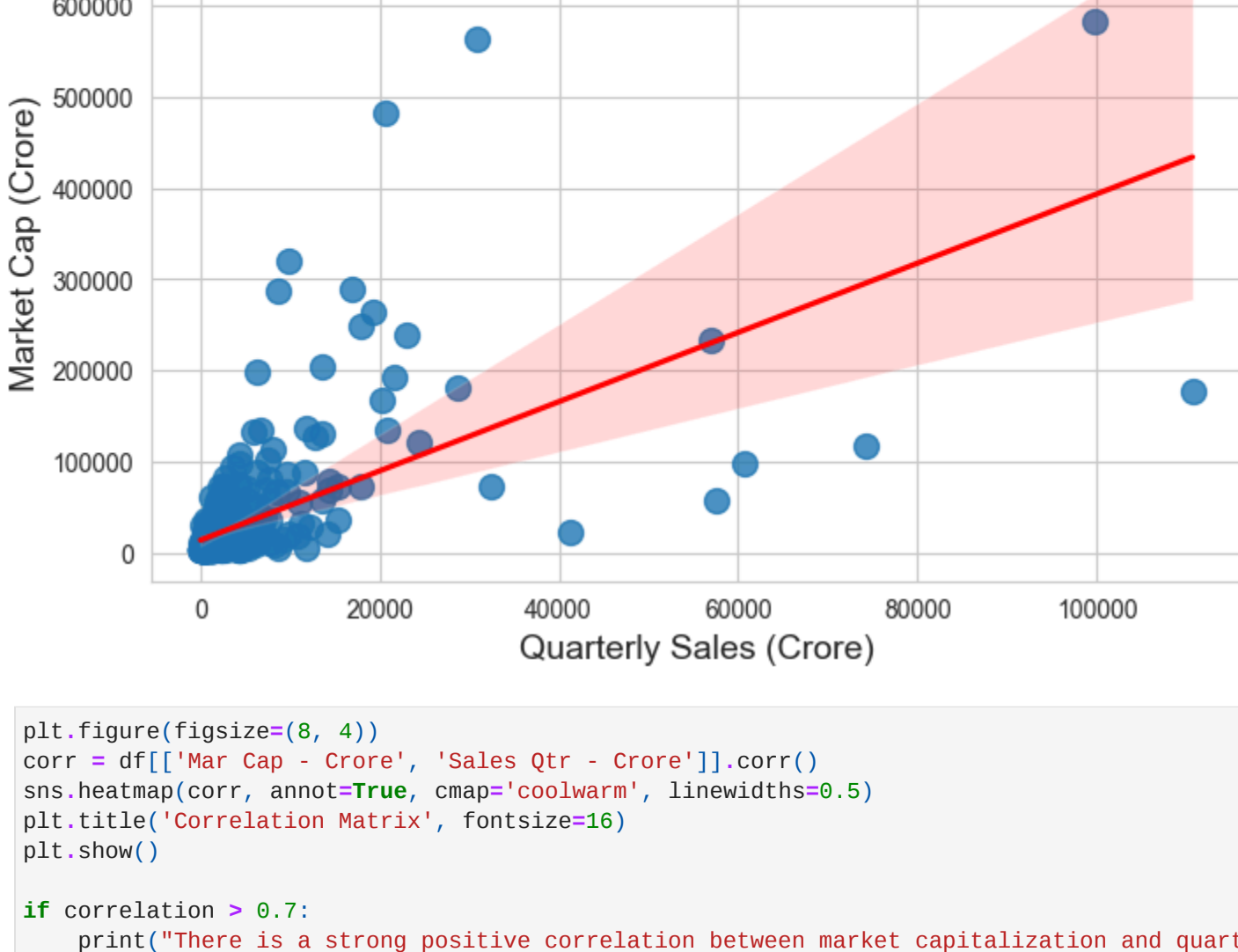
```
In [212]: plt.figure(figsize=(8, 4))
sns.histplot(df[['Mar Cap - Crore']], bins=30, kde=True, color='blue')
plt.title('Distribution of Market Capitalization', fontsize=16)
plt.xlabel('Market Cap - Crore', fontsize=14)
plt.ylabel('Frequency', fontsize=14)
plt.show()
```



```
In [213]: plt.figure(figsize=(8, 4))
sns.histplot(df[['Sales Qtr - Crore']], bins=30, kde=True, color='green')
plt.title('Distribution of Quarterly Sales', fontsize=16)
plt.xlabel('Sales Qtr - Crore', fontsize=14)
plt.ylabel('Frequency', fontsize=14)
plt.show()
```



```
In [227]: plt.figure(figsize=(8, 5))
sns.regplot(x='Sales Qtr - Crore', y='Mar Cap - Crore', data=df, scatter_kws={'s':180}, line_kws={'color':'red'})
plt.title('Market Cap vs. Quarterly Sales with Regression Line', fontsize=16)
plt.xlabel('Quarterly Sales (Crore)', fontsize=14)
plt.ylabel('Market Cap (Crore)', fontsize=14)
plt.show()
```



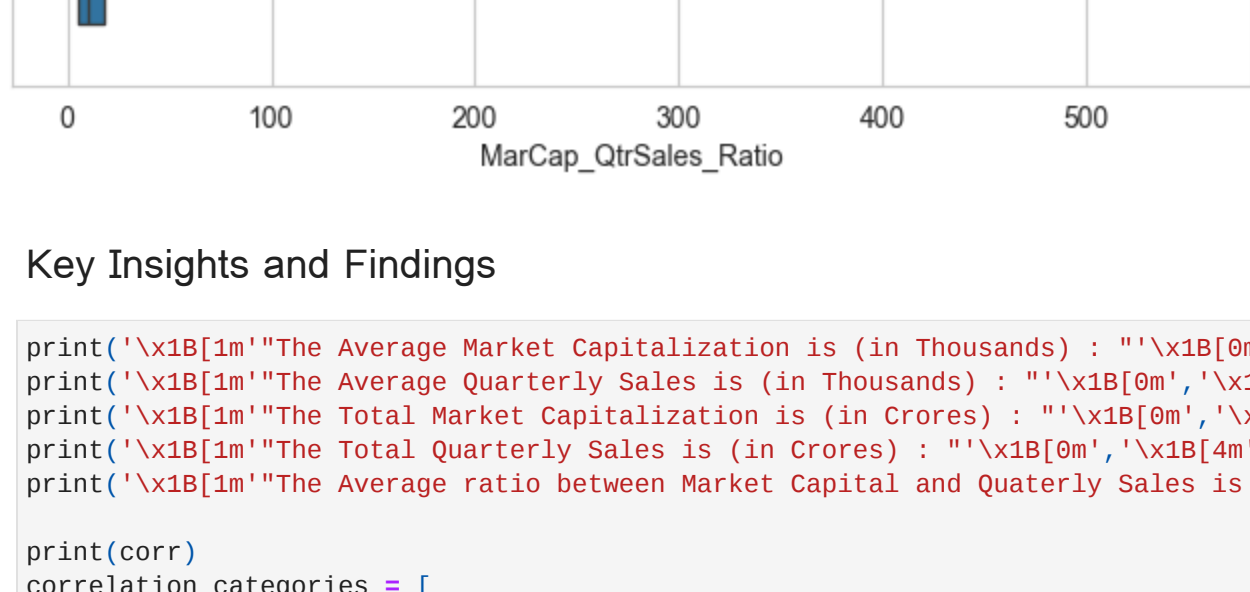
```
In [215]: plt.figure(figsize=(8, 4))
corr = df[['Mar Cap - Crore', 'Sales Qtr - Crore']].corr()
sns.heatmap(corr, annot=True, cmap='coolwarm', linewidths=0.5)
plt.title('Correlation Matrix', fontsize=16)
plt.show()

if correlation > 0.7:
    print("There is a strong positive correlation between market capitalization and quarterly sales. Companies with higher market cap tend to have higher sales.")
else:
    print("There is a weak or low significant correlation between market capitalization and quarterly sales.")
```



There is a weak or low significant correlation between market capitalization and quarterly sales.

```
In [216]: plt.figure(figsize=(8, 4))
sns.boxplot(x=df['MarCap_QtrSales_Ratio'])
plt.show()
```



Key Insights and Findings

```
In [233]: print("\x1B[3m""The Average Market Capitalization is (in Thousands) : "+"\x1B[0m","\x1B[4m",AvgMarCap,"\x1B[0m")
print("\x1B[3m""The Average Quarterly Sales is (in Thousands) : "+"\x1B[0m","\x1B[4m",AvgQtrSales,"\x1B[0m")
print("\x1B[3m""The Total Market Capitalization is (in Crores) : "+"\x1B[0m","\x1B[4m",TotalMarCap,"\x1B[0m")
print("\x1B[3m""The Total Quarterly Sales is (in Crores) : "+"\x1B[0m","\x1B[4m",TotalQtrSales,"\x1B[0m")
print("\x1B[3m""The Average ratio between Market Capital and Quarterly Sales is : "+"\x1B[0m","\x1B[4m",AvgRatio,"\x1B[0m")

print(corr)
correlation_categories = [
    "Strong positive correlation: 0.7 - 1.0",
    "Moderate positive correlation: 0.5 - 0.7",
    "Weak positive correlation: 0.3 - 0.5",
    "No or weak correlation: 0 - 0.3"
]

for category in correlation_categories:
    print("\x1B[3m",category,"\x1B[0m")

if correlation > 0.7:
    print("\x1B[3m""There is a strong positive correlation between market capitalization and quarterly sales. Companies with higher market cap tend to have higher sales.""\x1B[0m")
else:
    print("\x1B[3m""There is a weak or low significant correlation between market capitalization and quarterly sales.""\x1B[0m")

The Average Market Capitalization is (in Thousands) : 28043.85718997912
The Average Quarterly Sales is (in Thousands) : 3816.1833624454153
The Total Market Capitalization is (in Crores) : 13433087.56
The Total Quarterly Sales is (in Crores) : 1747775.3409080003
The Average ratio between Market Capital and Quarterly Sales is : 15.334604811015371

Mar Cap - Crore      2.809998      0.625998
Sales Qtr - Crore    0.625998      1.000000

Strong positive correlation: 0.7 - 1.0
Moderate positive correlation: 0.5 - 0.7
Weak positive correlation: 0.3 - 0.5
```

