

Bi-Variate Analysis

```
[16]: import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

file_path = 'C:\\Users\\DELL\\Desktop\\Data Analytics\\DataSets\\Cleaned - Assignment.xlsx'
Data = pd.read_excel(file_path)
print(Data)
```

| | Company Name | Model | Battery Power (Mah) | |
|-----|--------------|------------------------------|---------------------|--|
| 0 | Micromax | BOLT S301 3G Without Charger | 1200 | |
| 1 | Karbonn | A52 plus | 1300 | |
| 2 | Karbonn | A52 plus | 1300 | |
| 3 | Karbonn | A40 Indian | 1400 | |
| 4 | Lava | Iris Atom X | 1400 | |
| .. | ... | ... | ... | |
| 979 | Samsung | Galaxy M21 | 6000 | |
| 980 | Samsung | Galaxy M31 | 6000 | |
| 981 | Samsung | Galaxy M21 | 6000 | |
| 982 | Asus | ROG Phone II | 6000 | |
| 983 | Asus | ROG Phone 3 | 6000 | |

| | Battery Type | Battery Performance | Rear Camera Type | Front Camera Type | |
|-----|-----------------|---------------------|------------------|-------------------|--|
| 0 | Normal | Low | Single Camera | Not Available | |
| 1 | lithium-ion | Low | Single Camera | Not Available | |
| 2 | lithium-ion | Low | Single Camera | Not Available | |
| 3 | Normal | Low | Single Camera | Single Camera | |
| 4 | lithium-ion | Low | Single Camera | Single Camera | |
| .. | ... | ... | ... | ... | |
| 979 | Normal | Extremely High | Multiple Cameras | Single Camera | |
| 980 | Normal | Extremely High | Multiple Cameras | Single Camera | |
| 981 | Normal | Extremely High | Multiple Cameras | Single Camera | |
| 982 | Normal | Extremely High | Multiple Cameras | Single Camera | |
| 983 | lithium-polymer | Extremely High | Multiple Cameras | Single Camera | |

| | Display in Cms. | Display Type | RAM (GB) | ROM (GB) | Expandable Upto (GB) | |
|-----|-----------------|--------------|----------|----------|----------------------|--|
| 0 | 8.89 | FWVGA | 0.50 | 4.0 | 0.0 | |
| 1 | 8.89 | HVGA | 0.50 | 4.0 | 32.0 | |
| 2 | 8.89 | HVGA | 0.50 | 4.0 | 32.0 | |
| 3 | 10.16 | NORMAL | 1.00 | 8.0 | 32.0 | |
| 4 | 10.16 | WVGA | 0.25 | 0.5 | 32.0 | |
| .. | ... | ... | ... | ... | ... | |
| 979 | 16.26 | FULL HD+ | 6.00 | 128.0 | 512.0 | |

| | | | | | | |
|-----|-----|----------------|-------|-----|------|--------------------|
| 1 | Yes | black & gold | 3290 | 3.6 | 555 | Warranty Available |
| 2 | Yes | white & silver | 2741 | 3.6 | 555 | Warranty Available |
| 3 | Yes | black | 2499 | 3.6 | 183 | Warranty Available |
| 4 | Yes | black | 1999 | 3.2 | 252 | Warranty Available |
| .. | ... | ... | ... | ... | ... | ... |
| 979 | Yes | raven black | 17987 | 4.3 | 11 | Warranty Available |
| 980 | Yes | ocean blue | 19948 | 4.4 | 78 | Warranty Available |
| 981 | Yes | midnight blue | 17986 | 4.3 | 11 | Warranty Available |
| 982 | No | black | 39999 | 4.6 | 1918 | Warranty Available |
| 983 | No | black | 49999 | 4.5 | 205 | Warranty Available |

[984 rows x 18 columns]

```
[17]: Data.head()
```

```
[17]:
```

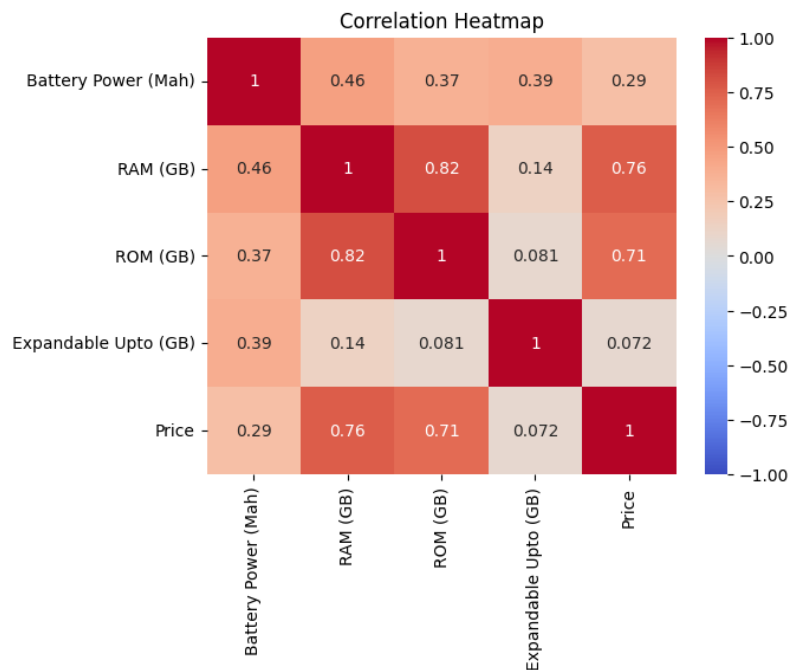
| | Company Name | Model | Battery Power (Mah) | Battery Type | Battery Performance | Rear Camera Type | Front Camera Type | Display in Cms. | Display Type | RAM (GB) | ROM (GB) | Expandable Upto (GB) | Expandability | Colour | Price | Ratings | Reviews |
|---|--------------|------------------------------|---------------------|--------------|---------------------|------------------|-------------------|-----------------|--------------|----------|----------|----------------------|---------------|----------------|-------|---------|---------|
| 0 | Micromax | BOLT S301 3G Without Charger | 1200 | Normal | Low | Single Camera | Not Available | 8.89 | FWVGA | 0.50 | 4.0 | 0.0 | No | black | 2399 | 2.9 | 27 |
| 1 | Karbonn | A52 plus | 1300 | lithium-ion | Low | Single Camera | Not Available | 8.89 | HVGA | 0.50 | 4.0 | 32.0 | Yes | black & gold | 3290 | 3.6 | 555 |
| 2 | Karbonn | A52 plus | 1300 | lithium-ion | Low | Single Camera | Not Available | 8.89 | HVGA | 0.50 | 4.0 | 32.0 | Yes | white & silver | 2741 | 3.6 | 555 |
| 3 | Karbonn | A40 Indian | 1400 | Normal | Low | Single Camera | Single Camera | 10.16 | NORMAL | 1.00 | 8.0 | 32.0 | Yes | black | 2499 | 3.6 | 183 |
| 4 | Lava | Iris Atom X | 1400 | lithium-ion | Low | Single Camera | Single Camera | 10.16 | WVGA | 0.25 | 0.5 | 32.0 | Yes | black | 1999 | 3.2 | 252 |

| | Battery Power (Mah) | RAM (GB) | ROM (GB) |
|----------------------|---------------------|----------|----------|
| Battery Power (Mah) | 1.000000 | 0.463649 | 0.372069 |
| RAM (GB) | 0.463649 | 1.000000 | 0.815078 |
| ROM (GB) | 0.372069 | 0.815078 | 1.000000 |
| Expandable Upto (GB) | 0.394699 | 0.136148 | 0.080733 |
| Price | 0.288851 | 0.759507 | 0.708302 |

| | Expandable Upto (GB) | Price |
|----------------------|----------------------|----------|
| Battery Power (Mah) | 0.394699 | 0.288851 |
| RAM (GB) | 0.136148 | 0.759507 |
| ROM (GB) | 0.080733 | 0.708302 |
| Expandable Upto (GB) | 1.000000 | 0.072450 |
| Price | 0.072450 | 1.000000 |

| | Battery Power (Mah) | RAM (GB) | ROM (GB) | |
|----------------------|----------------------|-----------|-----------|--|
| Battery Power (Mah) | 1.000000 | 0.463649 | 0.372069 | |
| RAM (GB) | 0.463649 | 1.000000 | 0.815078 | |
| ROM (GB) | 0.372069 | 0.815078 | 1.000000 | |
| Expandable Upto (GB) | 0.394699 | 0.136148 | 0.080733 | |
| Reviews | 0.101294 | -0.083594 | -0.098776 | |
| Ratings | 0.251953 | 0.122424 | 0.113881 | |
| | Expandable Upto (GB) | Reviews | Ratings | |
| Battery Power (Mah) | 0.394699 | 0.101294 | 0.251953 | |
| RAM (GB) | 0.136148 | -0.083594 | 0.122424 | |
| ROM (GB) | 0.080733 | -0.098776 | 0.113881 | |
| Expandable Upto (GB) | 1.000000 | 0.071437 | 0.181546 | |
| Reviews | 0.071437 | 1.000000 | 0.157390 | |
| Ratings | 0.181546 | 0.157390 | 1.000000 | |

```
[36]: sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm', vmin=-1, vmax=1)
plt.title('Correlation Heatmap')
plt.show()
```



```
[32]: sns.heatmap(correlation_matrix2, annot=True, cmap='coolwarm', vmin=-1, vmax=1)
plt.title('Correlation Heatmap 2')
plt.show()
```

