



Lambton
College

A Report On: -

Statistical Analysis of Numerical Values

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Introduction:

The mobile phone industry has seen rapid advancements in technology, leading to a diverse range of devices with varying specifications. Understanding the key features of these devices is crucial for both manufacturers and consumers. This report presents a statistical analysis of two important numerical features: 'battery_power' and 'clock_speed', extracted from a dataset of mobile phones. The analysis aims to provide insights into the distribution and characteristics of these features.

Objectives:

The main objectives of this statistical analysis are:

- To analyze the **battery_power** feature of mobile phones, focusing on its central tendency, dispersion, and distribution.
- To analyze the **clock_speed** feature of mobile phones, focusing on its central tendency, dispersion, and distribution.

Analysis:

Analysis on battery_power:

Analysis on Excel:

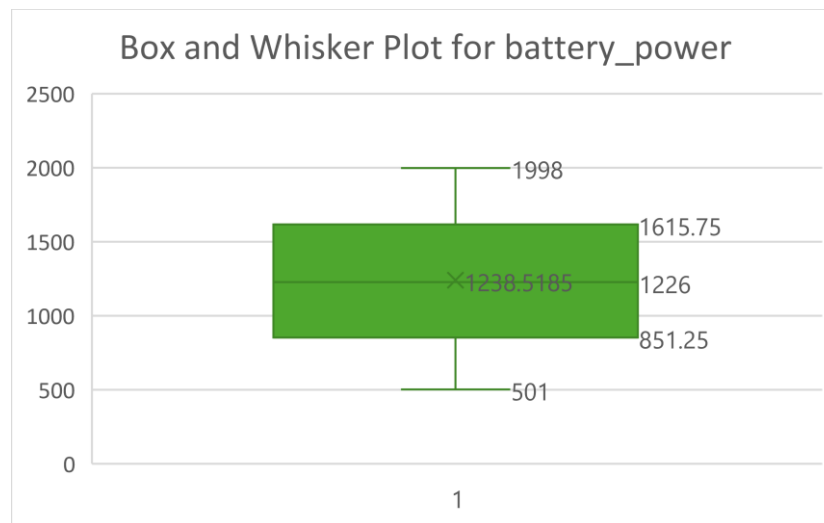
This feature represents the battery capacity of the mobile phones in milliamp hours (mAh). The following statistics were calculated:

Summary Statistics:

<i>battery_power</i> Summary	
Mean	1238.5185
Standard Error	9.825689794
Median	1226
Mode	1589
Standard Deviation	439.4182061
Sample Variance	193088.3598
Kurtosis	-1.224143883
Skewness	0.031898472
Minimum	501
Maximum	1998
Count	2000

Percentiles:

<i>battery_power</i> Percentile	
10%	634.9
25%	851.75
50%	1226
75%	1615.25
90%	1851
99%	1987

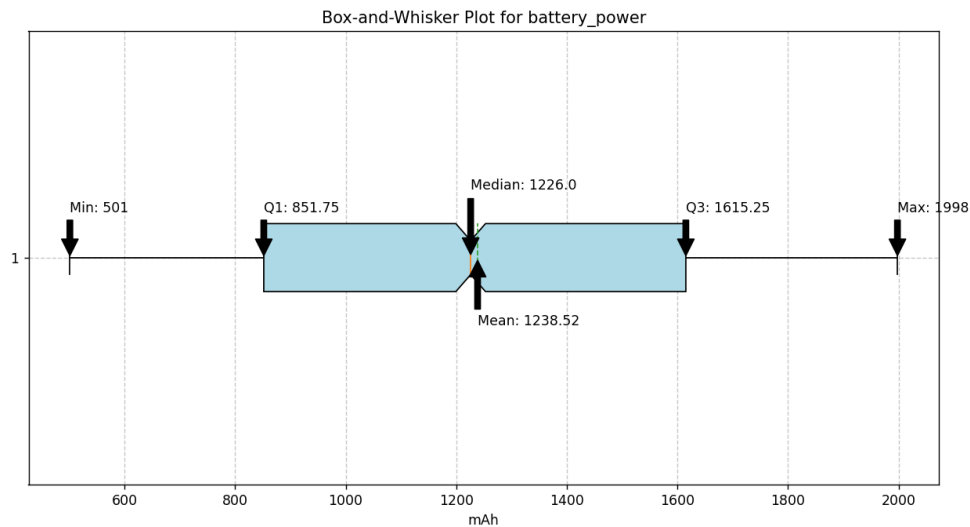
Box and Whisker:*Analysis on Python:***Summary Statistics:**

```
Summary Statistics for battery_power:
Mean: 1238.52 mAh
Standard Error: 9.83
Median: 1226.0 mAh
Mode: 618 mAh
Standard Deviation: 439.42 mAh
Sample Variance: 193088.36
Kurtosis: -1.22
Skewness: 0.03
Range: 1497 mAh
Minimum: 501 mAh
Maximum: 1998 mAh
Count: 2000
```

Percentiles:

```
Percentiles for Battery Power:
10th Percentile: 634.9 mAh
25th Percentile: 851.75 mAh
50th Percentile (Median): 1226.0 mAh
75th Percentile: 1615.25 mAh
90th Percentile: 1851.00 mAh
99th Percentile: 1987.00 mAh
```

Box and Whisker in Python:



Analysis:

The mean battery power of the mobile phones is 1238.52 mAh, with a median value of 1226 mAh, indicating a symmetrical distribution. The mode of 1589 mAh suggests that this value appears most frequently in the dataset. The standard deviation of 439.42 mAh reflects a considerable spread around the mean. The negative kurtosis (-1.22) indicates a flatter distribution compared to a normal distribution. The skewness value (0.03) close to zero suggests a nearly symmetric distribution of battery power. The percentile values show the distribution of battery power across different points in the dataset. Also, the box and whisker showed **no outliers** in this feature.

Analysis on clock_speed:

This feature represents the processor speed of the mobile phones in gigahertz (GHz). The following statistics were calculated.

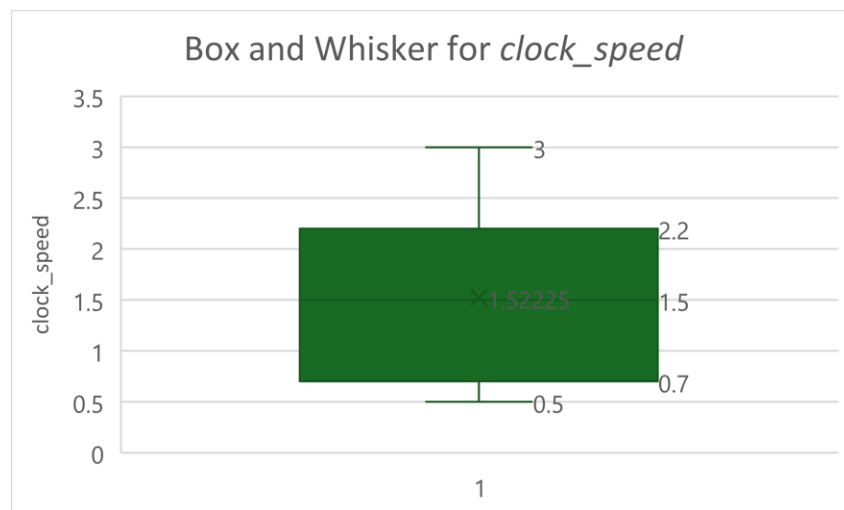
Summary Statistics:

<i>clock_speed Summary</i>	
Mean	1.52225
Standard Error	0.018246409
Median	1.5
Mode	0.5
Standard Deviation	0.816004209
Sample Variance	0.665862869
Kurtosis	-1.323417222
Skewness	0.17808412

Minimum	0.5
Maximum	3
Count	2000

Percentiles:

<i>clock_speed</i> Percentile	
10%	0.5
25%	0.7
50%	1.5
75%	2.2
90%	2.7
99%	3

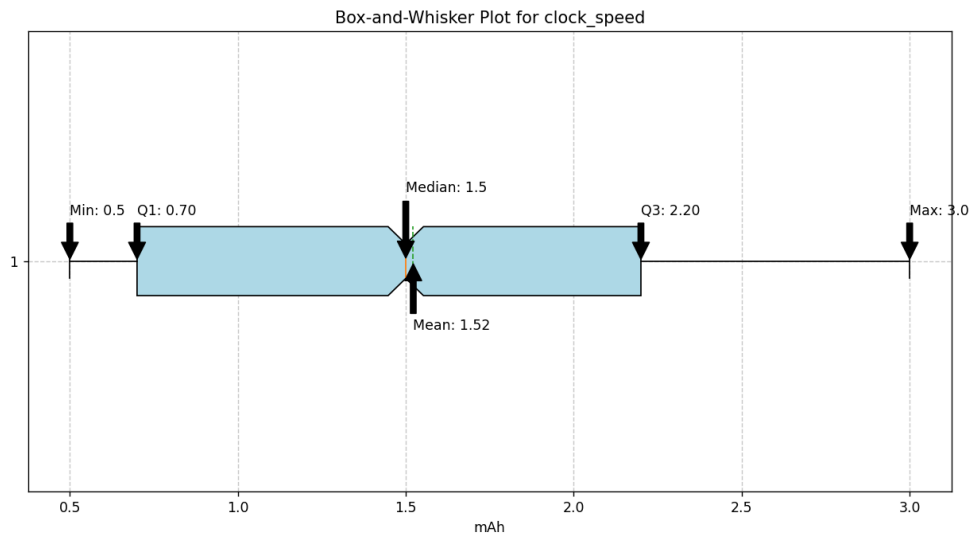
Box and Whisker:*Analysis on Python:***Summary Statistics:**

```
Summary Statistics for clock_speed:
Mean: 1.52 mAh
Standard Error: 0.02
Median: 1.5 mAh
Mode: 0.5 mAh
Standard Deviation: 0.82 mAh
Sample Variance: 0.67
Kurtosis: -1.32
Skewness: 0.18
Range: 2.5 mAh
Minimum: 0.5 mAh
Maximum: 3.0 mAh
Count: 2000
```

Percentiles:

```
Percentiles for Battery Power:
10th Percentile: 0.5 mAh
25th Percentile: 0.70 mAh
50th Percentile (Median): 1.5 mAh
75th Percentile: 2.20 mAh
90th Percentile: 2.70 mAh
99th Percentile: 3.00 mAh
```

Box and Whisker on Python:



Analysis:

The mean clock speed of the mobile phones is 1.52 GHz, with a median value of 1.5 GHz, indicating a balanced distribution around the central value. The mode of 0.5 GHz is notably lower than the mean and median, suggesting a significant number of devices with lower clock speeds. The standard deviation of 0.82 GHz indicates moderate variability around the mean. The negative kurtosis (-1.32) implies a flatter distribution than the normal distribution. The skewness value (0.18) indicates a slight right skew in the distribution. The percentile values illustrate the distribution of clock speeds at various points in the dataset. Also, the box and whisker showed **no outliers** in this feature.

Excel Vs Python:

Statistics	<i>battery_power</i>		<i>clock_speed</i>	
	Excel	Python	Excel	Python
Mean	1238.5185	1238.52	1.52225	1.52
Standard Error	9.825689794	9.83	0.018246	0.02
Median	1226	1226	1.5	1.5
Mode	1589	1589	0.5	0.5
Standard Deviation	439.4182061	439.42	0.816004	0.82
Sample Variance	193088.3598	193088.4	0.665863	0.67
Kurtosis	-1.224143883	-1.22	-1.32342	-1.32
Skewness	0.031898472	0.03	0.178084	0.18
Minimum	501	501	0.5	0.5
Maximum	1998	1998	3	3
Count	2000	2000	2000	200
10%	634.9	634.9	0.5	0.5
25%	851.75	851.75	0.7	0.7
50%	1226	1226	1.5	1.5
75%	1615.25	1615.25	2.2	2.2
90%	1851	1851	2.7	2.7
99%	1987	1987	3	3

Conclusion

This statistical analysis provides a comprehensive overview of the *battery_power* and *clock_speed* features in the mobile phone dataset. The insights gained from this analysis can inform manufacturers about common battery capacities and processor speeds, helping them make data-driven decisions in product development and marketing.