# Project Summary

1. INTRODUCTION

In this project, we explore the relationship between mobile price and battery capacity. We use a dataset from Kaggle that contains information about different mobile brands and their prices and battery capacities. This topic is interesting because mobile phones have various features and capabilities, and we want to see if there is a correlation between how much they cost and how long their batteries last. Our research question is: How does battery capacity affect mobile price? Our null hypothesis is that there is no relationship between battery capacity and mobile price, and our alternative hypothesis is that there is a relationship between them. We use linear regression to test our hypothesis and analyse the data.

2. EXPLORATORY DATA ANALYSIS

Summary Statistics

P-value	2.2e-16
F-statistic	106.3 on 1 and 405 degrees of freedom
Residual standard Error	0.5736 on 405 degress of freedom

This is a Scatter plot between price and battery capacity of mobile
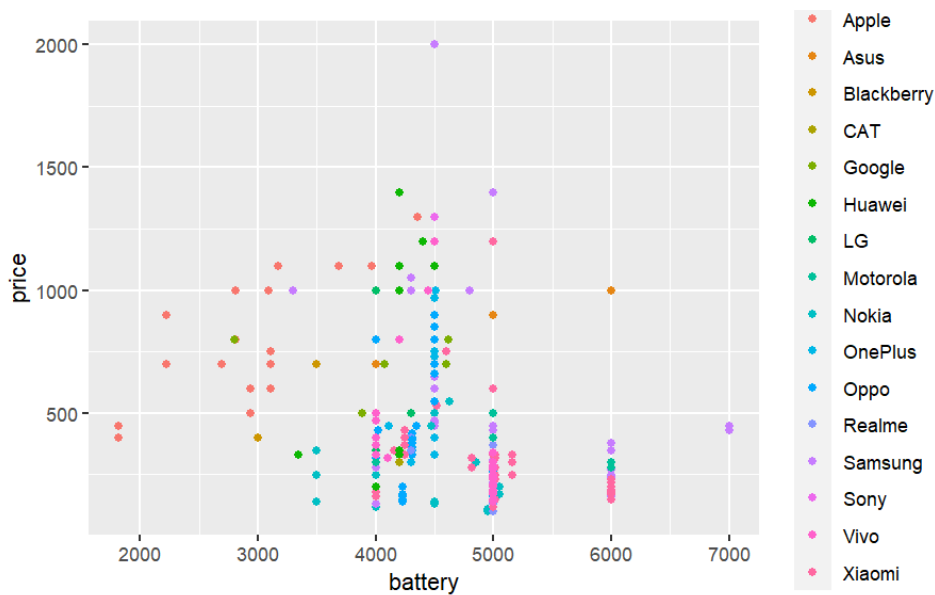
It's evident from the graph that there is a positive linearity between the price and battery capacity. As the battery capacity increases, the price also tends to rise. This positive correlation could be attributed to the fact that higher battery capacity is perceived as a desirable feature in a mobile phone. Consequently, manufacturers are likely to charge a premium for devices with increased battery capacity due to the perceived value and enhanced user experience associated with longer battery life.

3. RESULTS

We employed a simple linear regression model to conduct the hypotheses, and the conditions for it are as follows:

Linearity: The assumption is that the relationship between battery and price is linear.

Independence: It is assumed that observations are independent. Specifically, the value of battery for one observation should not predict the value of price for another observation.

Homoscedasticity: The variability of price is expected to be constant across all levels of battery. Put differently, the spread of residuals should remain roughly constant as the battery changes.

Normality of Residuals: The residuals, representing the differences between the observed and predicted values, should exhibit an approximately normal distribution.

However, since normality is violated, we opted to take the logarithmic form for the price. Subsequently, the normality assumption is satisfied.

In conclusion, the analysis of the data has led to a decisive outcome. The calculated p-value, which is significantly lower than the predetermined alpha value, provides robust evidence to reject the null hypothesis. This rejection suggests a clear association between battery capacity and the price of the mobile device. Therefore, based on the statistical findings, it can be inferred that the price of the mobile is indeed dependent on its battery capacity.

4. CONCLUSION

In this study, we investigated the relationship between the price and the battery capacity of different mobile phones. We collected data from various sources and performed a linear regression analysis to test our hypothesis. We found that there was a positive correlation between the price and the battery capacity, meaning that more expensive phones tend to have higher battery capacity. However, our study had some limitations, such as the fact that some phones with different specifications had the same battery capacity, which could affect the accuracy of our results. Therefore, we suggest that future studies should control for other factors that may influence the price and the battery performance of mobile phones. Our study has important implications for consumers and manufacturers, as it shows that battery capacity is one of the factors that determine the value of a mobile phone. Based on our results, we recommend that consumers should consider their needs and preferences when choosing a mobile phone, and that manufacturers should improve their battery technology to offer more competitive products.