Homework N3

Instructions:

Submit your homework ONLY in the following formats:

> HTML or PDF file for R solutions / .ipynb file for Python solutions
>
> Submit your homework on GitHub and provide the link in Moodle as a comment.

Note that any form of collaboration will be considered cheating and will result in a grade of 0. Improving your grade with challenge datasets will not be possible.

Overview of the dataset:

The *mobiles_dataset.csv* contains detailed specifications and official launch prices of various mobile phone models from different companies. It provides insights into smartphone hardware, pricing trends, and brand competitiveness across multiple countries. The dataset includes key features such as RAM, camera specifications, battery capacity, processor details, and screen size.

One important aspect of this dataset is the pricing information. The recorded prices represent the official launch prices of the mobile phones at the time they were first introduced in the market. Prices vary based on the country and the launch period, meaning older models reflect their original launch prices, while newer models include their most recent launch prices.

- Company Name: The brand or manufacturer of the mobile phone.
- Model Name: The specific model of the smartphone.
- Mobile Weight: The weight of the mobile phone (in grams).
- RAM: The amount of Random Access Memory (RAM) in the device (in GB).
- Front Camera: The resolution of the front (selfie) camera (in MP).
- Back Camera: The resolution of the primary rear camera (in MP).
- Processor: The chipset or processor used in the device.
- Battery Capacity: The battery size of the smartphone (in mAh).
- Screen Size: The display size of the smartphone (in inches).
- Launched Price: (Pakistan, India, China, USA, Dubai): The official launch price of the mobile in the respective country at the time of its release. Prices vary based on the year the mobile was launched.
- Launched Year: The year the mobile phone was officially launched.

Part 1: Analytical Questions (Python & R)

> *Hint: Convert all the currencies to dollars using the following logic:*
> 1 PKR = 0.0036 USD
> 1 INR = 0.011 USD
> 1 CNY = 0.14 USD
> 1 AED = 0.27 USD

1. Does battery capacity influence the launched price of a smartphone? Check this variability across all currencies. Is there any type of difference between behaviors?
2. Does RAM size impact the price of smartphones? Check this variability across all currencies. Is there any type of difference between behaviors?
3. Do Apple devices have a higher price variation across different regions compared to other brands? In which country do Apple devices have the highest markup? Are there brands with more stable pricing across regions?
4. Do all smartphone brands have flagship and budget-friendly models, or do some brands only focus on premium devices?
   Hint: Categorize brands into budget, mid-range, and premium segments (Budget: < $300, Mid-range: $300 - $700, Premium: > $700). Check how many models each brand has in each segment. Determine whether a brand covers all three segments or focuses only on premium/mid-range.
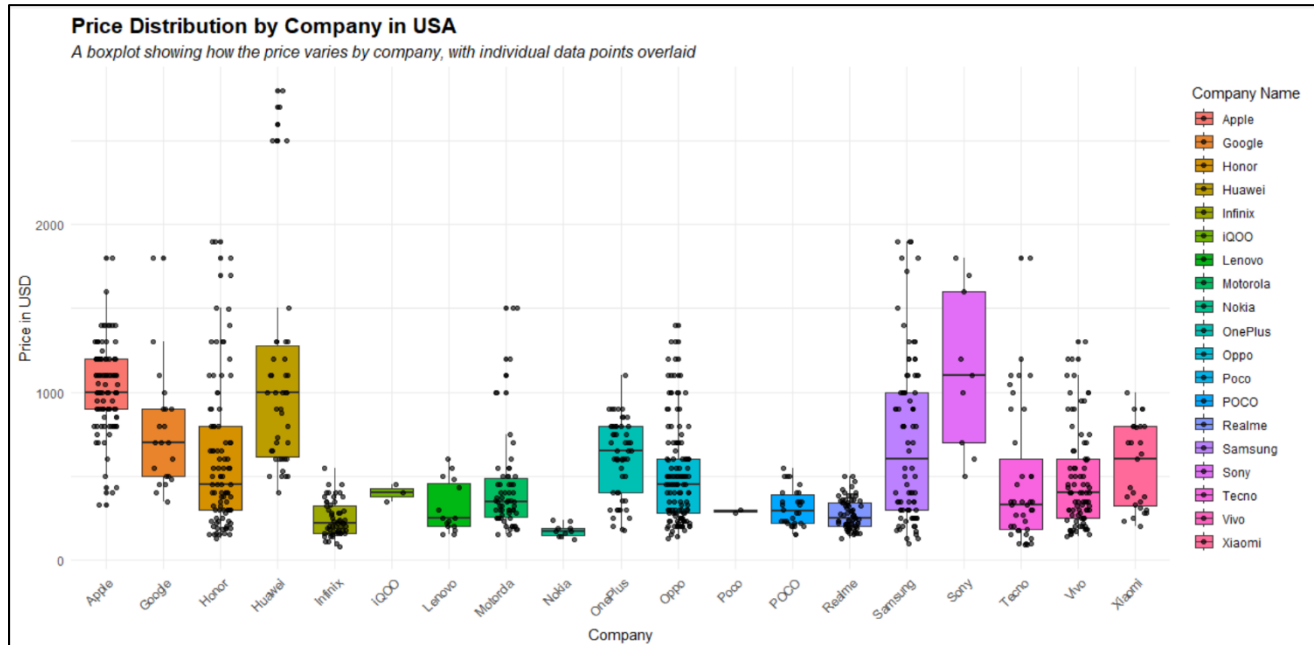5. Which region offers the most affordable smartphone prices on average? Are there any brands that price their phones significantly lower in one region compared to others?
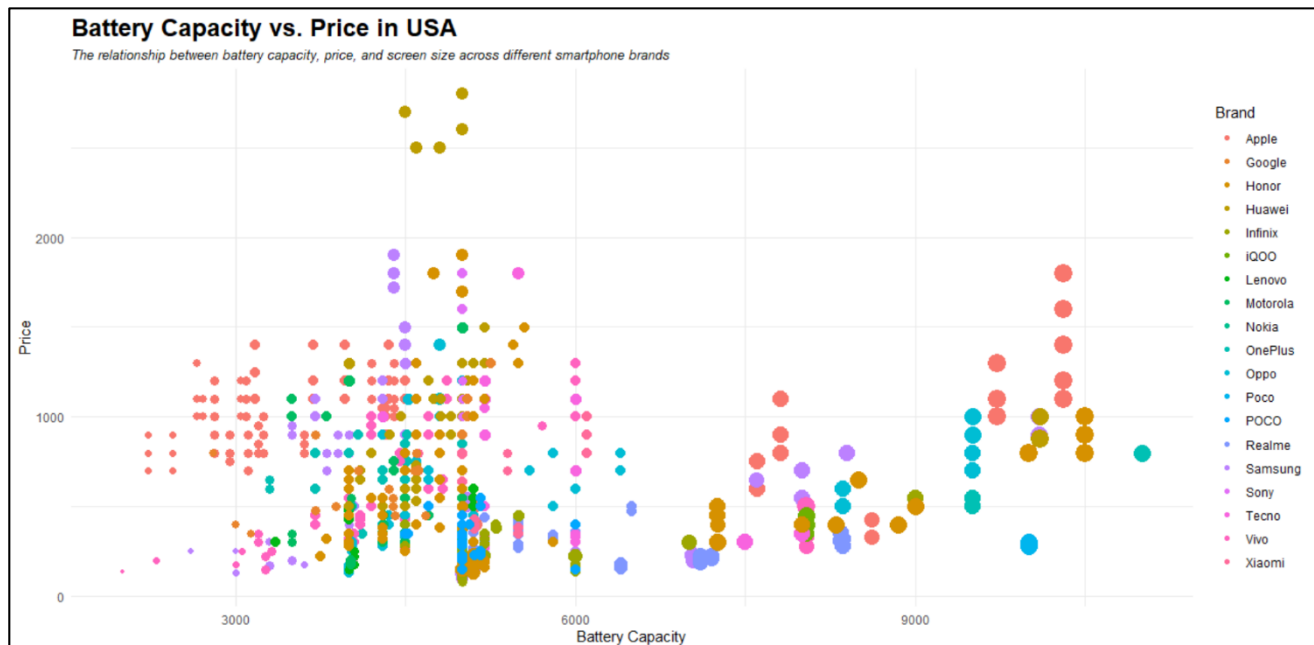
Part 2: Visualization (Python & R)

1. Plot a bar chart for average price per region in USD.
2. 2. Create a pie chart of the market share of smartphone brands.

Part 3: Recreate (R only)

1.

2.

3.

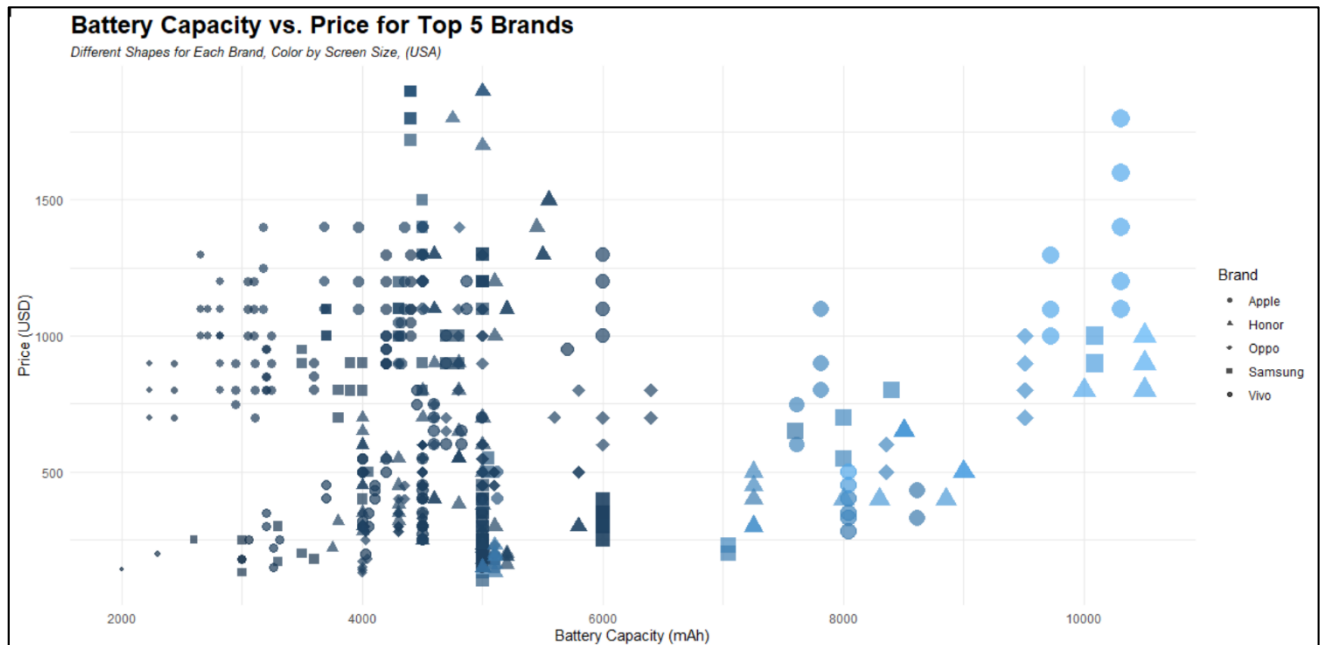## Part 4: Personal findings

Using either R or Python, explain what else affects the prices of mobile phones. Summarize your findings.