

# **COMPARISON OF SMARTPHONE SPECIFICATIONS USING BENCHMARK RATING AND REVIEWS**

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smartphones with the help of visualization techniques to find a decent smartphone.

## **Introduction**

Smartphones are gadgets used by people for their daily and everyday life. The value of a smartphone in a person's life is incalculable. With the technical advances in the mobile industry, choosing a smartphone as our daily driver is becoming increasingly difficult. Every year, numerous companies launch over 3000 smartphones all over the world. Because of the vast number of smartphones available, it is currently difficult for anyone in the world to pick their favorite smartphone that meets basic criteria such as a good processor, a good battery, and a good camera. An average consumer is often not sure which definitions are best. Even for someone who enjoys using a smartphone, it can sometimes be difficult to keep track of data and specifications. However, we can evaluate the overall phone performance using Geek's benchmark ratings. Using these benchmark results, we can compare the features of various

## **Literature Review**

### **Processors**

Smart phones have evolved into advanced devices with a diverse range of applications. They mimic super minicomputer systems in some respects, but not in others. Real-time and basic artificial intelligence applications can now be run on the processors. The core processor is the brain of the smartphone operations. The processor can be assumed as an epicenter or the nucleus of a cell phone. Every smartphone and tablet in today's modern world rely

on processors to carry out every task. Processors became an important factor in selecting any type of computing device. Every processor is made up of single or multiple cores which are responsible for implementing and executing tasks. More the number of cores, more and heavier apps it can run simultaneously. Each processor differentiates itself from the other by 5 bits speed i.e. how fast a processor completes operations. This is known as the clock speed of the processor and is usually measured in megahertz and gigahertz.

## **Mobile Operating Systems**

A smartphone operating system is a software platform on top of which other programs can run on smartphones. Smartphone OS design has experienced a three-phase evolution: PC-based, embedded and smartphone-oriented. Throughout the process, Mobile OS architecture has gone from complex to simple to something in-between. A Mobile Operating System is a set of data and programs that runs on a computer or mobile device. It manages all the hardware and optimizes the efficacy of the application software in the device.

Success of a mobile platform entirely depends on its adaptability to the third party applications. In recent years, since the launch of the Smartphone, it has proved itself to be an end-to-end mobile communication solution for the global mobile users. The major smartphone companies are creating a monopoly of securing the information system.

## **Battery**

Research on smartphone battery life has typically focused on improving the energy efficiency of hardware, software and network protocols, or on understanding user strategies for battery management. While the energy efficiency of smartphones is a priority for hardware and software providers, the increasing screen sizes and sensor capabilities have practically stagnated the perceived battery life available for end users. Research claims that users value the battery life of their smartphones, but no study to date has attempted to quantify battery value and how this value changes according to users' current context and needs. Application State Proxy (ASP) suppresses/stops the applications on smartphones and maintains their presence on any other network

device. The applications are resumed/restarted on smartphones only in case of any event, such as a new message arrival.

## **Cameras**

Modern mobile phones or smartphones have multipurpose functions apart from voice and text communications. They are embedded with many useful sensors, including camera, barometer, accelerometer, and digital compass. Unlike other types of sensor, the smartphone camera has been underutilized. This paper aims to fill the gap by analysing and reviewing the hardware and software components of smartphones. It highlights the potential uses of the smartphone cameras to support human daily life activities. The results of the analysis suggested that the rapid development in the smartphone hardware has extended the use of the smartphones cameras beyond personal and social photography

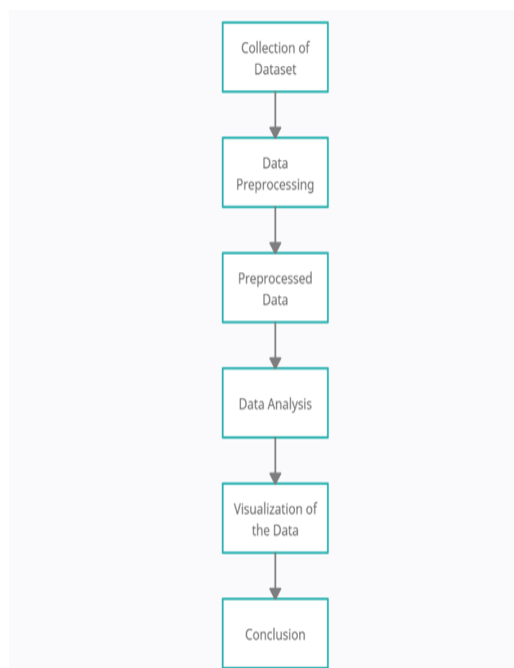
## **Problem Statement**

Since various manufacturers release several smartphones each year, choosing which phone to purchase has become increasingly difficult for an average user. Every day, the mobile line-up becomes more and more confusing, making it impossible to keep track of every smartphone in a given price range. An average consumer is often not sure which definitions are best. Even for someone who enjoys using a smartphone, it can sometimes be difficult to keep track of data and specifications.

## **Proposed Method**

Using the technique of " Web Scraping," we use Python's scrapy library to scrape the necessary data from websites into a database, including the phone name, geek bench score, and other details. This database will contain all of the details needed to create the dataset. The created dataset is then used for visualization, in which data from various smartphones is compared to one another. Python is used to create the visualization. We use SQL libraries to bind the

database to Python and extract data from it. The user can specify a price range, and the smartphones will be sorted based on that range. At the specified price range, the user may also specify camera, battery, monitor, sound, output, software, and sound preferences. The front end is built using HTML. Flask is a Python-to-HTML framework, which is used to build the back end. The data from the smartphone is visualized using a radar chart, a bar chart, and a line chart, using plotly.



## Methodology Implementation

Plotly is used for visualization, plotly makes it easy to create, deploy, and share interactive web apps, graphs, and visualizations in any programming language. Data preprocessing is the first step marking the initiation of the process.

Pre-processing refers to the transformations applied to our data before feeding it to the algorithm. Data Preprocessing is a technique that is used to convert the raw data into a clean data set. In other words, whenever the data is gathered from different sources it is collected in raw format which is not feasible for the analysis. The preprocessed data is used for Data Analysis. Data analysis is defined as a process of cleaning, transforming, and modeling data to discover useful information for business decision-making.

The purpose of Data Analysis is to extract useful information from data and take the decision based upon the data analysis.

We perform visualizations using radar charts, bar charts and line charts.

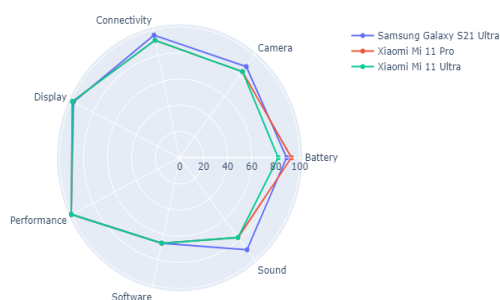
A Radar Chart displays multivariate data in the form of a two-dimensional chart of quantitative variables represented

on axes originating from the center. The relative position and angle of the axes is typically uninformative. It is equivalent to a parallel coordinate plot with the axes arranged radially. For a Radar Chart, use a polar chart with categorical angular variables, with `px.line_polar`, or with `go.Scatterpolar`.

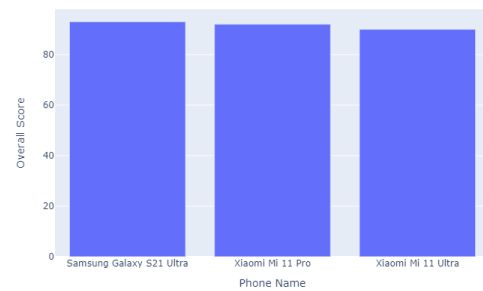
A bar chart or bar graph is a chart or graph that presents categorical data with rectangular bars with heights or lengths proportional to the values that they represent. The bars can be plotted vertically or horizontally. With `px.bar`, each row of the DataFrame is represented as a rectangular mark.

A line chart is a graphical representation of an asset's historical price action that connects a series of data points with a continuous line.

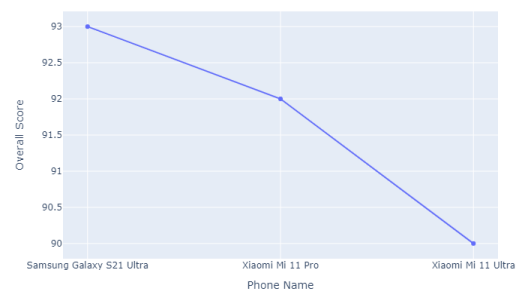
Smartphone Comparison



Overall Score Comparison (Bar Chart)



Overall Score Comparison (Line Chart)



## Conclusion

The research attempted to address the perception of users regarding various attributes of smartphones which influence their smartphone purchase decision. The study put forward the following key findings. Respondents ranked 'basic functions' of smartphones as their most looked into feature while selecting a phone and 'advance features' of smartphone is ranked the last. This finding highlighted that the users consider the basic functions of a phone in spite of add-on features while making the purchase decision of their smartphone. In the category 'basic function', battery life of a

smartphone is the most preferred attribute. Brand of a smartphone is the most looked-into attribute in the category 'Appearance and Identity'. In 'Operation' related attributes, RAM capacity is the most preferred attribute. Handset's inbuilt internet capacity and sensitivity to eye movement are the most looked-into attributes in the category 'Connectivity' and 'Advanced Feature'.

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