

THE CELLULAR ANOMALY

A

Project Report

Submitted in partial fulfillment of the requirements of the 2nd semester guidelines of the subject Working With Data

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CANDIDATES DECLARATION

We hereby certify that the project work entitled **The Cellular Anomaly** using **Excel** in partial fulfillment of the requirements for the completion of the **Second Semester** in **Computer Science And Engineering** and submission to the course moderator, **Mr. Hitesh Kumar Sharma of University of Petroleum And Energy Studies, Dehradun**, is an authentic record of our work carried out during a period from **April, 2020 to May, 2020** under the supervision of **Dr. Hitesh Kumar Sharma, Assistant Professor(SG), Department of Cybernetics**.

The matter presented in this project has not been submitted by us for the award of any other degree of this or any other University.

Name of Students	Ananya Aditi Singh	Vedant Saraf	Ananya Asthana	Amitesh Singh	Anmol Singhal
Roll No.	R214220146	R2142201288	R214220148	R214220141	R214220177

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

(Date: 13th April, 2020)

(Dr. Hitesh Kumar Sharma)
Project Guide

ACKNOWLEDGEMENT

We wish to express our deep gratitude to our guide Dr. Hitesh Kumar Sharma, for the constant support he has given us throughout our project work. This work would not have been possible without his support and valuable suggestions. Our learning environment became much efficient after indulging with the studying process of our mentor.

We would like to thank all our friends for their help and constructive criticism during our project work. Finally, we have no words to express our sincere gratitude to our parents who have shown us this world and for every support they have given us.

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ABSTRACT

This project uses a comprehensive and intricate data set of numerous brands of cell phones consisting of data values along the lines of the many attributes which comprises of Model framework, OS structure, CPU capacity, RAM scope, Battery range, Display resolution and Pricing. This project provides the reader with a detailed analysis of procuring the ideal cell phone of an ideal smartphone company. It has incorporated the data analysis both visually and graphically to present an intelligible outcome of the scenario in countless smartphone companies.

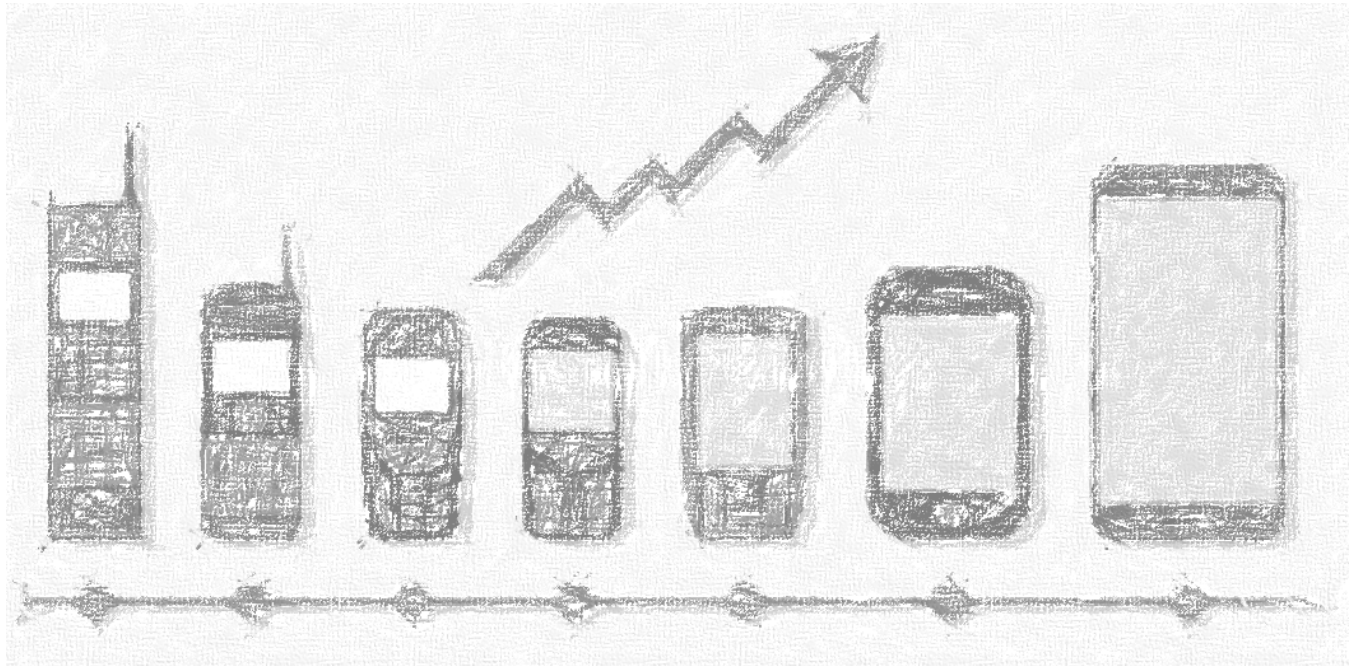
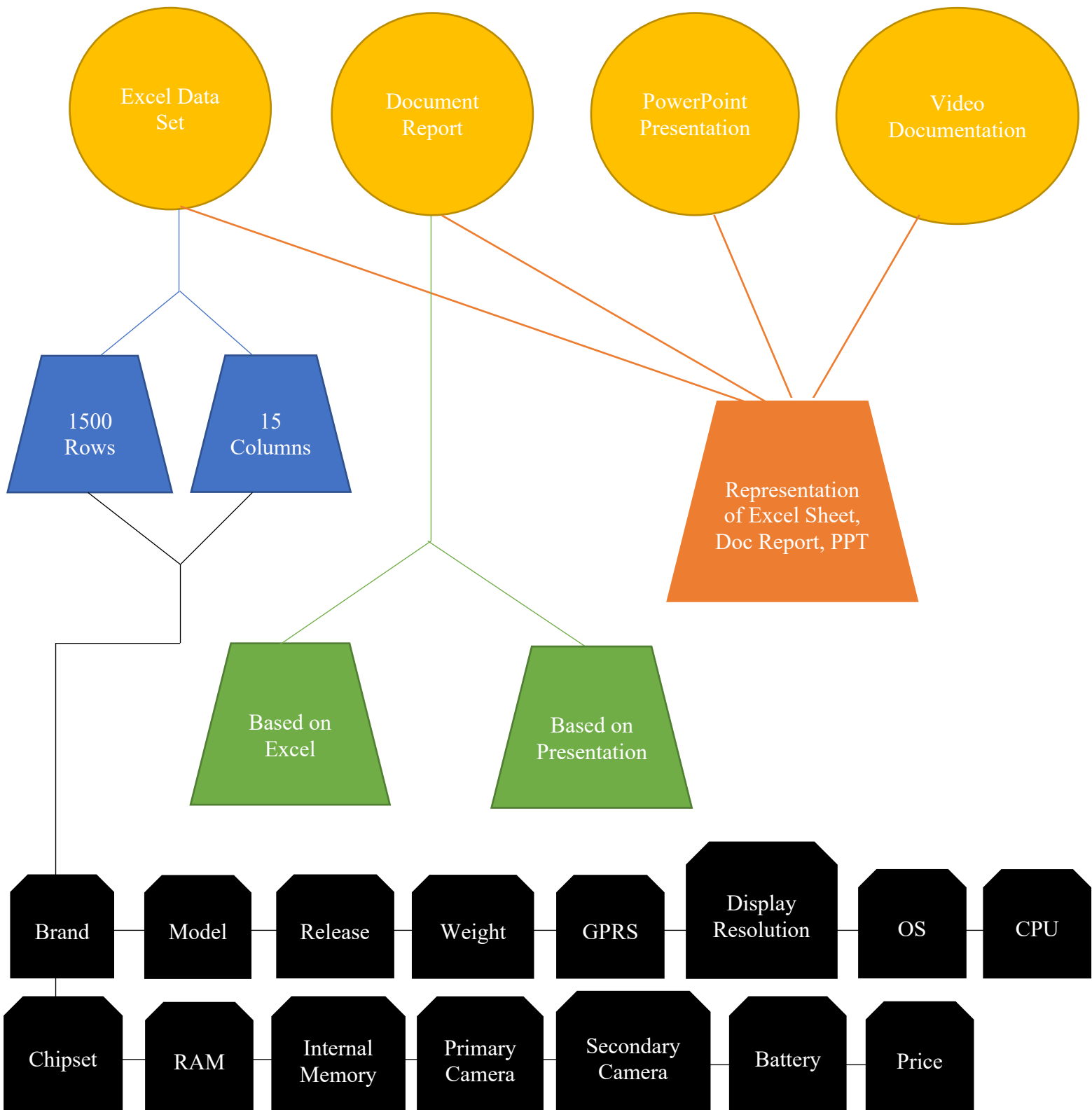


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ROAD MAP STUDY



INTRODUCTION

My team and I were brainstorming ideas one day and it came to mind that after we've interviewed the society we could notice that there was a debate for what would be the ideal smartphone in the market. We decided to formulate an algorithm that would be able to discover the ideal smartphone of the many companies available in the market today. We decided to tabulate the raw data gathered in an excel sheet.

Excel is a handy software that can be used to store and organize many data sets. Using its features and formulas, you can also use the tool to make sense of your data. For example, you could use a spreadsheet to track data and automatically see sums averages and totals. There are wonderful tools for sorting, filtering and searching which all the more make you work easy.

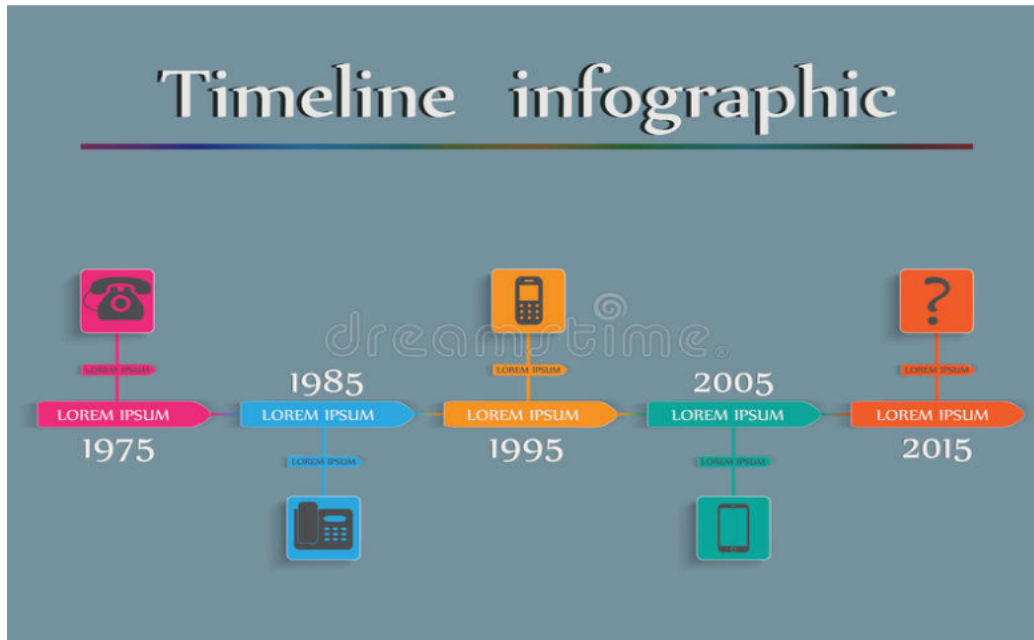
The second formattable approach was a Document Report. This would give us an overview of the entire work structure for the project. Reports communicate information which has been compiled as a result of research and analysis of data and of issues. It can cover a wide range of topics, but usually focus on transmitting information with a clear purpose, to a specific audience.

Now, the PowerPoint Presentation sums up the entire project in a more creative and noticeable way. It is a great approach to evaluate the visual representation of the formatted data set and documentation report of said data set.

Overall, we've worked the way up for using excel and it's formatting tools to help set up a formatted data sheet and used both a document and a presentation to view said data in a convenient and professional format.

BACKGROUND STUDY

The smartphone technology has been evolving faster than ever.



What were once large and bulky luxury items have become small, compact devices we can't live without. In fact, 60% of Indians own a smartphone and 75% of Indians own a cell phone of some kind.

The attributes which affected the selection of the device were mainly internal memory, RAM, brand, model, battery, display resolution and most importantly, the price.

Rapidly expanding software titles, better screen resolution, and constantly improved interface make cell phones easier to navigate, and more fun to use. Add to that an expanding capacity that can hold as much memory as a computer would just a few years ago, and you can see why it's an exploding market.

The cell phone has changed and developed so rapidly in the past decade that it seems as though almost anything you can imagine is possible for the future. The convergence of all our tech gadgets into one mobile device will continue to advance.

OBJECTIVE

“To analyze and formulate data consisting of vital factors according to the technology and growth of the smartphone industry”

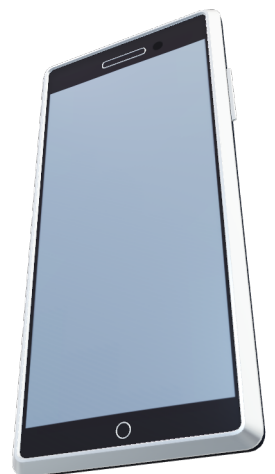
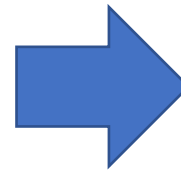
Background Study

Initialize Parameters

Comparison
Analysis

Factor Processing

Result Check



METHODOLOGY

The most appropriate tool to encounter during the collection of data is Excel. Excel includes many common functions that can be used to quickly find the sum, average, count, maximum value, and minimum value for a range of cells. In order to use functions correctly, we understand the different parts of a function and how to create arguments to calculate values and cell references.

The most common functions that we've included in the format of "The Cellular Anomaly" data set were the following:

◊ **Find & Replace Function:**

- Select the range of cells where you want to replace the text or numbers.
- Go to Home menu > editing ground > select Find & Select > Click Replace or press CTRL+H from the keyboard.
- On Find what box type, the text or value that is to be searched for.
- **Syntax:** =FIND (find_text, within_text, [start_num])
=REPLACE (old_text, start_num, num_chars, new_text)

◊ **Left Function:**

- The Excel Left Function extracts a given number of characters from the left side of a supplied text string.
- The purpose of the function is to extract text from the left side of the string and can return value as one or more characters.
- **Syntax:** =LEFT (text, [num_chars])

◇ **Search Function:**

- The Excel search function returns the location of one text string inside another. Search returns the position of the first character of find_text inside within_text. It isn't case-sensitive.
- The purpose of this is to get the location of the text in a string and the return value of the said text is a number representing the location of find_text.
- **Syntax:** =SEARCH (find_text, within_text, [start_num])

◇ **Find Function:**

- The Excel find function returns the position (as a number) of one text string inside another. When the text is not found, the find function returns a #VALUE error.
- The purpose of this is to get the location of the text in a string and the return value of the said text is a number representing the location of find_text.
- **Syntax:** =FIND (find_text, within_text, [start_num])

◇ **Paste Selection Tool:**

- Select the entire range that is to be copied.
- Press Alt+; to select the visible cells only. The selection is cut up to skip the hidden rows and columns.
- Copy the range – Press Ctrl+C or Right-click>Copy
- Select the cell or range that you want to paste to
- Paste the range – Press Ctrl+V or Right-click>Paste

◇ **If Function:**

- The IF function runs a logical test and returns one value for a TRUE result, and another for a FALSE result. More than one condition can be tested by nesting IF functions. The IF function can be combined with logical functions like AND/OR to extend the logical test.
- The purpose of the said function is to test for a specific condition and return value is to result in either TRUE or FALSE.
- **Syntax:** =IF (logical_test, [value_if_true], [value_if_false])

◇ **Nested If Function:**

- Nested IF functions, meaning one IF function inside of another, allows to test multiple criteria and increases the number of possible outcomes.
- Click the cell in which the formula is to be entered.
To start the formula with the function, click Insert Function on the formula bar. Excel inserts the equal sign.
- Search for a function box.
- To enter another function as an argument, enter the function in the argument box.
- **Syntax:** =IF (logical_test for Category 1, Category 1, IF (logical_test for Category 2 , Category 2 , Category 3))
- **Making nested IFs easier to read:** By their nature, nested IF formulas can be hard to read. Adding a line breaks inside the formula to "line up" the tests and results.
- **NOTES:**
 - The newer IF Functions can handle multiple conditions in a single function.
 - VLOOKUP can be preferable to handle complicated IF statements.

◇ **Count If Function:**

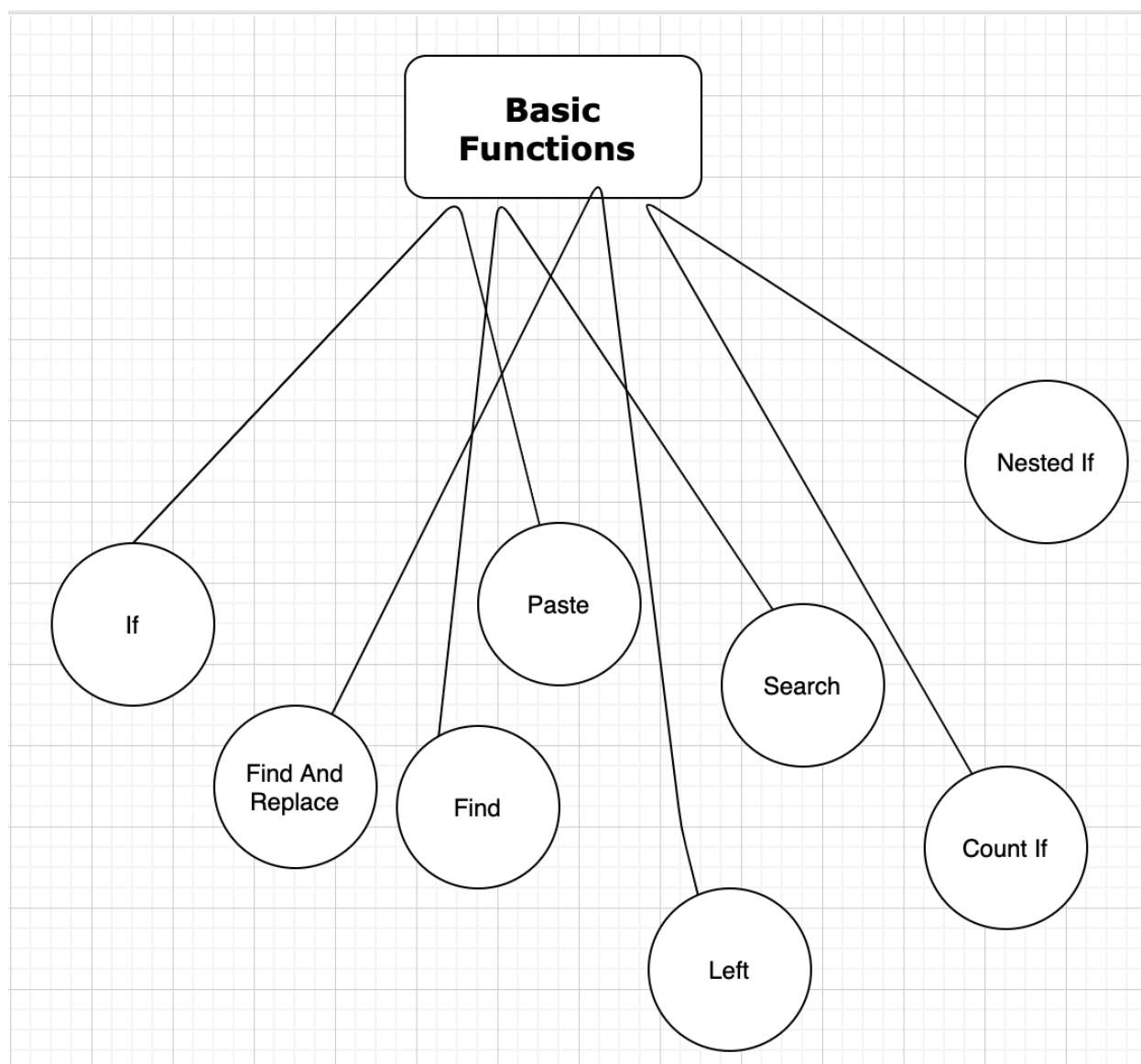
- The COUNTIFS function takes multiple criteria in pairs — each pair contains one range and the associated criteria for that range. To generate a count, all conditions must match. To add more conditions, just add another range/criteria pair.

- **Syntax:** =COUNTIFS(range1, criteria1, range2, criteria2)

- **Alternative:** SUMPRODUCT is more powerful and flexible than COUNTIFS, and it works with all Excel versions, but it is not as fast with larger sets of data.

- **Alternative Syntax:** =SUMPRODUCT((cell_range="format_input")*(cell_range>15))

Flowchart



EXECUTION

The process for which every data selection has been accounted for is executed as follows:

- 1) The raw data set was gathered by collecting average data records from a defined timeline, so as to incorporate every miniscule change in the graphing patterns.
- 2) The raw data set was already available in the Excel sheet. It was calculated for and later converted in a shorter, cleaner and visually acceptable raw data format.
- 3) The data records were formatted in a defined manner. Every function mentioned in the Methodology Section has been tried and applied for in the formatted and different version of the Excel data set.
- 4) The data was interpreted graphically in the form of pie charts, 3D charts, histograms, bar graphs, box and whisker charts, funnel charts and doughnut charts.
- 5) In order to make the completion more visually grasping and differentiable between different categories, visual attributes such as images and 3D models were involved.
- 6) To finalize the report, a documentation format was considered acceptable as it made the collection of every set of data much simpler and indexed.
- 7) The Presentation was made in order to finish the report in an abstract yet a defined context of the theme, “The Cellular Anomaly”. It provided the source for the visual representation of the project which was the video documentation.
- 8) Enlisting the Excel data set, the graphing patterns, visual examples as well as the video documentation, led to the completion of the final project.

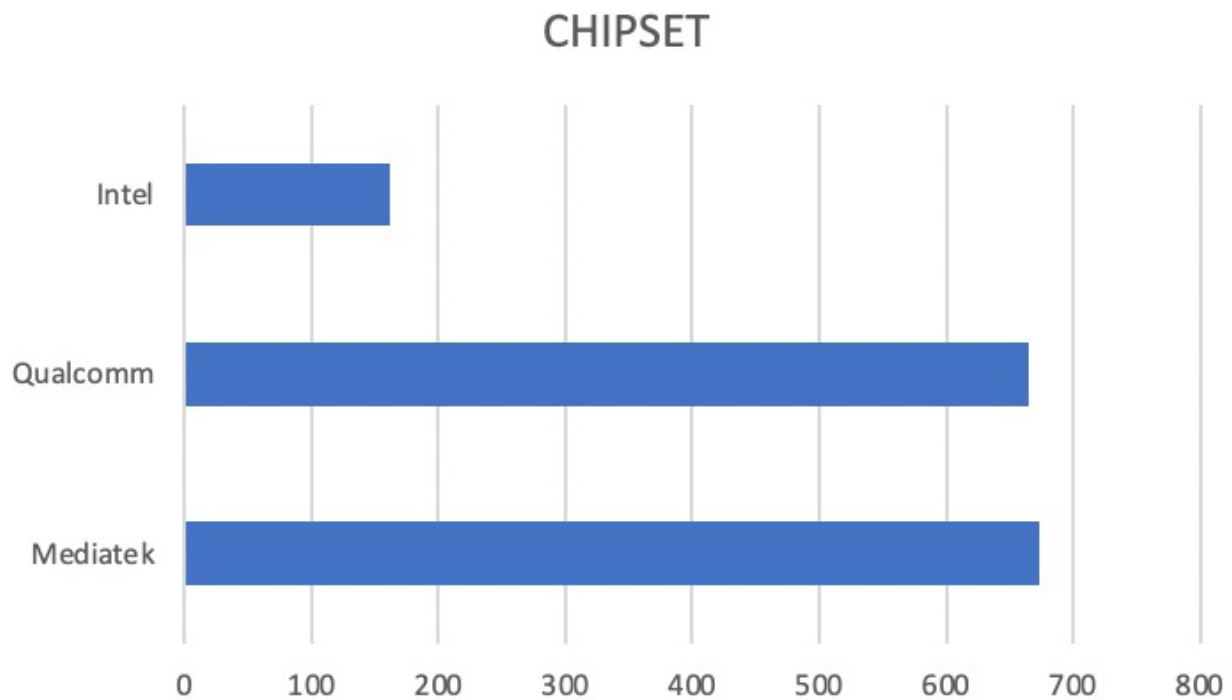
GRAPHICAL REPRESENTATION

BAR GRAPHS

1) CHIPSET:

Factors Included: Intel, Qualcomm, Mediatek

Conclusion: Mediatek>Qualcomm>Intel

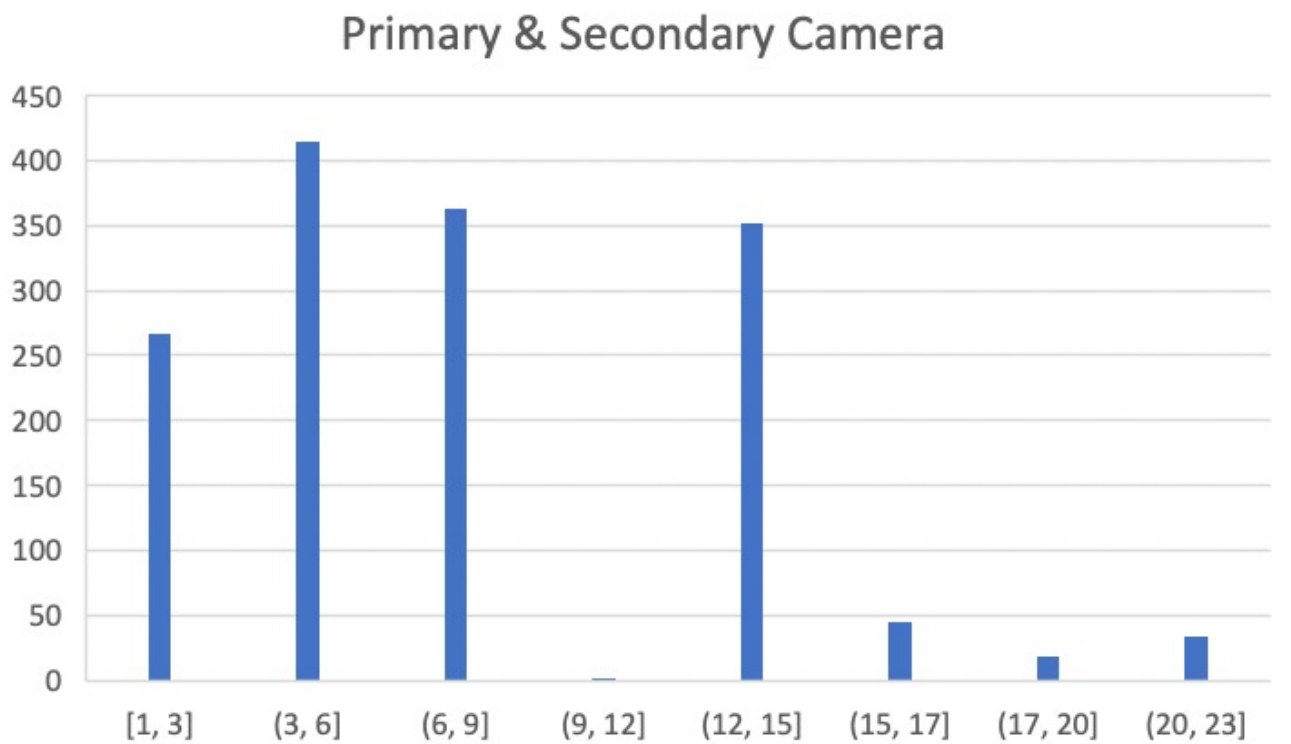


2) Primary & Secondary Camera:

Factors Included: MegaPixel Range-(1:23)

Conclusion: Primary Camera Preference: (3:6) MegaPixel

Secondary Camera Preference: (12:15) MegaPixel



3) Price:

Currency Included: INR

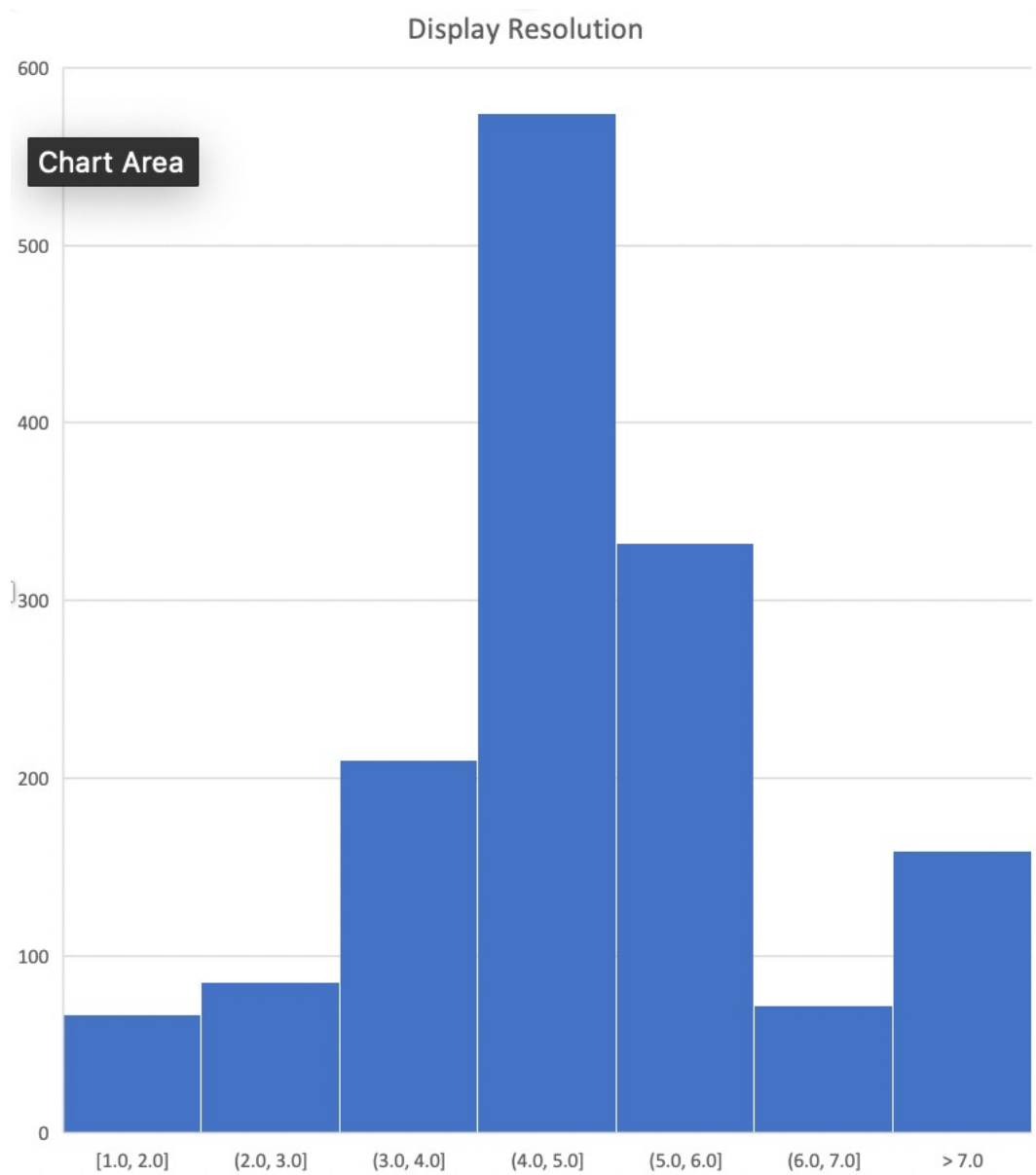
Conclusion: Average Budget Range: (1000:25000)



4) Display Resolution:

Unit Included: Inches

Conclusion: Average Resolution: (4.0, 5.0)

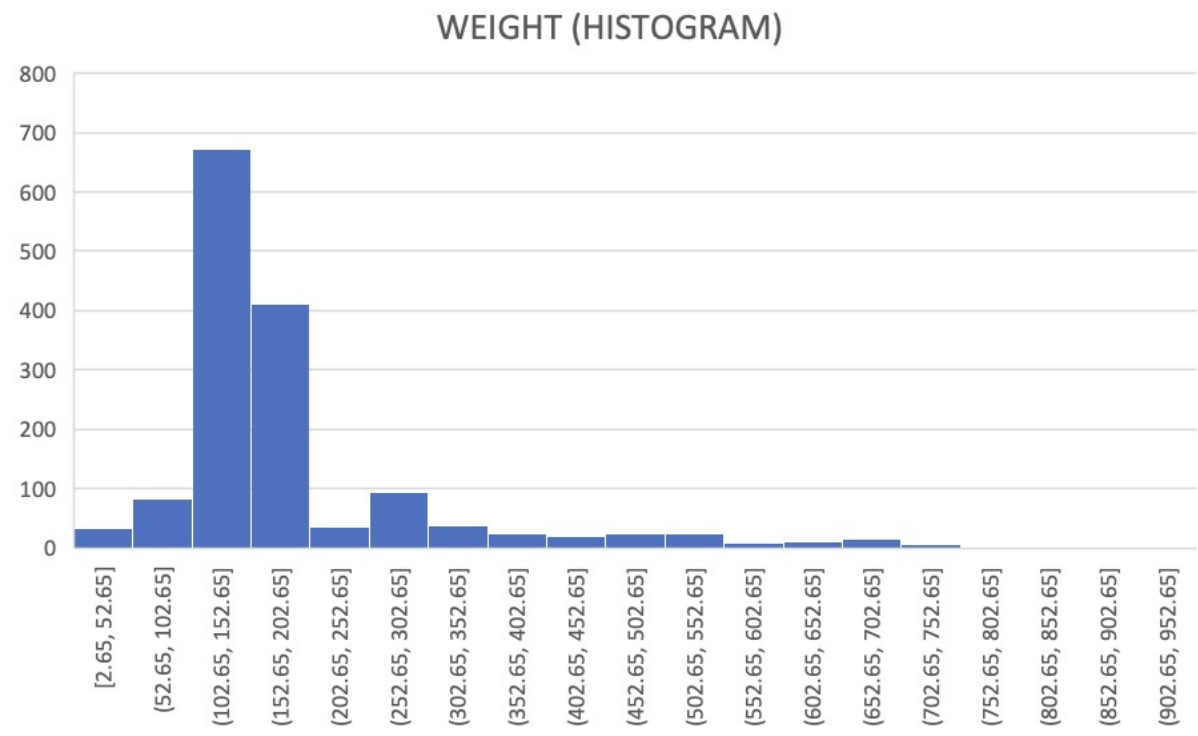


HISTOGRAMS

1) Weight:

Unit Included: Grams (g)

Conclusion: Preferred Range: (100:150) g

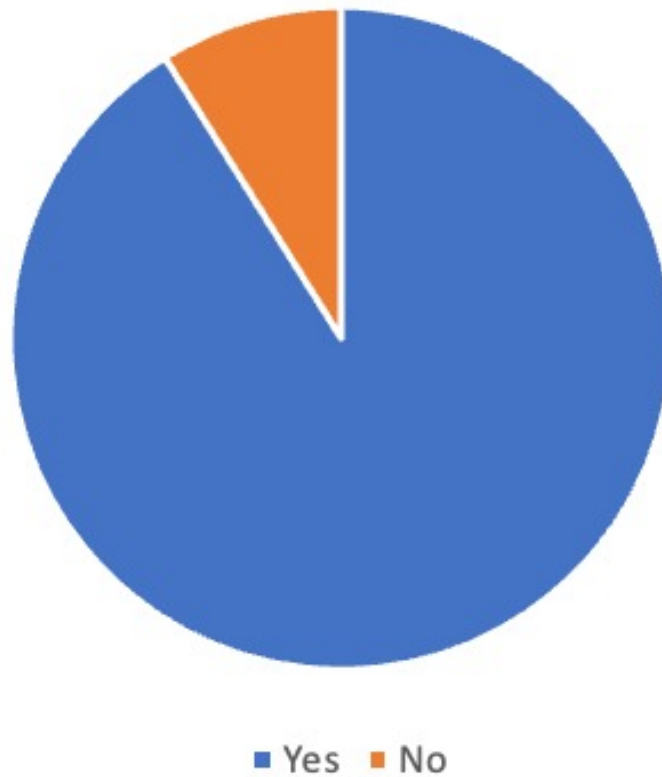


PIE-CHARTS

1) GPRS:

Conclusion: Preferred Factor (Yes>No)

GPRS (2-D PIE)

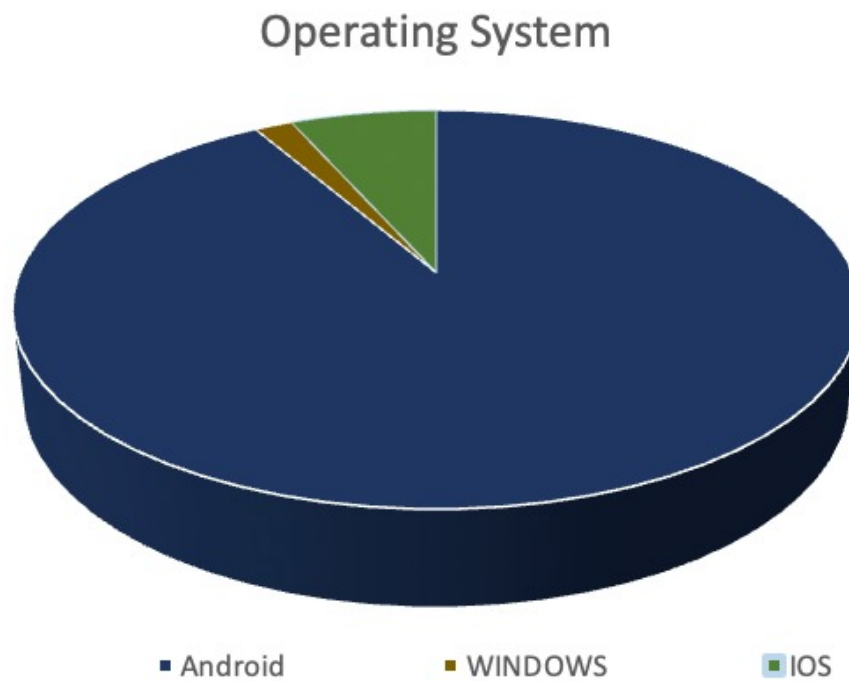


3D PIE-CHARTS

1) Operating Systems:

Factors Included: Android, Windows, IOS

Conclusion: Android>IOS>Windows

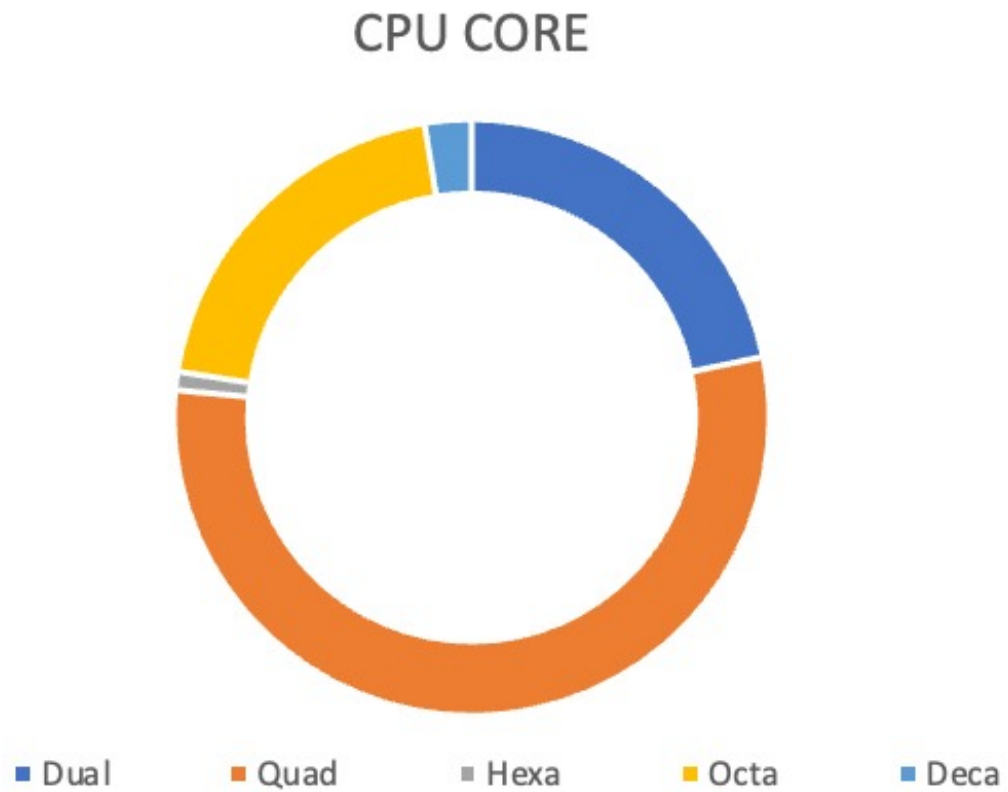


DOUGHNUT CHART

1) CPU Core:

Factors Included: Dual, Quad, Hexa, Octa, Deca

Conclusion: Quad>Dual>Octa>Deca>Hexa



INFERENCES

Society-Favored Conclusion:

- 1) Weight: 100-150 g
- 2) GPRS: Favored
- 3) Display Resolution: 4-5 inches
- 4) Operating Systems: Android
- 5) CPU Core: Quad
- 6) CHIPSET: Mediatek
- 7) Primary & Secondary Camera: 3-6 MP/12-15 MP
- 8) Price: >25000 INR

REFERENCES

- 1) Data Set Link: <https://www.kaggle.com/arwinneil/gsmarena-phone-dataset>
- 2) Excel Course Link(COURSERA):
<https://www.coursera.org/learn/excel-data-analysis/home/welcome>
- 3) Function Reference: <https://exceljet.net/excel-functions/excel-countif-function>
- 4) Excel-Graph Manipulation:
<https://www.youtube.com/watch?v=CnwuhrKdWgE>
- 5) Blackboard Notes Link:
https://learn.upes.ac.in/webapps/blackboard/execute/modulepage/view?course_id=_49716_1&cmp_tab_id=_133405_1&mode=view

We would like to express our gratitude to our course moderator and our project guide, Mr. Hitesh Kumar Sharma, for his continued efforts and dedication towards teaching all of us the informative techniques and applications in Excel .