**YouTube Channel Analysis**

**Objective**

The primary goal of this project is to analyze and visualize key metrics (total views, comments, likes, date, and time) from five selected YouTube channels:

1. VJ Siddhu Vlogs
2. Net Ninja
3. Ashish Chanchlani Vines
4. 7clouds
5. freeCodeCamp

The analysis involves fetching data using the YouTube API, cleaning the data, and creating insightful visualizations using tools like Python and Power BI.

**Technologies and Tools Used**

1. **Google Console Developer**
   * To generate and manage the YouTube API key.
2. **Anaconda Navigator**
   * Python environment setup.
3. **Jupyter Notebook**
   * For coding and analyzing data.
4. **YouTube Data API**
   * For fetching channel details like views, comments, likes, and timestamps.
5. **Python Libraries**
   * **Seaborn, Plotly, Matplotlib**: Used for data visualization.
6. **Microsoft Excel**
   * For data cleaning and arrangement.
7. **Power BI**
   * For creating an interactive dashboard with bar charts, pie charts, and scalar visuals.

**System Architecture**

1. **Data Collection**
   * YouTube API is accessed using the API key generated in Google Console Developer.
   * Data points like views, likes, comments, and timestamps are fetched.
2. **Data Cleaning**
   * Raw data is saved in a CSV format.
   * Data is cleaned and arranged systematically in Microsoft Excel.
3. **Data Visualization**
   * Python libraries (Seaborn, Plotly, Matplotlib) are used for initial visualizations.
   * Final insights and dashboards are created using Power BI.

**Implementation Steps**

1. **API Key Generation**
   * Accessed Google Console Developer to create a project and generate a YouTube API key.
2. **Data Retrieval**
   * Used Python and Jupyter Notebook to import the API key and retrieve details for the selected channels.
   * Fetched data includes total views, likes, comments, and video timestamps.
3. **Data Cleaning**
   * Exported the data to a CSV file.
   * Cleaned and formatted the data using Microsoft Excel.
4. **Visualization**
   * Plotted initial graphs using Python visualization libraries.
   * Created an interactive Power BI dashboard with bar charts, pie charts, and scalar visuals.

**Features of the Dashboard**

1. **Bar Chart**
   * To compare views, likes, and comments across the five channels.
2. **Pie Chart**
   * To represent the percentage contribution of likes or comments for each channel.
3. **Scalar Visualization**
   * To highlight total views or average engagement per channel.

**Challenges Faced**

1. Understanding and implementing the YouTube API for data retrieval.
2. Cleaning and organizing the raw data for accurate visualizations.
3. Configuring Power BI to present the data interactively.

**Future Enhancements**

1. Include more YouTube channels for analysis.
2. Add advanced metrics like engagement rate or subscriber growth trends.
3. Automate the entire process from data fetching to dashboard creation.

**Conclusion**

This project successfully analyzed and visualized data from five YouTube channels, providing valuable insights into their performance. The use of tools like Python, Excel, and Power BI ensured that the project was both robust and visually appealing.