**YouTube Video Trend Analysis using Web Scraping and Pandas**

**Abstract**

The **YouTube Video Trend Analysis** project is a **data analytics application** that utilizes **web scraping and data processing** to analyze trending YouTube videos. The project extracts real-time video data from YouTube’s trending section using **web scraping techniques** and processes it using **Pandas and data visualization libraries**. The goal is to identify patterns in trending videos, such as **popular content categories, video duration impact, keyword trends, and engagement metrics** (likes, comments, views).

This project is built using **Python, BeautifulSoup, Selenium, Pandas, and Matplotlib/Seaborn** for data collection, processing, and visualization. It provides valuable insights for **content creators, digital marketers, and data analysts** who aim to understand what makes a video trend on YouTube.

**Key Features**

1. **Web Scraping of YouTube Trending Videos** – Uses **BeautifulSoup & Selenium** to extract trending videos based on category, title, views, likes, and comments.
2. **Data Cleaning & Processing** – Uses **Pandas** to clean and preprocess scraped data for analysis.
3. **Sentiment Analysis** – Performs basic **Natural Language Processing (NLP)** to analyze video titles and descriptions for sentiment trends.
4. **Category & Keyword Analysis** – Identifies **popular video topics, keywords, and trends** using word clouds and frequency distribution.
5. **Engagement Insights** – Analyzes the relationship between **views, likes, comments, and shares** to determine engagement levels.
6. **Time-Based Trends** – Compares daily and weekly trending videos to identify long-term vs. short-term trends.
7. **Visualization Dashboard** – Uses **Matplotlib, Seaborn, and Plotly** to create interactive trend reports.
8. **Automated Data Collection** – Runs scheduled scripts to fetch and update YouTube trend data periodically.

**Technology Stack**

* **Web Scraping:** BeautifulSoup, Selenium
* **Data Processing & Analysis:** Pandas, NumPy
* **Visualization:** Matplotlib, Seaborn, Plotly

**Use Cases**

* **Content Creators:** Helps YouTubers understand trending topics and optimize their video content.
* **Digital Marketers:** Provides insights into viral content strategies for advertising.
* **Media Analysts:** Identifies trends in video categories and audience engagement.
* **Researchers:** Analyzes social media trends and user behavior through YouTube data.