# Analytico

## Overview:

Build a RESTful API using Python with Flask that allows users to perform various data analytics tasks interactively. The API will integrate with Jupyter notebooks to execute data analysis scripts and produce interactive dashboards using popular libraries like Pandas, Plotly, and Bokeh.

## Key Features:

### 1. User Authentication and Authorization:

* Implement user authentication (e.g., JWT tokens) to secure access to the API endpoints.

### 2. Data Input and Processing:

* Allow users to upload datasets in various formats (CSV, Excel, etc.) through API endpoints.
* Use Pandas to process and clean the uploaded data, performing basic data wrangling tasks.

### 3. Interactive Data Analysis:

* Integrate Jupyter notebooks within the API to execute data analysis scripts dynamically.
* Users can submit Python scripts or queries through API endpoints, and the API will execute these in a sandboxed environment.

### 4. Visualization and Dash boarding:

* Use Plotly or Bokeh to generate interactive visualizations based on the data analysis results.
* Create endpoints that return rendered dashboards or charts in response to user queries.

### 5. API Endpoints

* Data Upload Endpoint: Accepts file uploads and stores data for processing.
* Analysis Execution Endpoint: Receives scripts or queries, executes them in a secure environment, and returns results.
* Visualization Endpoint: Renders interactive dashboards or charts based on user requests.

### 6. Documentation and Testing:

* Provide comprehensive documentation for API endpoints using tools like Swagger.
* Implement unit tests and integration tests to ensure API functionality and reliability.

### Additional Ideas to Enhance the Project:

* - Caching and Performance Optimization: Implement caching mechanisms to improve API response times for frequently requested analyses.
* - Containerization and Deployment: Use Docker to containerize the API and deploy it on platforms like AWS or Heroku for easy accessibility.
* - Collaborative Notebooks: Extend the API to support collaborative Jupyter notebooks, allowing multiple users to work on the same analysis simultaneously.

### Learning Outcomes:

This project will enable you to strengthen your skills in:

- Python (Flask framework)

- Data handling and analytics with Pandas

- Interactive visualization using Plotly or Bokeh

- Integrating Jupyter notebooks into web applications

- API development, testing, and documentation