# Cryptocurrency Data Fetching and Analysis Report

- **Objective**

  The goal of this project was to fetch live cryptocurrency data for the top 50 cryptocurrencies, perform basic analysis, and present the data in a live-updating Excel sheet. Additionally, Artificial Intelligence (AI) tools were integrated to assist with project design and execution, ensuring efficient implementation and optimal results.

## Steps to Complete the Project

1. Fetch Live Cryptocurrency Data

- **API Used**: CoinGecko API.
- **Data Fetched**:
  - Cryptocurrency Name
  - Symbol
  - Current Price (USD)
  - Market Capitalization
  - 24-hour Trading Volume
  - 24-hour Price Change (percentage).

## Implementation:

Python's requests library was used to query the API. The data was structured into a pandas DataFrame for further analysis.

2. Perform Data Analysis

   Key insights derived include:

- **Top 5 Cryptocurrencies by Market Capitalization**: Identified the leading cryptocurrencies based on their market value.
- **Average Price of the Top 50 Cryptocurrencies**: Calculated the mean price to observe general pricing trends.
- **Highest and Lowest 24-hour Price Changes**: Analyzed the most volatile assets to highlight opportunities and risks.

3. Present Data in a Live-Running Excel Sheet
   - **Setup**:
   The project creates a live-updating Excel file (`crypto_live_data.xlsx`) using the `openpyxl` library.
   - **Live Updates**:
   The script fetches fresh data every 5 minutes and appends it to the Excel sheet, enabling continuous monitoring.
   - **Usage**:
   Users can open the Excel file to view real-time updates and track cryptocurrency trends.

# Integration of AI in the project

To enhance the development process, AI tools were utilized in the following ways:

1. **Project Design**:
   - AI provided guidance on structuring the project, including API selection, library usage, and live data integration.
2. **Code Optimization**:
   - AI assisted in debugging and improving the efficiency of Python scripts, ensuring smooth API data fetching and Excel updates.

3. **Report Generation**:
   - ○ AI generated insights and summarized the process, saving time and ensuring a professional report.

# Technical Overview

**Technologies and Libraries Used:**

1. **Python Libraries**:
   - ○ `requests`: To fetch data from the CoinGecko API.
   - ○ `pandas`: For data manipulation and analysis.
   - ○ `openpyxl`: To write data to Excel.
2. **API**:
   - ○ **CoinGecko**: Provides free and reliable cryptocurrency market data.
3. **AI Assistance**:
   - ○ Used for project guidance, code improvement, and report creation.

**Execution Flow:**

1. Fetch cryptocurrency data every 5 minutes from the CoinGecko API.
2. Process the data into a pandas DataFrame for analysis.
3. Perform analysis to identify key trends and insights.
4. Write the processed and analyzed data to an Excel file.
5. Repeat the process continuously to keep the data updated.

# Key Insights

- **Market Leaders**: The top 5 cryptocurrencies (e.g., Bitcoin, Ethereum) dominate the market capitalization rankings.

- **Price Trends**: The average price across the top 50 cryptocurrencies provides a benchmark for comparison.

- **Volatility**: The cryptocurrencies with the highest and lowest price changes highlight market fluctuations.

## Conclusion

This project successfully integrates live cryptocurrency data fetching, analysis, and presentation in a real-time updating Excel sheet. AI tools were pivotal in streamlining the development process, from code optimization to report generation, ensuring a professional and efficient workflow. The project provides a reliable solution for monitoring cryptocurrency trends and performing quick analyses.