**Assignment: Satellite Imagery Analysis for Agricultural Monitoring**

**Objective:**

Develop a Python-based tool to analyze time-series satellite imagery for monitoring the health and progress of individual agricultural fields.

**Data Source:**

Utilize freely available satellite imagery datasets (e.g., from Sentinel-2 or Landsat 8).

**Tasks:**

1. Data Retrieval:
   1. Write a Python script to automatically download satellite images for a specific region over a defined time period (e.g., the last 6 months).
   2. Ensure the script can filter images based on cloud cover percentage.
2. Pre-Processing:
   1. Implement image pre-processing steps including:
   2. Atmospheric correction.
   3. Geometric correction.
   4. Cloud masking.
3. Vegetation Index Calculation:
   1. Calculate commonly used vegetation indices like NDVI (Normalized Difference Vegetation Index) and EVI (Enhanced Vegetation Index).
   2. Analyze the variation of these indices over the selected time period.
4. Data Visualization:
   1. Create visualizations (graphs, maps) to represent the time-series analysis of the vegetation indices.
   2. Include a feature to compare different fields or time periods.
5. Report Generation (Optional):
   1. Automatically generate a summary report including key statistics and visualizations.
6. Bonus (Optional):
   1. Incorporate a machine learning model to predict future trends based on past satellite data.

**Deliverables:**

* Source code in Python, with comments for clarity.
* A README file explaining how to set up and run the script.
* A sample output report generated by the script.

**Evaluation Criteria:**

* Code quality and readability.
* Accuracy of the implemented algorithms.
* Efficiency of data processing.
* Quality and clarity of the generated outputs and reports.