Instructions:

1. **Language**: All deliverables, including code comments, documentation, and diagrams, must be in English.
2. **Submission**: Provide a link to a Git repository containing:
    - Source code (Python and SQL) with clear execution instructions.
    - Documentation files and architectural diagrams.
3. **Cloud Access**: In order to be able to do the test, you need to create a free Google Cloud Account.

Tasks:

1. Data Ingestion: Fetching and Storing Product Data

- **Objective**: Develop a Python script that retrieves product data from the Fake Store API and stores it in a structured format in Google Cloud Storage.
- **Requirements**:
    - **Data Retrieval**:
        - Use Python to send HTTP GET requests to the Fake Store API's products endpoint (https://fakestoreapi.com/products).
        - Parse the JSON response to extract product details.
    - **Data Storage**:
        - Convert the product data into a structured format.
        - Automatise the upload the structured file to a Google Cloud Storage bucket.

2. Data Transformation and Modeling: Creating a Star Schema

- **Objective**: Utilize the bigquery-public-data.google_analytics_sample dataset in BigQuery to design and implement a star schema that enables efficient querying and analysis.
- **Requirements**:
    - **Data Model Design:**
        - Analyze the dataset to determine the most appropriate data model schema that facilitates efficient analytics.
    - **Data Transformation:**

    - Write SQL queries to transform the existing dataset into the designed schema.
    - Create the necessary tables in your BigQuery project.

3. Analytical Tasks: Answering Advanced Business Questions

- **Objective**: Utilize the data model created in Task 2 to answer specific business questions through SQL queries.
- **Advanced Business Questions**:
    1. **Customer Purchase Patterns**: Identify the top 5 customers with the highest total purchase amounts over the past year. Additionally, analyze the monthly purchasing trends of these customers to determine any seasonal patterns or anomalies.
    2. **Product Performance Analysis**: Determine the top 10 products with the highest sales volumes in the last quarter. For these products, calculate the month-over-month growth rates and identify any significant fluctuations in sales performance.
    3. **Traffic Source Effectiveness**: Analyze the effectiveness of different traffic sources in driving conversions. Calculate the conversion rates for each traffic source and assess how these rates have changed over the past six months.
    4. **User Engagement Segmentation**: Segment users based on their engagement levels (e.g., low, medium, high) and analyze the average revenue generated by each segment. Identify any correlations between user engagement and purchasing behavior.
    5. **Churn Rate Analysis**: Calculate the monthly churn rate of users over the past year. Identify any patterns or trends in user retention and propose potential factors influencing these trends.
- **Requirements**:
    - Write SQL queries against the optimized data model to answer each question, incorporating advanced analytical techniques.
    - Present the results in a clear and interpretable format, such as tables or charts.

Good Luck !!!