Problem Statement: Back Up service using docker and Kubernetes

General Guidelines for the project:

- Create a GitHub Repository. Weekly progress according to the
- problem statement assigned must be pushed to the repo and this will be considered while evaluating.
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Description: Creating a backup service that periodically backs up the contents of a folder to Google Drive using Docker and Kubernetes involves several steps.

In this project, you will work with Docker and Kubernetes to create a Backup service.

Pre-Requisites/ Pre-Installation:

Docker (Windows | Ubuntu | MacOS)

Kubernetes (Windows | Ubuntu | MacOS)

Deliverables:

❖**Week-1: Containerized Google Drive client**

Here's a high-level technical breakdown:

1. **Set up Google Drive API**:
    - Obtain credentials for the Google Drive API.
    - Use the google-api-python-client library to interact with Google Drive.

2. **Create a Docker Container**:
    - Write a Dockerfile that includes all necessary dependencies and your backup script.
    - Build the Docker image.
3. **Write the Backup Script**:
    - Develop a script in Python that uses the Google Drive API to upload files.
    - Ensure the script can be triggered at regular intervals.

❖ **Week-2: Kubernetes Deployment & Orchestration**

- **Kubernetes CronJob**:
    i. Define a CronJob resource in Kubernetes to schedule the backup operation.
    ii. The CronJob will run the Docker container at specified intervals.
- **Persistent Volume Claims (PVC)**:
    i. Use PVCs in Kubernetes to ensure the data you want to back up is accessible to the container running the backup script.
- **Monitoring and Logging**:
    i. Implement logging to track the backup process.
    ii. Optionally, set up monitoring to alert you in case of failures.
- **Security Considerations**:
    i. Securely manage API credentials and sensitive data.
    ii. Use Kubernetes secrets to store sensitive information.
- **Testing and Validation**:
    i. Test the backup process thoroughly to ensure data integrity.
    ii. Validate the recovery process from the backups.