

## Exercise: Setup Your Local Environment for DAG Development & Testing

### Prerequisites

- Basic understanding of Apache Airflow.
- An active GCP project with the necessary APIs enabled.
- VSCode and Conda are installed.

### Task 1: Setting Up a Conda Environment

#### Hints (1)

#### 1. Create a new Conda environment and activate it

```
conda create -n airflow_env python=3.11
conda activate airflow_env
```

#### 2. Install Apache Airflow with the Google provider

```
pip install apache-airflow[google]
```

#### 3. Verify the installation by running `airflow` in the terminal. You should see the `airflow` command's help output

### Task 2: Initialize Apache Airflow

#### Hints (2)

#### 1. Initialize the Airflow database and configure `airflow.cfg`

```
airflow db init
```

#### 2. Open the `airflow.cfg` in a text editor. You might need to adjust the `dags_folder` and `base_log_folder` to your project directory. Make sure to use absolute paths

### Task 3: Authenticate with GCP

#### Hints (3)

#### 1. Activate the service account using `gcloud`

```
gcloud auth activate-service-account --key-file=PATH_TO_YOUR_KEY_FILE
```

#### 2. Set the `GOOGLE_APPLICATION_CREDENTIALS` environment variable in your shell profile (`.bashrc`, `.zshrc`, etc.) or in the VSCode terminal

```
export GOOGLE_APPLICATION_CREDENTIALS="PATH_TO_YOUR_KEY_FILE"
```

#### 3. Verify the authentication by running a `gcloud` command, e.g., `gcloud projects list`

## Task 4: Test Your DAG Locally

### Hints (4)

1. Place your DAG Python file in the `dags` folder specified in your `airflow.cfg`
2. Test individual tasks within your DAG using the `airflow tasks test` command  
`airflow tasks test [DAG_ID] [TASK_ID] [EXECUTION_DATE]`
3. You should see the task executing and logging output in your terminal

### Note

- Ensure your Python file with the DAG is error-free and uses correct references and IDs.
- Keep in mind to use the exact path to your key file and keep the file secure.
- Always deactivate your conda environment after usage by running `conda deactivate`.

**Happy Coding & Testing!**