

# Hands-on Lab: Monitoring a DAG



Estimated time needed: **20** minutes

## Introduction

In this lab, you will work with the Airflow Web UI and CLI to explore the DAGs further. You will be exposed to using the interactive tools to search for DAGs, introduces to various views of the DAGs and how you can use this to explore the DAG workflow, the individual tasks in the workflow and view the outcome of the tasks.

## Objectives

After completing this lab you will be able to:

- Search for a DAG
- Pause/Unpause a DAG
- Get the Details of a DAG
- Explore grid view of a DAG
- Explore graph view of a DAG
- Explore Calendar view of a DAG
- Explore Task Duration view of a DAG
- Explore Details view of a DAG
- View the source code of a DAG
- Delete a DAG

## About Skills Network Cloud IDE

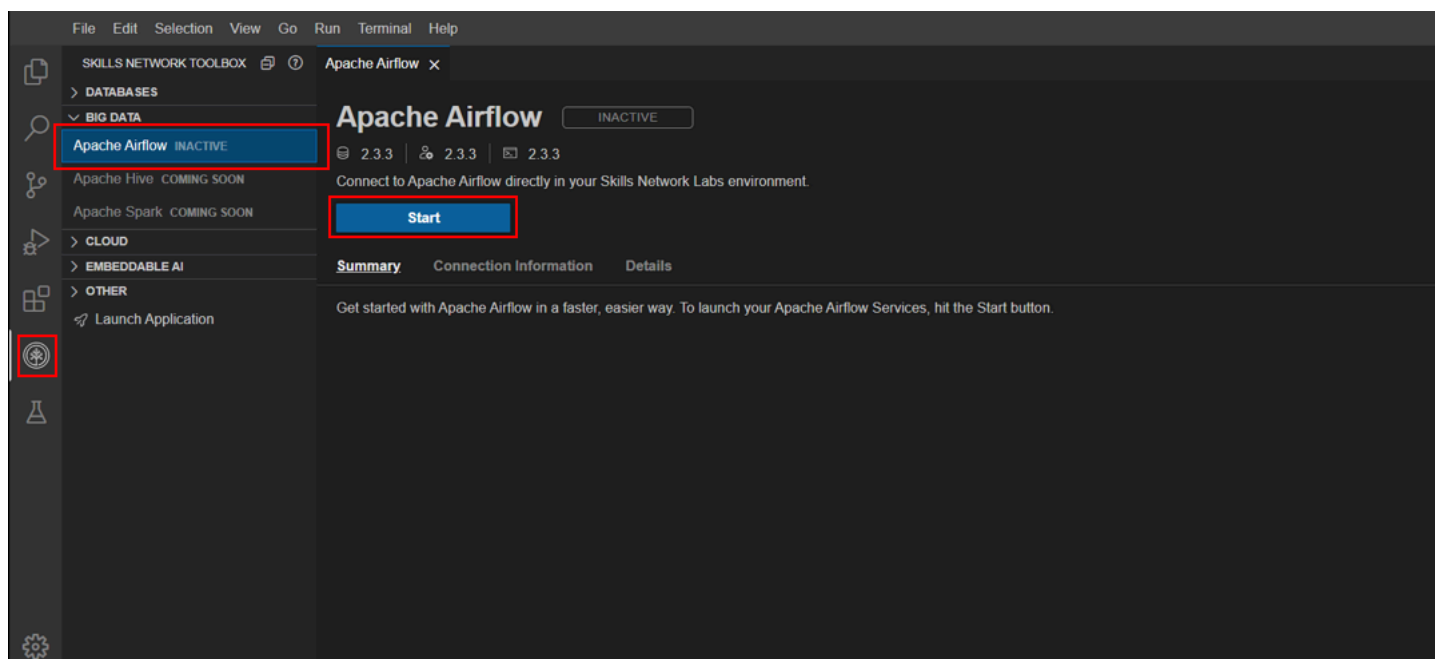
Skills Network Cloud IDE (based on Theia and Docker) provides an environment for hands on labs for course and project related labs. Theia is an open source IDE (Integrated Development Environment), that can be run on desktop or on the cloud. to complete this lab, we will be using the Cloud IDE based on Theia running in a Docker container.

## Important notice about this lab environment

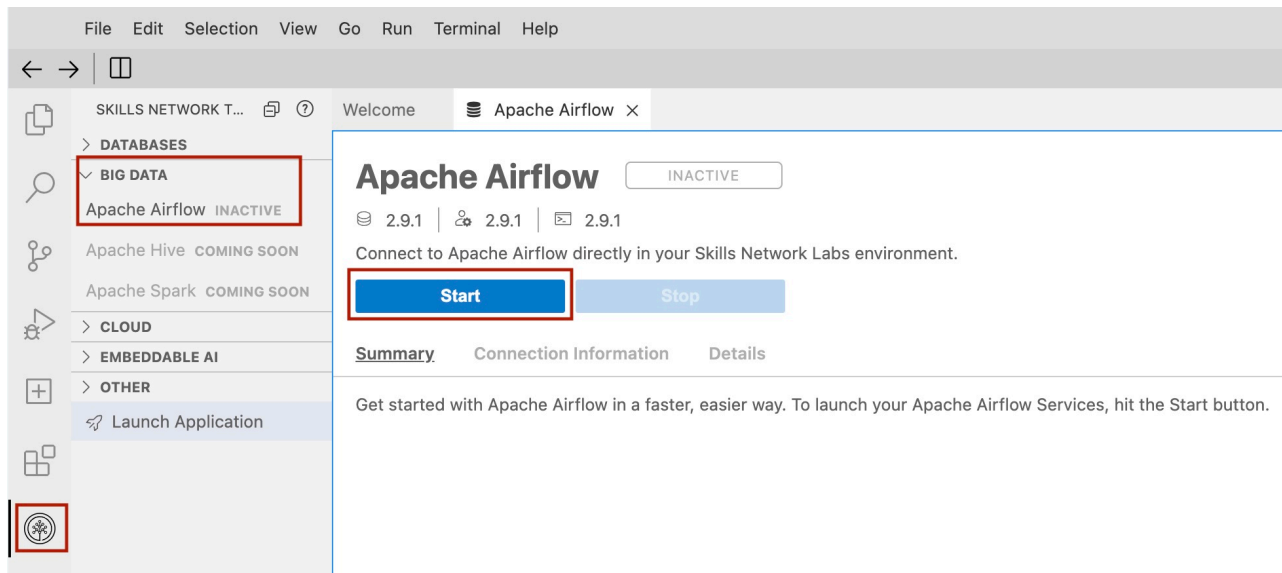
Please be aware that sessions for this lab environment are not persistent. A new environment is created for you every time you connect to this lab. Any data you may have saved in an earlier session will get lost. To avoid losing your data, please plan to complete these labs in a single session.

## Exercise 1: Start Apache Airflow

1. Click on **Skills Network Toolbox**.
2. From the **BIG DATA** section, click **Apache Airflow**.
3. Click **Start** to start the Apache Airflow.

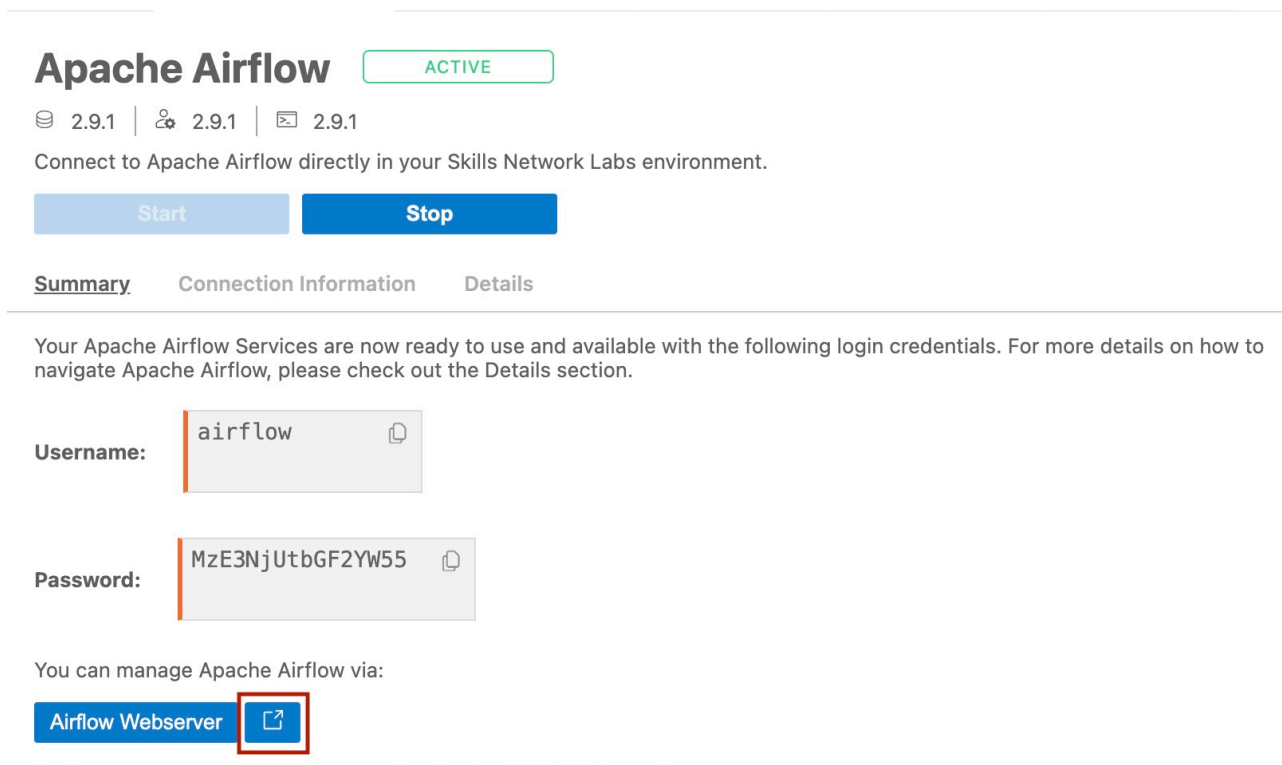


**Note:** Please be patient, it will take a few minutes for Airflow to get started.




## Exercise 2: Open the Airflow Web UI

When Airflow starts successfully, you should see an output similar to the one below. Once **Apache Airflow** has started, click on the highlighted icon to open **Apache Airflow Web UI** in the new window.



You should land at a page that looks like this.



Airflow

DAGs

Cluster Activity

Datasets


Security

Browse

Admin

Docs

03:53 UTC

 Log In

<div><div><div><div><div></div></div><div>example_bash_operator</div></div><div><div>example</div><div>example2</div></div></div><div>airflow</div><div><div><div></div><div></div><div></div><div></div></div></div><div>00***</div><div><div></div></div></div> <div>2024-05-29, 00:00:00</div> 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## Exercise 3: Submit a dummy DAG

For the purpose of monitoring, let's create a dummy DAG with three tasks.

- Task1 does nothing but sleep for 1 second.
- Task2 sleeps for 2 seconds.
- Task3 sleeps for 3 seconds.

This DAG is scheduled to run every 1 minute.

1. Using Menu->File->New File create a new file named dummy\_dag.py.
2. Copy and paste the code below into it and save the file.

```
1. 1
2. 2
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55. 55

1. # import the libraries
2.
```

```

3. from datetime import timedelta
4. # The DAG object; we'll need this to instantiate a DAG
5. from airflow import DAG
6. # Operators; we need this to write tasks!
7. from airflow.operators.bash_operator import BashOperator
8. # This makes scheduling easy
9. from airflow.utils.dates import days_ago
10.
11. #defining DAG arguments
12.
13. # You can override them on a per-task basis during operator initialization
14. default_args = {
15.     'owner': 'Your name',
16.     'start_date': days_ago(0),
17.     'email': ['your email'],
18.     'retries': 1,
19.     'retry_delay': timedelta(minutes=5),
20. }
21.
22. # defining the DAG
23. dag = DAG(
24.     'dummy_dag',
25.     default_args=default_args,
26.     description='My first DAG',
27.     schedule_interval=timedelta(minutes=1),
28. )
29.
30. # define the tasks
31.
32. # define the first task
33.
34. task1 = BashOperator(
35.     task_id='task1',
36.     bash_command='sleep 1',
37.     dag=dag,
38. )
39.
40. # define the second task
41. task2 = BashOperator(
42.     task_id='task2',
43.     bash_command='sleep 2',
44.     dag=dag,
45. )
46.
47. # define the third task
48. task3 = BashOperator(
49.     task_id='task3',
50.     bash_command='sleep 3',
51.     dag=dag,
52. )
53.
54. # task pipeline
55. task1 >> task2 >> task3

```

Copied!

3. Set the AIRFLOW\_HOME directory.

```

1. 1
1. export AIRFLOW_HOME=/home/project/airflow

```

Copied!

Executed!

4. Submitting a DAG is as simple as copying the DAG python file into dags folder in the AIRFLOW\_HOME directory. Open a terminal and run the command below to submit the DAG.

```

1. 1
1. cp dummy_dag.py $AIRFLOW_HOME/dags

```

Copied!

5. Verify that our DAG actually got submitted. Run the command below to list out all the existing DAGs.

```

1. 1
1. airflow dags list

```

Copied!

6. Verify that dummy\_dag is a part of the output.

```

1. 1
1. airflow dags list | grep dummy_dag

```

Copied!

7. Run the command below to list out all the tasks in dummy\_dag.

```

1. 1
1. airflow tasks list dummy_dag

```

Copied!

You should see 3 tasks in the output.

## Exercise 4: Search for a DAG

1. In the Web-UI, identify the Search DAGs text box as shown in the image below and type dummy\_dag in the textbox and press enter.

The screenshot shows the Airflow Skills Network interface. At the top, there's a navigation bar with links: Airflow, DAGs, Cluster Activity, Datasets, Security, Browse, Admin, and Docs. The current time is 01:11 UTC, and there's a 'Log In' button. Below the navigation bar, the title 'Skills Network Airflow' is displayed. A status bar shows 'All 59', 'Active 0', and 'Paused 59'. There are buttons for 'Running 0' and 'Failed 0'. A search box labeled 'Filter DAGs by tag' contains the text 'dummy\_dag'. Below the search box, there's an 'Auto-refresh' toggle and a refresh icon.

Note: It may take a couple of minutes for the dag to appear here. If you do not see your DAG, please give it a minute and try again.

2. You should see the `dummy_dag` listed as seen in the image below:

The screenshot shows the Airflow Skills Network interface with the 'dummy\_dag' listed. The status bar now shows 'All 1', 'Active 0', and 'Paused 1'. The search box still contains 'dummy\_dag'. Below the search box, there's an 'Auto-refresh' toggle and a refresh icon. A table lists the DAGs. The first row is for 'dummy\_dag', owned by 'Your name'. It shows a schedule of '0:01:00' and a next run time of '2024-06-06, 00:00:00'. The 'Recent Tasks' column shows a series of circles representing task status.

## Exercise 5: Pause/Unpause a DAG

1. Unpause the DAG using the Pause/Unpause button.

The screenshot shows the Airflow Skills Network interface with the 'dummy\_dag' listed. A red arrow points to the 'Pause/Unpause DAG' button in the 'Actions' column of the DAG list. The status bar shows 'All 1', 'Active 0', and 'Paused 1'. The search box still contains 'dummy\_dag'. Below the search box, there's an 'Auto-refresh' toggle and a refresh icon. The table lists the DAGs. The first row is for 'dummy\_dag', owned by 'Your name'. It shows a schedule of '0:01:00' and a next run time of '2024-06-06, 00:00:00'. The 'Recent Tasks' column shows a series of circles representing task status.

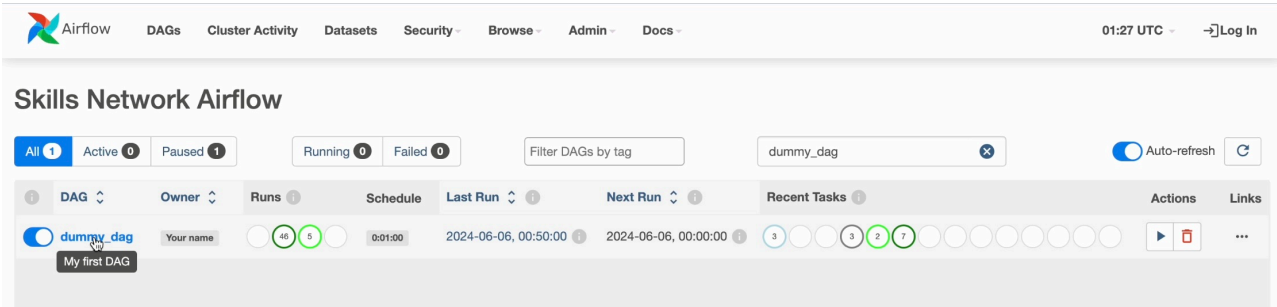
2. You can see the following details in this view.

- Owner of the DAG
- How many times this DAG has run
- Schedule of the DAG
- Last run time of the DAG
- Recent task status

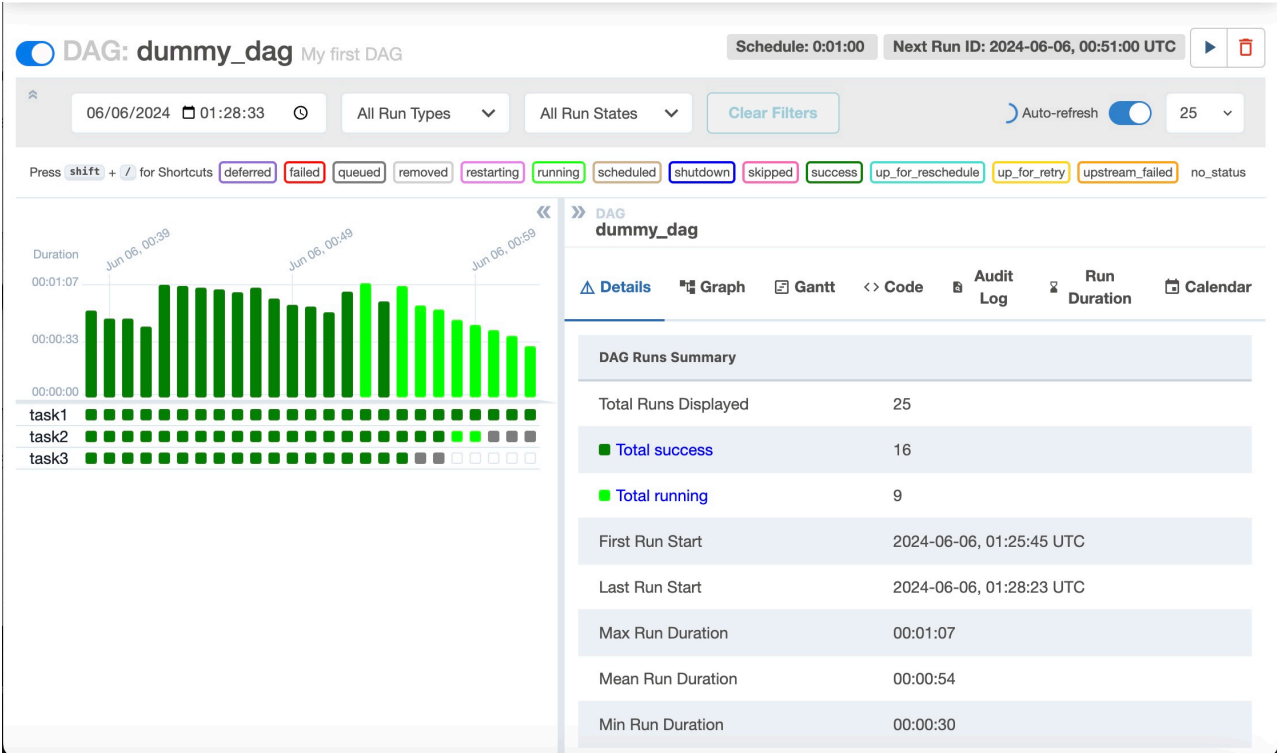
The screenshot shows the Airflow Skills Network interface with the 'dummy\_dag' listed. The status bar shows 'All 1', 'Active 0', and 'Paused 1'. The search box still contains 'dummy\_dag'. Below the search box, there's an 'Auto-refresh' toggle and a refresh icon. The table lists the DAGs. The first row is for 'dummy\_dag', owned by 'Your name'. It shows a schedule of '0:01:00' and a next run time of '2024-06-06, 00:11:00'. The 'Recent Tasks' column shows a series of circles representing task status, with some circles highlighted in green.

## Exercise 6: Detailed view of a DAG

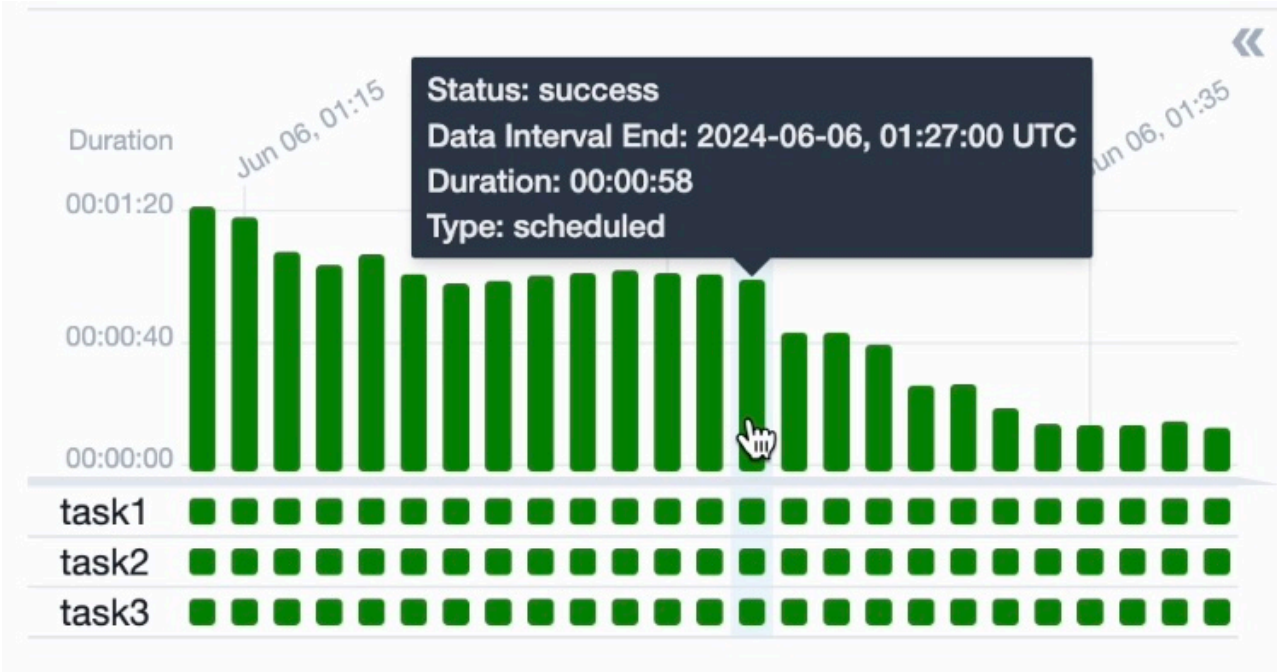
1. Click on the DAG name as shown in the image below to see the detailed view of the DAG.



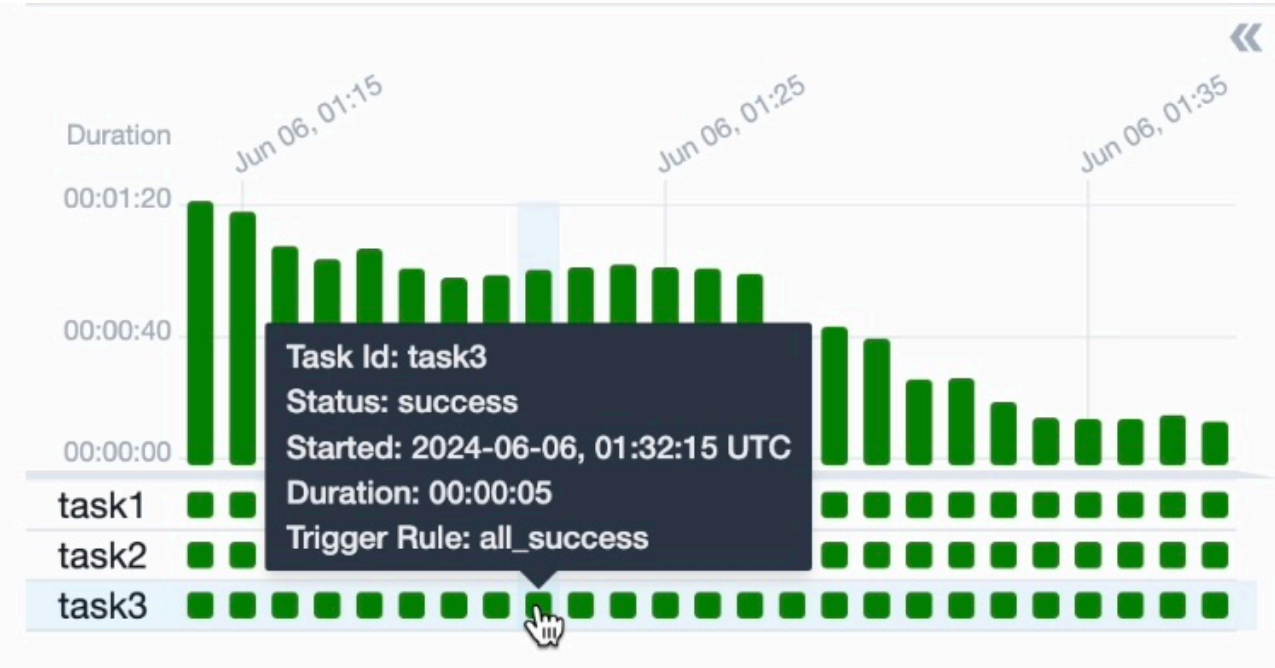
2. You will land on a DAG details page showing the default grid view with the three tasks listed.



The Grid view shows your DAG tasks in the form of grids as seen in the image. You will observe the Auto Refresh button switched on by default on the right corner. The grids in the image represent a single DAG run and the color indicates the status of the DAG run. Place your mouse on any grid to see the details.

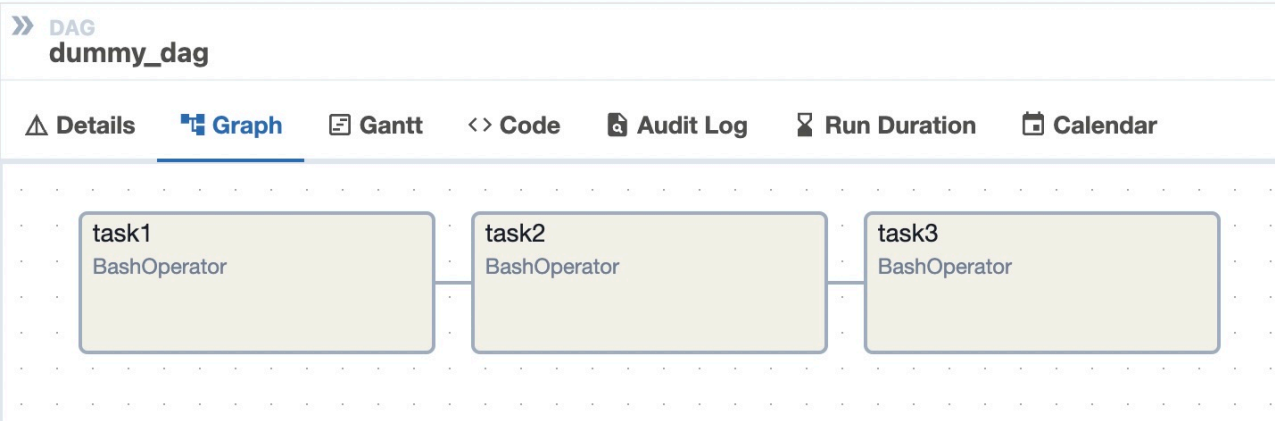


The squares in the image below represent a single task within a DAG run and the color indicates its status. Place your mouse on any square to see the task details.



## Exercise 7: Explore graph view of DAG

1. Click on the Graph View button to open the graph view. The graph view shows the tasks in a form of a graph. With the auto refresh on, each task status is also indicated with the color code.

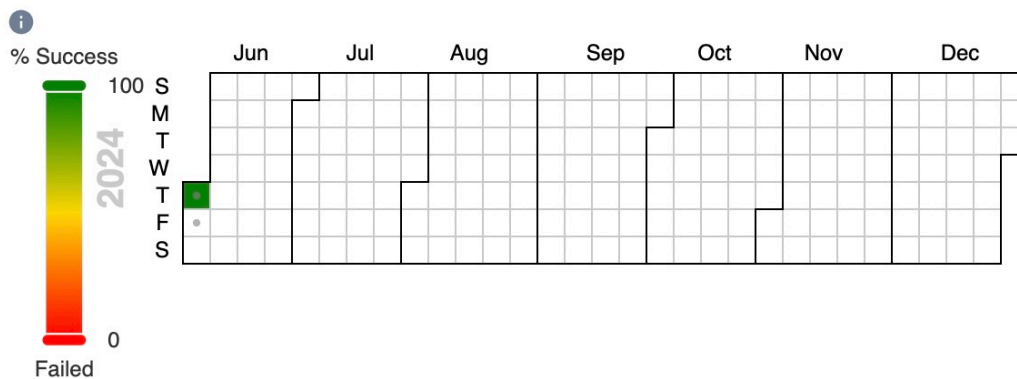


## Exercise 8: Calender view

The calender view gives you an overview of all the dates when this DAG was run along with its status as a color code.

## >> DAG dummy\_dag

Details Graph Gantt Code Audit Log Run Duration Calendar

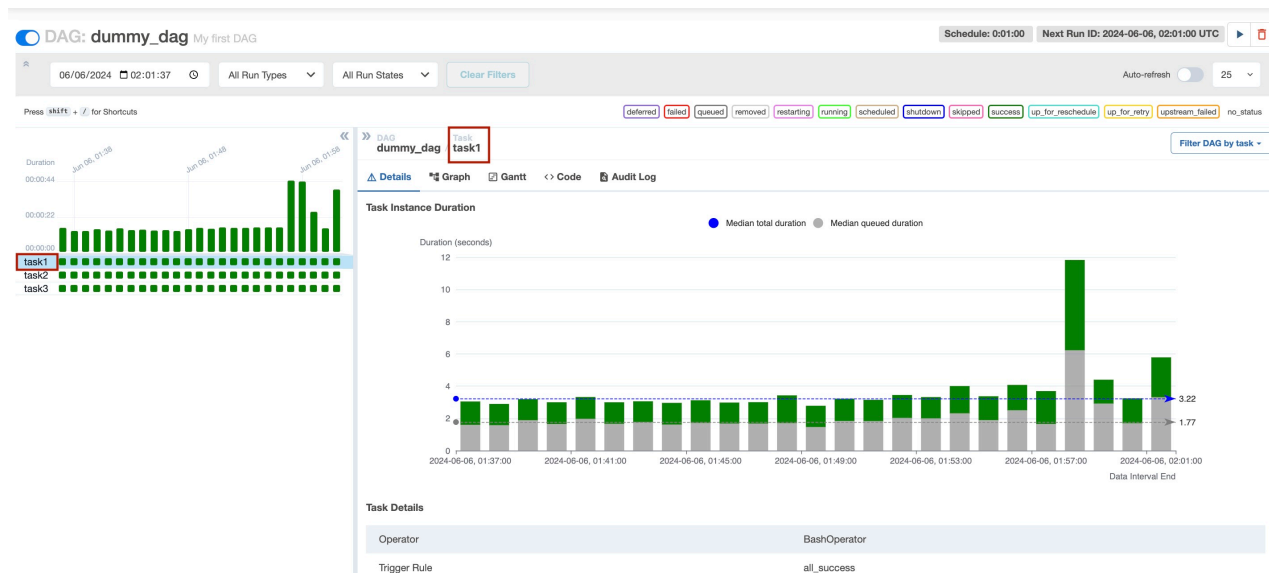


## Exercise 9: DAG and Task Duration view

The DAG duration gives you an overview of how much time the entire workflow took.



The Task Duration view gives you an overview of how much time each task took to execute, over a period of time.





# Exercise 10: Details view

The Details view give you all the details of the DAG as specified in the code of the DAG.

>> DAG

dummy\_dag

Details

Graph

Gantt

<> Code

Audit Log

Run Duration

Calendar

DAG Runs Summary

Total Runs Displayed

25

Total success

25

First Run Start

2024-06-06, 01:32:20 UTC

Last Run Start

2024-06-06, 01:54:00 UTC

Max Run Duration

00:00:38

Mean Run Duration

00:00:16

Min Run Duration

00:00:13

DAG Summary

Total Tasks

3

BashOperators

3

DAG Details

Dag display name

dummy\_dag

Dag id

dummy\_dag

Description

My first DAG

Fileloc

/home/project/airflow/dags/dummy\_dag.py

Has import errors

false

Has task concurrency limits

false

Is active

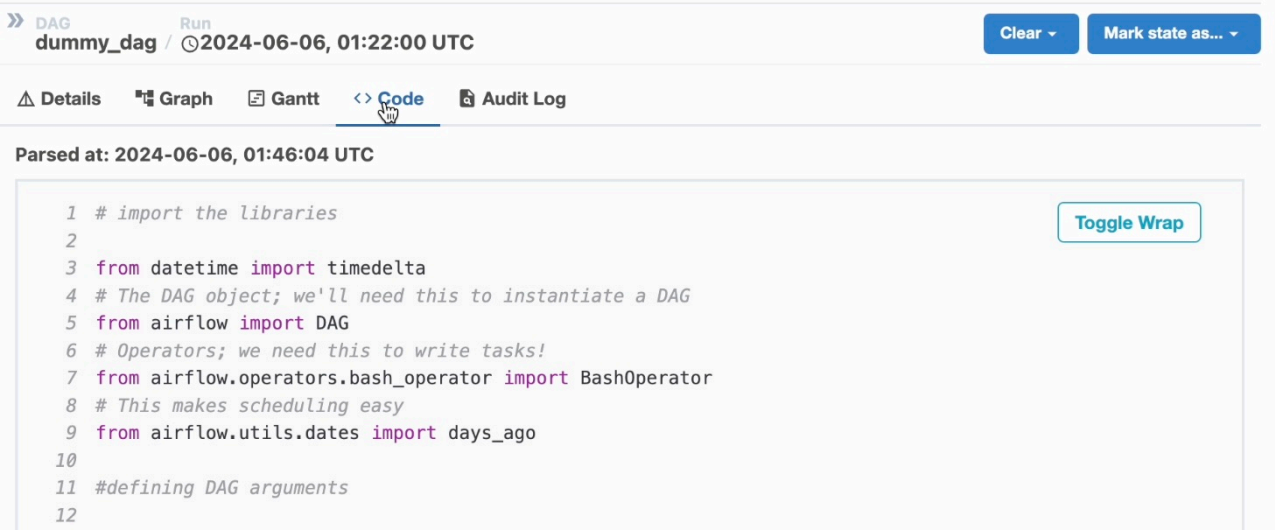
true

Is paused

false

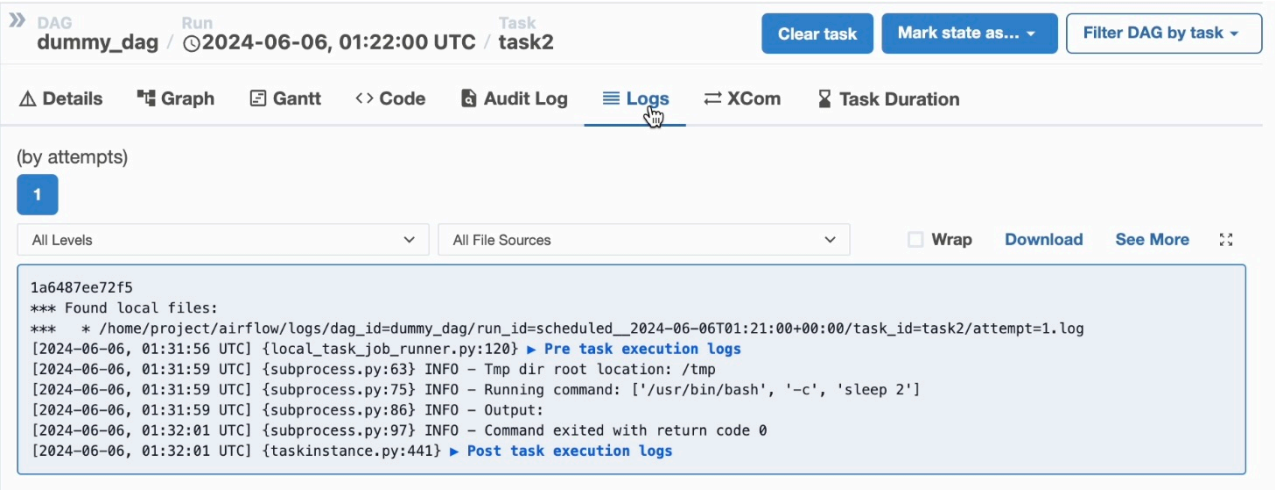
# Exercise 11: Code view

The Code view lets you view the code of the DAG.



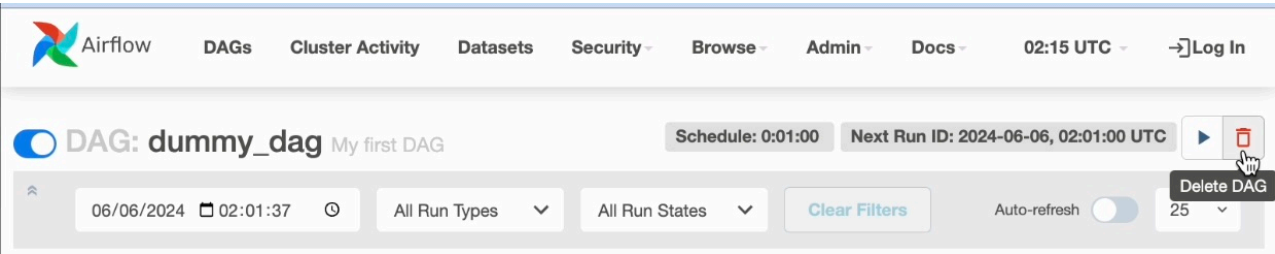
Exercise 12: Task logs

You can view the logs of an individual task with task logs.

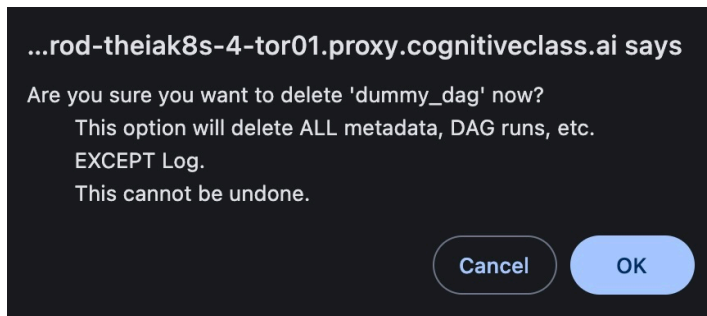


Exercise 13: Delete a DAG

To delete a DAG click on the delete button.



You will get a confirmation pop up as shown in the image below. Click OK to delete the DAG.



## Practice exercises

1. Unpause any existing DAG and monitor it.
2. View the details on any existing DAG. View the code of the DAG. Delve into the task details and view the logs of each task.

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