Workflows Lab & Advanced Scheduling Options

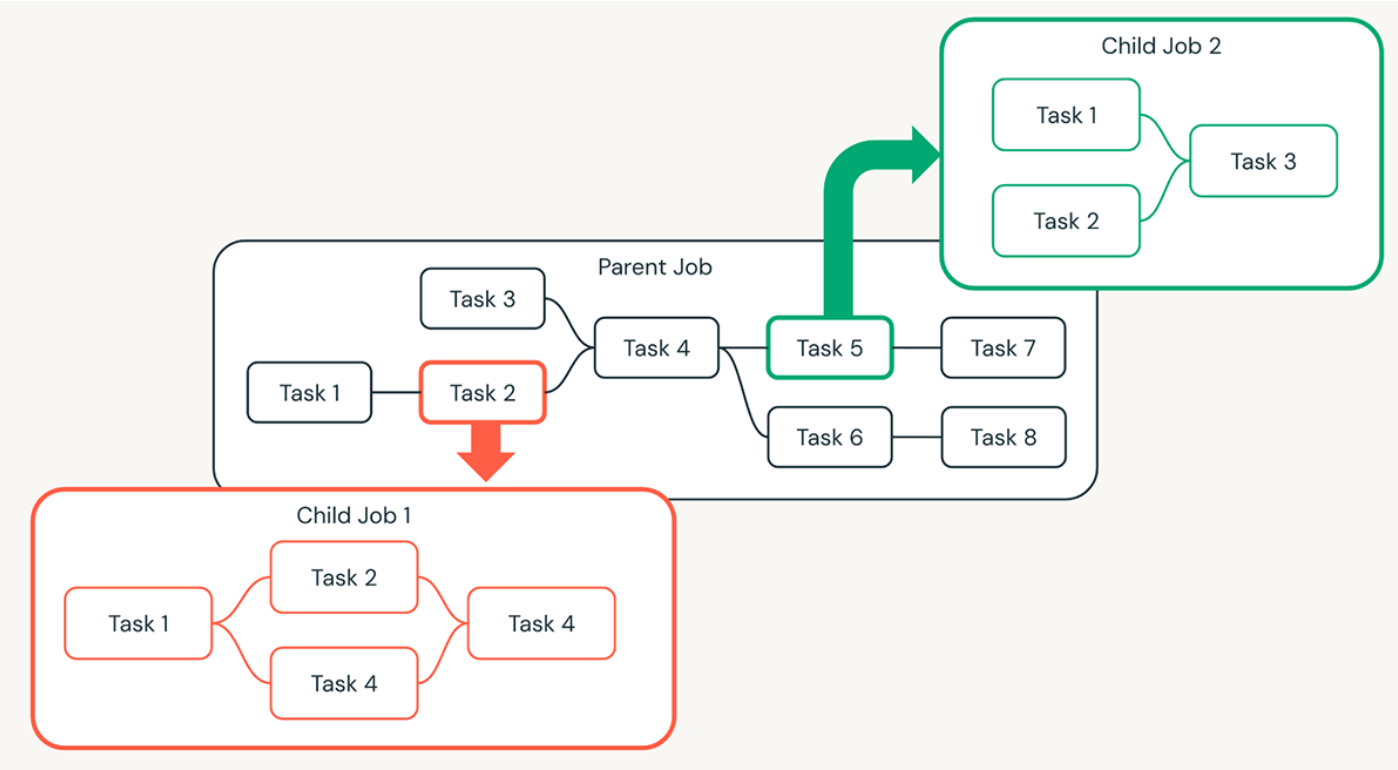
Exploring workflow setups and scheduling features

Agenda Overview

- End-to-End Workflow Setup
- Demo: Building an End-to-End Workflow
- Sample Code for Notebooks
- Advanced Scheduling Features
- Cron Expression Examples
- Hands-On Lab and Challenge

End-to-End Workflow Setup

Key Points of Workflow Setup



Chaining Tasks

Chaining multiple tasks in a job enhances efficiency by organizing and managing various processes together.

Output Passing

Passing outputs between tasks is essential for creating seamless data flows in workflows, ensuring continuity.

Setting Dependencies

Establishing dependencies is crucial for reliable data pipelines, ensuring tasks execute in the correct order.

Workflow DAG Diagram

Understanding DAG

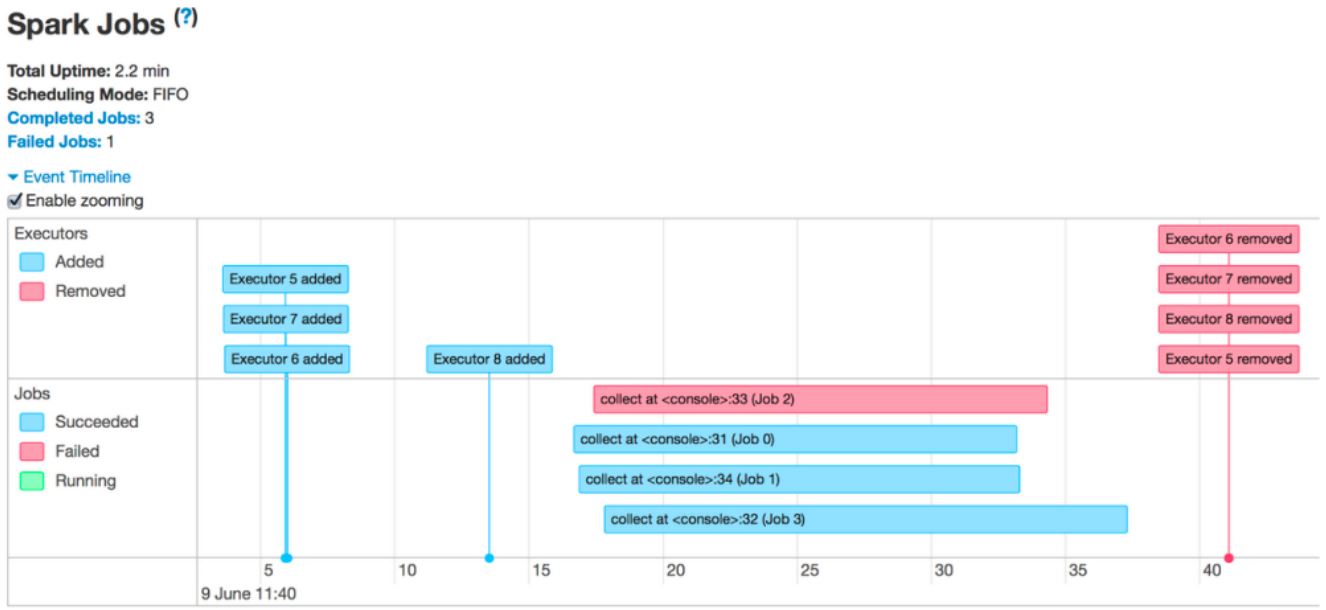
A Directed Acyclic Graph is used to represent workflows with multiple tasks that have dependencies.

Task Dependencies

In a workflow DAG, tasks are interconnected, and their execution order is determined by their dependencies.

Applications of DAG

DAGs are widely used in computer science, project management, and scheduling to optimize workflows.



Demo: Building an End-to-End Workflow

Sample Code for Notebooks

data_prep_notebook

dbutils.widgets.text("input_data", "LabData2025", "Input Data Name")

input_data = dbutils.widgets.get("input_data")

import pandas as pd

Simulate ETL

*df = pd.DataFrame({'id': range(10), 'value': [x*2 for x in range(10)]})*

df_clean = df[df['id'] % 2 == 0]

dbutils.notebook.exit(df_clean.to_json())

Notebook 1: Data Prep

Data Input Widget

The code snippet initializes a widget for inputting the data name, crucial for data processing workflows.

ETL Simulation

The sample code simulates an Extract, Transform, Load (ETL) process using a simple DataFrame.

Data Cleaning

The DataFrame is filtered to clean the data, which is essential for accurate analysis and insights.

```
# Notebook: data_prep_notebook
dbutils.widgets.text("input_data",
"LabData2025", "Input Data Name")
input_data =
dbutils.widgets.get("input_data")
import pandas as pd
# Simulate ETL
df = pd.DataFrame({'id': range(10), 'value':
[x*2 for x in range(10)]})
df_clean = df[df['id'] % 2 == 0]
dbutils.notebook.exit(df_clean.to_json())
```

Notebook 2: Data Analysis

Sample Code Overview

This slide presents sample code for data analysis using Python. It illustrates how to read JSON data and calculate sums.

Data Input Widget

The code utilizes a widget to input JSON data, enhancing interactivity for users conducting data analysis.

DataFrame and Analysis

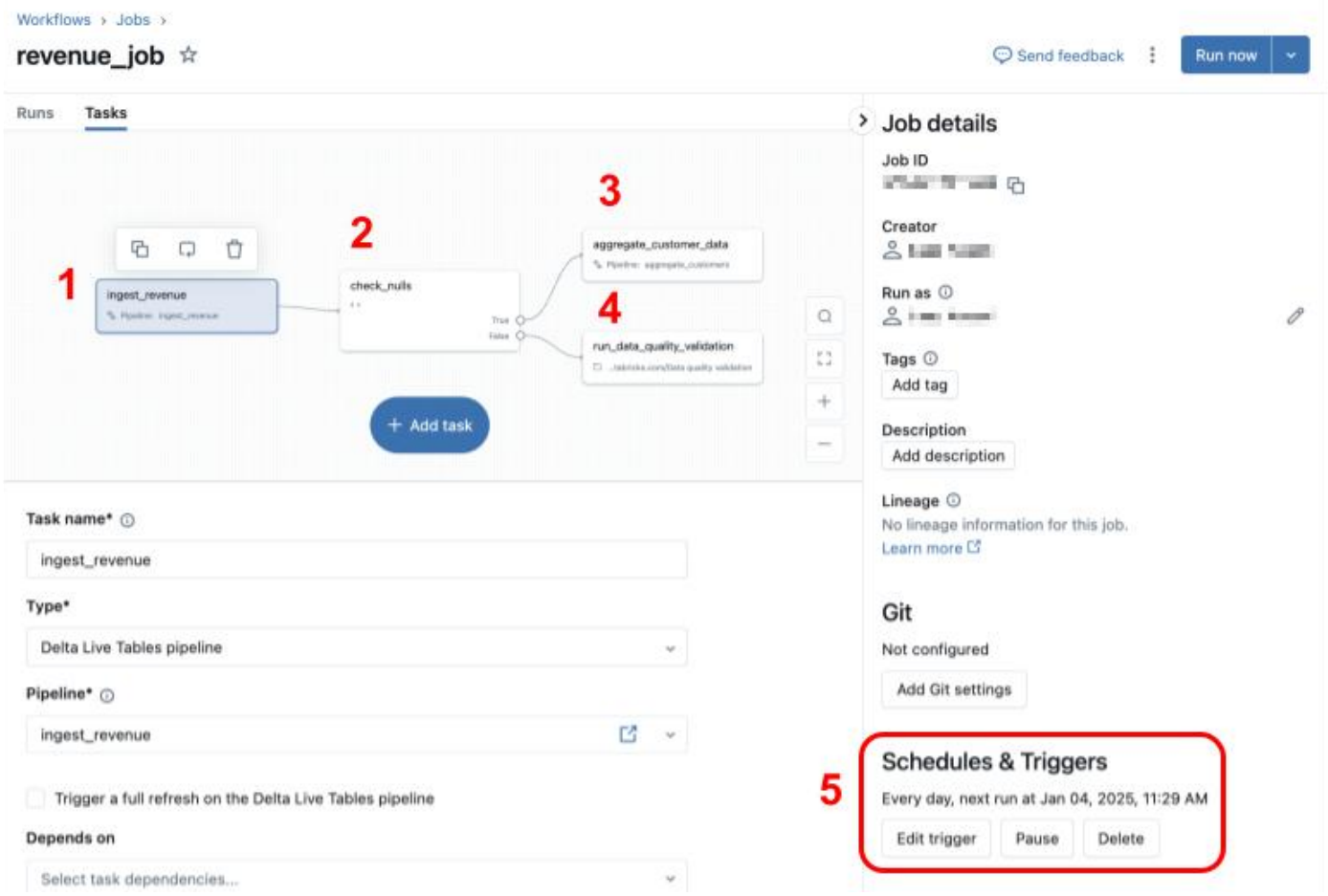
Using Pandas, the code converts JSON into a DataFrame and performs analysis, such as summing specific values.

data_analysis_notebook

```
dbutils.widgets.text("input_json", "",
"Input Data JSON")
import pandas as pd
input_json =
dbutils.widgets.get("input_json")
df = pd.read_json(input_json)
print("Sum of values:",
df['value'].sum())
display(df)
```

Advanced Scheduling Features

Key Features of Advanced Scheduling



Multiple Schedules

Advanced scheduling allows for setting multiple schedules for the same job, enhancing flexibility and efficiency.

Complex Cron Expressions

Users can utilize complex cron expressions to run jobs on specific days and times, providing precise control.

Pause/Resume Controls

Advanced scheduling features include pause/resume options and concurrency controls to manage job execution effectively.

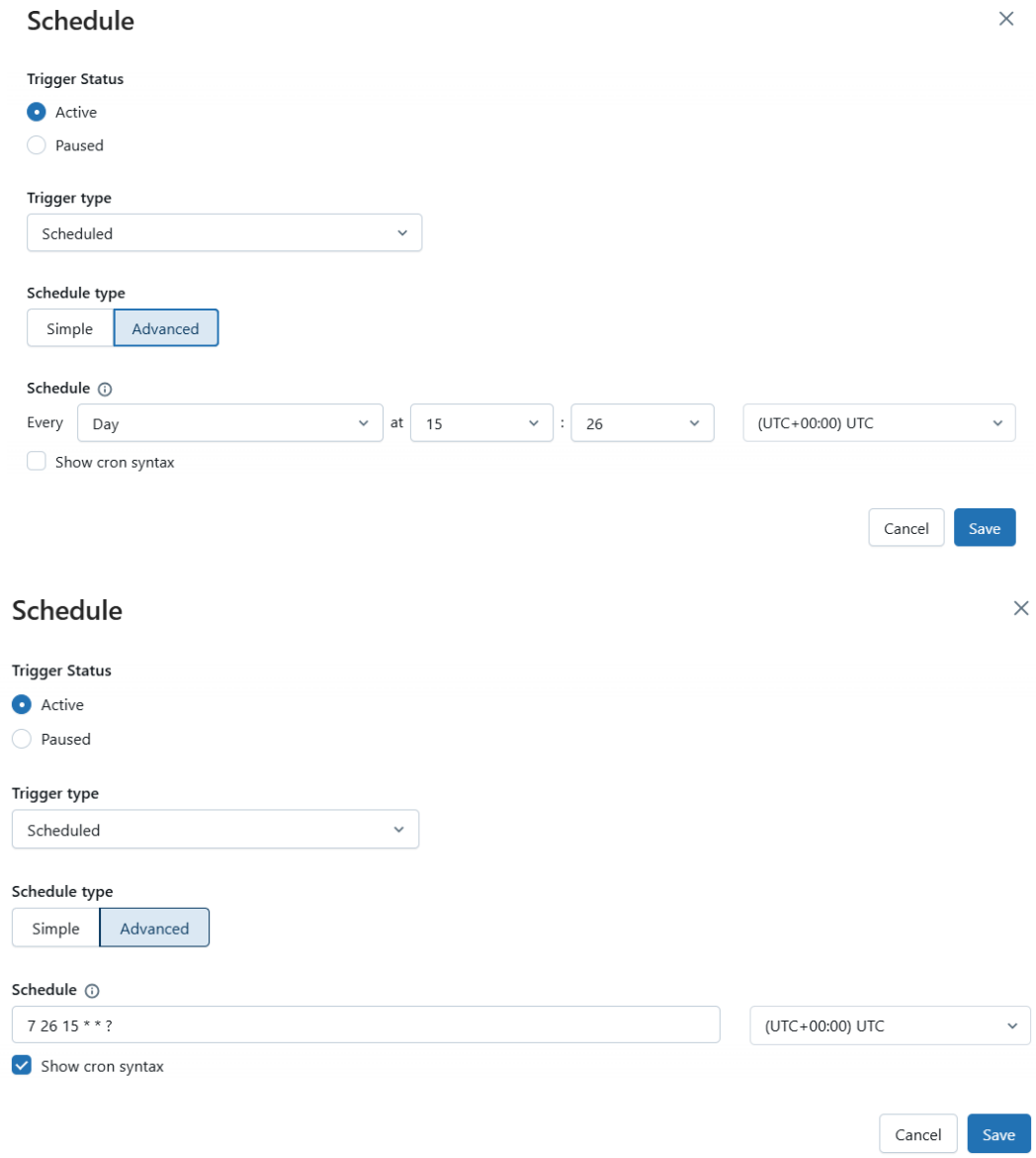
Jobs UI Screenshot

Advanced Scheduling Features

The Jobs UI includes advanced scheduling options that allow users to set multiple schedules for tasks.

Cron Entry Box

The cron entry box enables users to define specific time intervals for job execution, providing flexibility.



Cron Expression Examples

Common Cron Expressions

Weekday Scheduling

Cron expression for executing tasks every weekday at 8 AM is represented by 0 8 * * 1-5.

Monthly Scheduling

To schedule a task on the first day of every month, use the expression 0 0 1 * *.

Frequent Scheduling

The expression */30 * * * * allows tasks to run every 30 minutes, ensuring frequent execution.

Hands-On Lab and Challenge

Lab Objectives and Steps

Workflow Creation

Build a comprehensive workflow consisting of at least two tasks, ensuring proper dependencies are configured.

Data Passing Between Tasks

Utilize notebook exit and parameter passing to effectively transfer data between the tasks in the workflow.

Scheduling Workflows

Incorporate at least two different schedules into the workflow, using an advanced cron expression for one of them.