

# Fans Meeting Platform

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# SAS Studio Flows and Scheduling

# SAS Studio – Flows

The screenshot displays the SAS Studio interface for developing flows. The top navigation bar includes 'New', 'Options', 'View', 'Open', and 'Save All'. The main workspace shows a flow diagram for 'CAS\_Tables\_Example.flw' with the following steps:

- Generate SAS librefs for...** (yellow icon)
- Delete Table or File from...** (yellow icon)
- CONTACT\_LIS T** (Table icon)
- DQ Code** (yellow icon)
- Table** (Table icon)
- Query** (blue icon) - three parallel paths
- Table** (Table icon) - three parallel paths
- Promote Tables and...** (yellow icon)

The bottom pane shows the 'Table' properties for the selected node, displaying a preview of data for the 'GENDER' table. The table has 55 rows and 11 columns. The first four rows are shown below:

	Name	Address	City	State	Zip	Phone	UpdateDate	Gen...	State_Stnd	Name_Stnd	Address_Stnd
1	Susan Wo...	152 Black...	Hardy	VA	24101	(679) 592-...	1/1/2018	F	VA	Susan Woodw...	152 Blackberry Ln
2	James Bri...	1507 Bear...	Pearisburg	Virginia	24134-2365	(717) 977-...	1/1/2018	M	VA	James Briggs	1507 Bear Springs Rd
3	Sue Woo...		Hardy	VA		679-592-0...	1/2/2018	F	VA	Sue Woodward	
4	Stacey Rh...	14920 Rail...	Midland	MD	21532-4835		1/3/2018	U	MD	Stacey Rhome	14920 Railroad St



# SAS Studio – Flows

Create a Flow

The screenshot displays the SAS Studio interface. The top blue header contains the text "SAS® Studio - Develop SAS Code" and search, refresh, and user icons. Below the header is a menu bar with "New", "Options", "View", "Open", and "Save All". The "New" menu is open, showing options: "SAS program", "Python program", "Flow", "Query", "Custom step", "Quick import", "Job", "Task", and "More file types". The "Flow" option is highlighted with a red box. In the main workspace, a "Let's get to work!" message is displayed with the text "Get started with a new program, flow, or query your data." Below this are three options: "Program in SAS", "Build a flow", and "Import data". The "Build a flow" option is highlighted with a red box. To the right, a diagram shows a flow starting with a yellow square, branching into two blue squares, and ending with a grey circle. The bottom status bar shows "Ready" on the left and "Recover (0) | Submission (0)" on the right.

# Flow steps – Flows

Flow tab section

Flow file name

Flow properties

Preview tab (Node properties) section

Submission order

No locking of flow files. Receive a warning that another user has changed it when saving file.

Add Notes to the step (node)

Table Properties Options Published Columns Preview Data Node Notes

GENDER

Enter expression

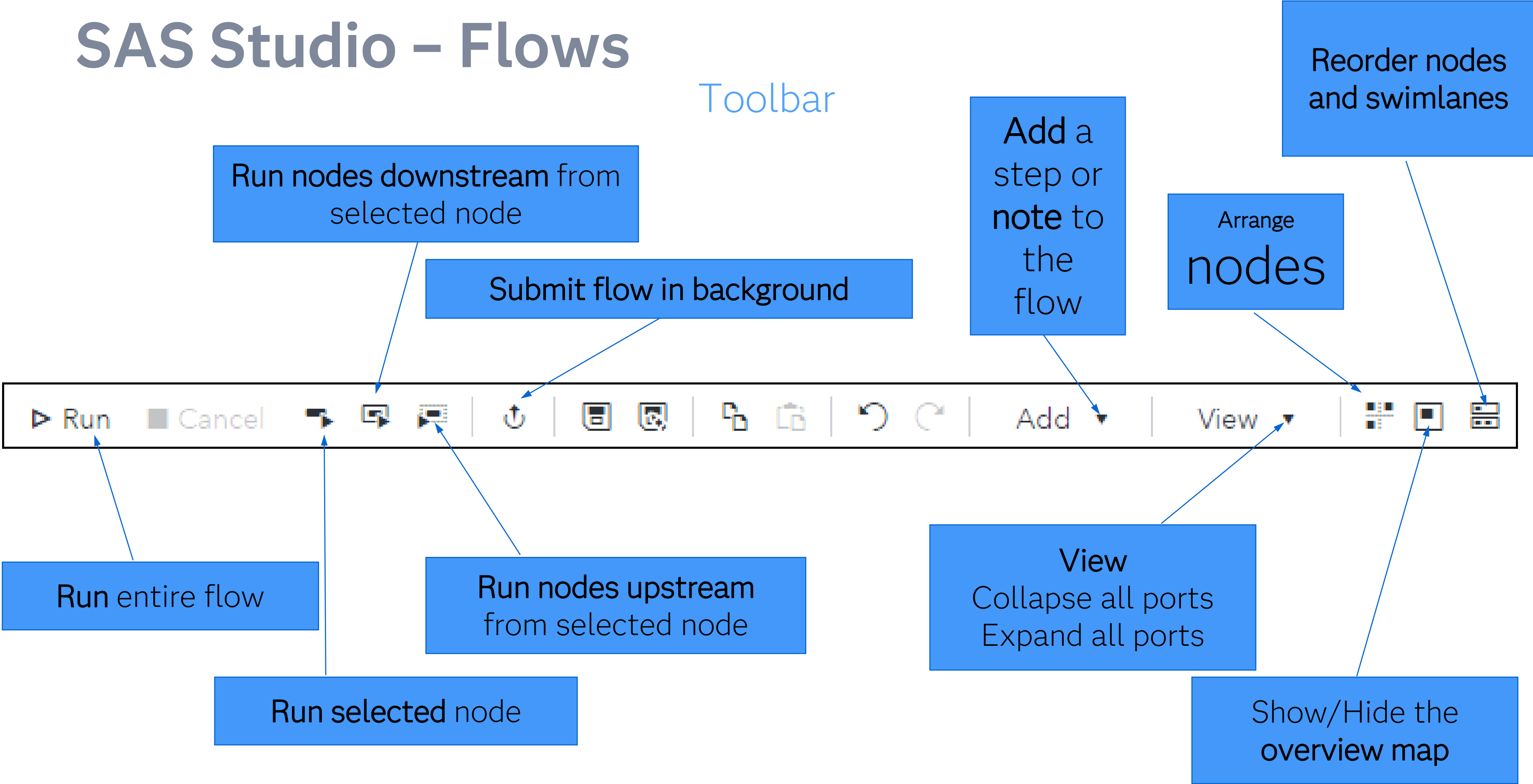
	Name	Address	City	State	Zip	Phone	UpdateDate	Gen...	State_Stnd	Name_Stnd	Address_Stnd
1	Susan Wo...	152 Black...	Hardy	VA	24101	(679) 592-...	1/1/2018	F	VA	Susan Woodw...	152 Blackberry Ln
2	James Bri...	1507 Bear...	Pearisburg	Virginia	24134-2365	(717) 977-...	1/1/2018	M	VA	James Briggs	1507 Bear Springs Rd
3	Sue Woo...		Hardy	VA		679-592-0...	1/2/2018	F	VA	Sue Woodward	
4	Stacey Rh...	14920 Rail...	Midland	MD	21532-4835		1/3/2018	U	MD	Stacey Rhome	14920 Railroad St

rows: 55 | Columns: 11 of 11 | Rows 1 to 55

Recover (0) Submission (0)

# SAS Studio – Flows

## Toolbar



# Additional Actions

Schedule the flow as a job

Download log or results

Adjust layouts of Flow tab and/or Preview tab

Additional actions and its availability varies by node

The screenshot shows the SAS Studio interface with a flow diagram and a data table. The flow diagram includes steps like 'Create CAS Session', 'Process Tables', and 'Promote Tables and...'. The data table shows columns for Name, Address, City, State, Phone, and UpdateDate.

Callout boxes highlight the following actions:

- Schedule the flow as a job**: Points to the 'Schedule as a job' option in the context menu.
- Download log or results**: Points to the 'Download' option in the context menu.
- Adjust layouts of Flow tab and/or Preview tab**: Points to the 'Flow tab layout' and 'Preview tab layout' options in the context menu.
- Additional actions and its availability varies by node**: Points to the 'Refresh' and 'View tabs' options in the table's context menu.

# SAS Studio – Flows

Content

Delete selected flow file

File Maintenance

Additional actions:

- Rename
- Add as shortcut
- Move to folder

The screenshot displays the SAS Studio interface. The top navigation bar includes a hamburger menu icon and the text "SAS® Environment Manager - Manage Environment". The main content area is divided into a left sidebar and a right pane. The sidebar, titled "Content", shows a tree view with folders like "Public" and "Custom Steps", and files such as "CAS\_Tables\_Example.flw", "Example\_Program.sas", and "Magic8Ball\_Example.py". A toolbar above the sidebar contains icons for file operations, with a red box highlighting the "Export/Import content" icon. The right pane shows the "Basic Properties" for the selected file "CAS\_Tables\_Example.flw". The "Type" field is highlighted with a red box and labeled "Type: Studio flow". Other properties include "Name", "URI", "Description", "Location", and "Version".

Export/Import content

View/Edit authorization for selected flow file

Type: Studio flow

Basic Properties	
Name:	CAS_Tables_Example.flw
URI:	/dataFlows/dataFlows/aee57a39-9bfa-458f-98af-23c68a1827e6
Description:	
Type:	Studio flow
Location:	/Public/CAS_Tables_Example.flw
maquee	
maquee	
Version:	2



# Subflows

Adding another flow to current flow

# Subflows\*

The screenshot displays the SAS Studio interface for developing code and flows. The Explorer pane on the left shows the project structure, with subflows 'CAS Initialize.flw' and 'CAS Terminate.flw' highlighted in red. The main workspace shows a flow diagram for 'Car\_Make\_with\_SubFlows.flw'. The flow includes a 'Create CAS Session' subflow (CAS Initialize), a 'Cars Info' section with 'CARS' and 'Car\_Make\_Info' subflows, an 'Import' step, a 'Query' step, and a 'CAS Table' section with 'SAS Program' and 'CAS Terminate' subflows. The 'CAS Initialize' and 'CAS Terminate' subflows are highlighted with red boxes. A yellow callout box on the right contains the text: '\* SAS Studio (Analyst) license required'.

\* SAS Studio (Analyst) license required

# Create flow from sas program

# Create a SAS Studio Flow from a SAS Program

Create flow from program

The screenshot shows the SAS Studio interface. At the top, a code editor window titled 'Example\_Program.sas' contains the following SAS code:

```
1 data animal;  
2 input common $ animal $;  
3 data lines;  
4 a Ant
```

A red box highlights the 'Code to Flow' button in the toolbar, which has opened a context menu with the following options:

- Schedule as a job
- Create flow from program
- Add to My Favorites

Below the code editor, the 'Flow' tab is active, displaying a flow diagram. The flow starts with two 'DATASTEP' nodes. The top 'DATASTEP' node outputs to an 'ANIMAL' table. The bottom 'DATASTEP' node outputs to a 'PLANT' table. Both 'ANIMAL' and 'PLANT' tables serve as 'Input table 1' and 'Input table 2' respectively for a central 'DATASTEP' node. This central 'DATASTEP' node outputs to a 'MERGED\_DAT A' table, which is then processed by a 'PRINT' node.

# SAS Viya: SAS Studio Flow and Custom Steps

SAS Studio – Creating Jobs in SAS  
Environment Manager

# Schedule as a Job

The screenshot shows the SAS Explorer interface. The left sidebar contains a tree view with folders like 'My Favorites', 'Folder Shortcuts', 'SAS Server', and 'SAS Content'. Under 'SAS Content', there is a folder 'examples' containing 'Migration'. A file 'Example\_Program.sas' is selected and highlighted with a red box. A context menu is open over this file, with the option 'Schedule as a job' highlighted by a red rectangle.

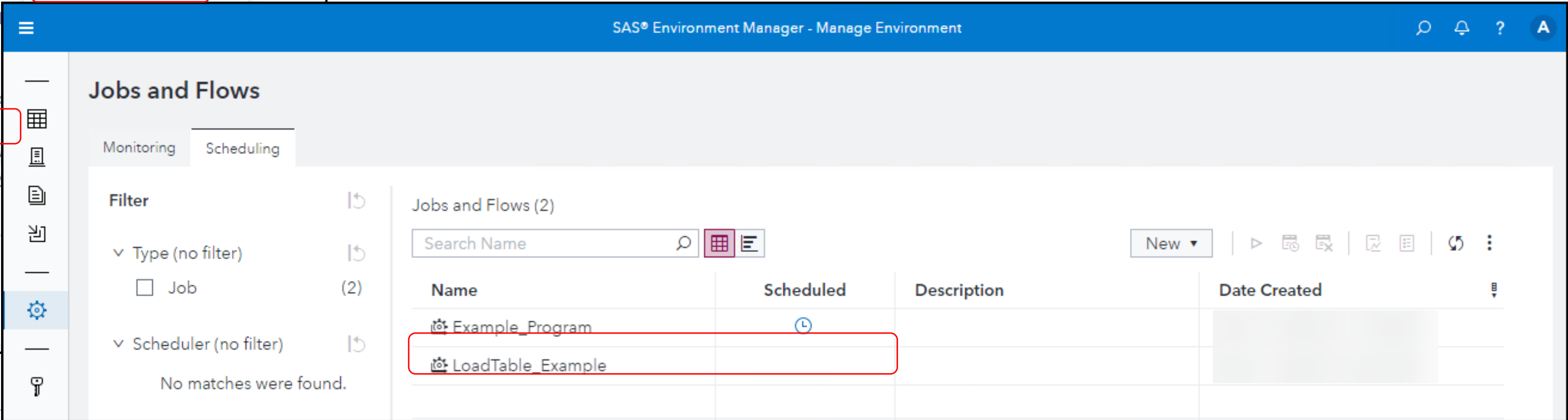
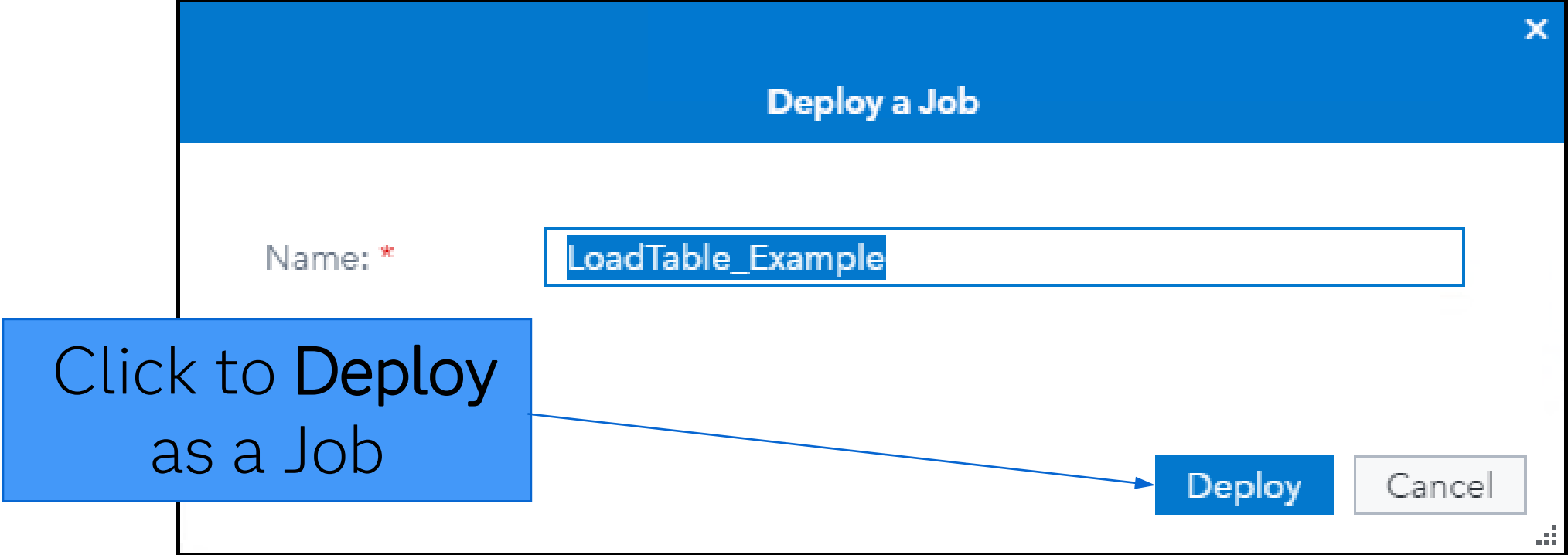
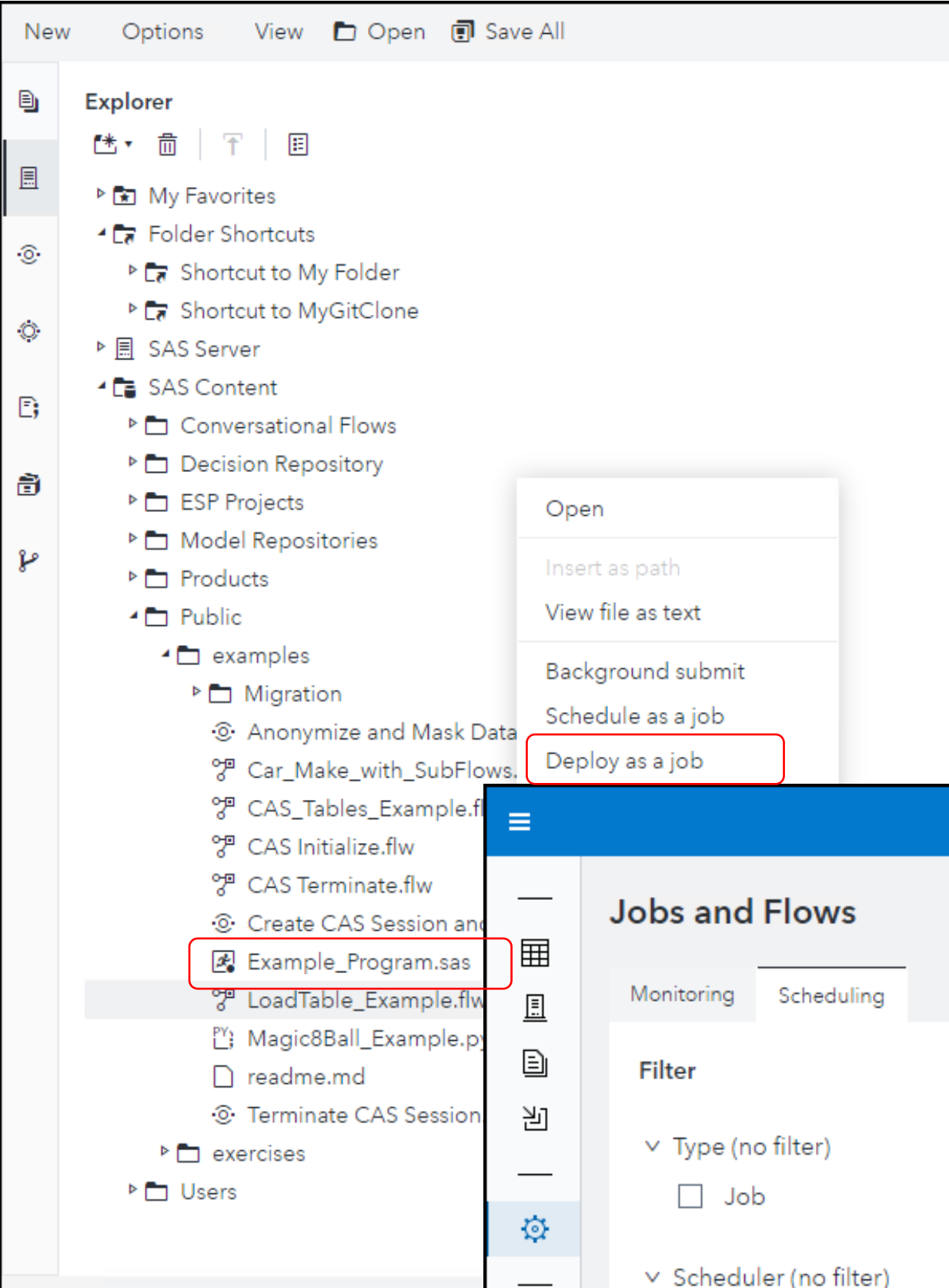
The screenshot shows the 'New Trigger' dialog box. It has a blue header and contains the following fields:

- Frequency: Daily (dropdown)
- Interval: 1 (input field) ^ days
- Time: \* 13:30 (time picker)
- Time zone: (UTC-05:00) New York (time zone picker)
- Start date: (calendar picker)
- End: Never (dropdown)

The screenshot shows the 'SAS Environment Manager - Manage Environment' interface. The 'Jobs and Flows' section is active, with the 'Scheduling' tab selected. A table displays the following job:

Name	Scheduled	Description	Date Created
Example_Program	🕒		

# Deploy as a Job



# Schedule the job

### Schedule Job

Name:

Run as:

Trigger type:

Available triggers

<input type="checkbox"/>	Name	Enabled
<input type="checkbox"/>	<input type="text" value="Time Trigger 12:00PM"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>		
<input type="checkbox"/>		

### New Schedule

Frequency:  Interval:  days

Time:

Time zone:

Start date:

Ends:

- Never
- After number of times
- On date

flowfrompgm



January 25, 2024 at 10:22:28 AM



# SAS Studio licenses

# Functional differences

Feature	SAS Studio	SAS Studio Analyst	SAS Studio Engineer
Basic functionalities	Yes	Yes	Yes
Data management	Limited	Extended	Advanced
Statistical analysis	Basic	Advanced	Advanced with prediction and machine learning
Programming tools	SAS Data Language (SAS)	SAS Data Language (SAS)	SAS Data Language (SAS) and Python
Code sharing and collaboration	Yes	Yes	Yes
Job management	Limited	Extended	Advanced
Integration with other SAS tools	Limited	Extended	Advanced

# Scheduling

Understanding Workload Management

# Scheduling Jobs in SAS Viya

- Scheduling is now part of the base Viya platform, not SAS Workload Management
- You can specify that jobs are submitted to the grid at a certain time of day
- Execution windows can also be specified for a queue

# Using Third Party Schedulers

- Many customers already have an enterprise scheduler which can be used to submit jobs to SAS Viya and the SAS Workload Orchestrator
- At a high level, the Scheduler submits a command like the batch CLI command
- The scheduler monitors the execution of the job and takes actions based on its return code

# SAS Environment Manager – Jobs and Flows

- Define Job Requests and include them in Job Flows, which can be scheduled (time-based triggers)
- Jobs in a flow are individually submitted to Workload Orchestrator

Jobs and Flows

Monitoring Scheduling

Jobs Filter

▼ Status (no filter)

- Canceled
- Successful
- Failed
- Pending
- Running
- Timed Out
- Unknown

Monitor (4)

Filter by name

Filter by: Previous hour

Name	Start Date	Status	Created By	Log
Henrik's Daily Job 2	June 30, 2022 04:36:5...	Running	Henrik	
Henrik's Daily Job 1	June 30, 2022 04:36:3...	Successful	Henrik	<a href="#">Download</a>
MyJob	June 30, 2022 04:31:4...	Failed	geladm	
Update CAS Audit data	June 30, 2022 04:00:0...	Successful	sas.audit	<a href="#">Download</a>

- All jobs use the Job Execution launcher context and run in the default queue (unless another queue is assigned to the context)
- Imparity with LSF Flow Manager flows

# Specifying Execution Windows for Hosts & Queues

- You can also specify start and end times for time-based queue and host parameters

The screenshot displays the 'Workload Orchestrator' interface. The top navigation bar includes 'Dashboard', 'Jobs', 'Queues', 'Hosts', 'Logs', 'Configuration', and 'Log Levels'. The 'Configuration' tab is active, and the 'Queues' section is selected in the left sidebar. A modal window titled 'Edit Configuration Time Override' is open, showing the configuration for a queue named 'AfterHours'. The modal includes a 'Name' field with the value 'AfterHours', an 'Intervals (cron expressions)' section with 'Start' set to '0 18 \*\*\*' and 'End' set to '0 8 \*\*\*', and an '+ Add Interval' button. In the background, the 'Default Time Based Settings' section is highlighted with a red box, showing a priority of 10 and a checked 'Default queue' checkbox.

# Thanks

