Introduction to Programming on Viya

SAS Viya Overview

SAS Viya Programming Process

Use the SAS Code That You Are Familiar with

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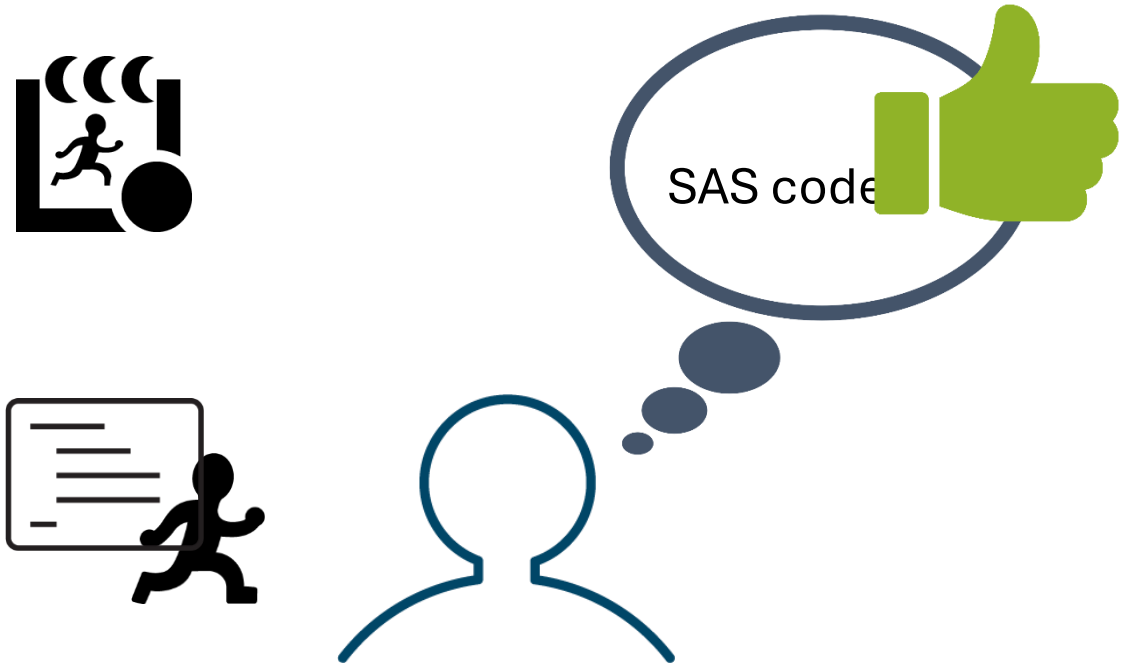
SAS Viya Programming Process

Use the SAS Code That You Are Familiar with



SAS Viya Programming Process

What is discussed in This Presentation

Connect to
SAS Viya

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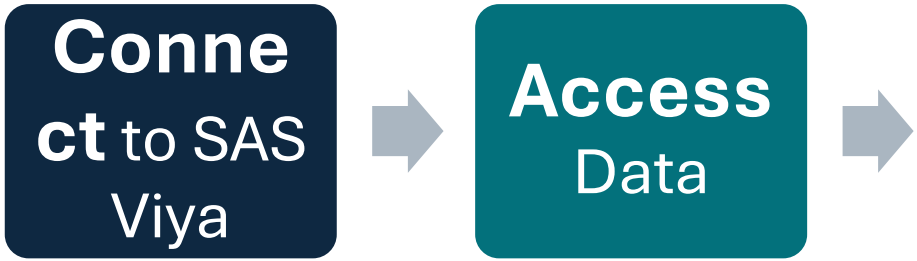
SAS Viya Programming Process

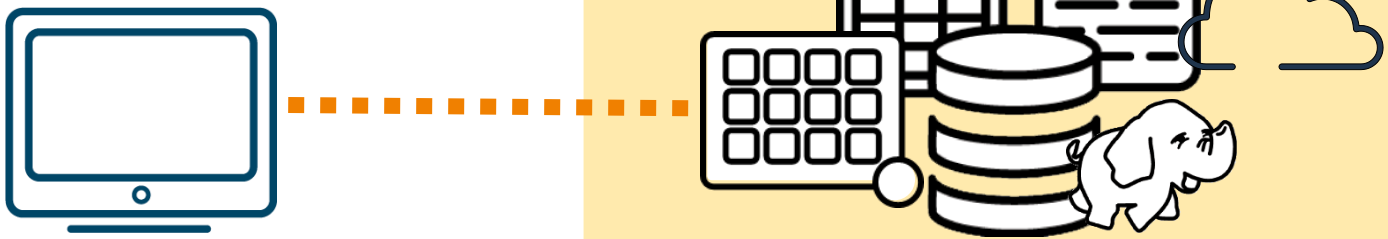
What is discussed in This Presentation



SAS Viya Programming Process

What is discussed in This Presentation

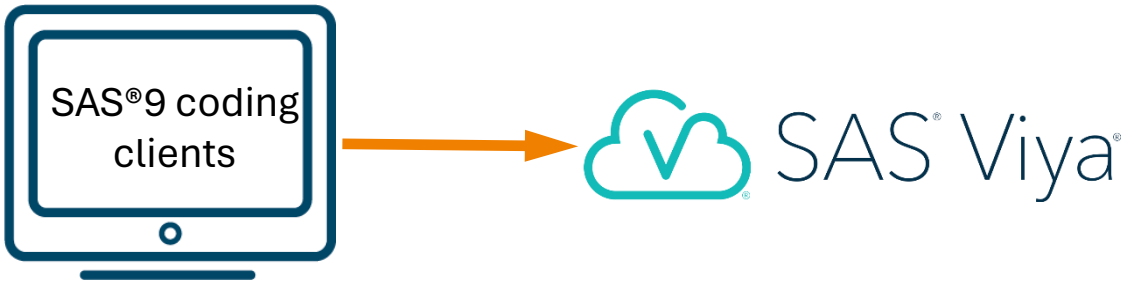
Data Sources That You Can Access with SAS Viya



- on-premises or in the cloud
- relational and unstructured
- XML, JSON, CSV, XLSX...
- SAS data sets and SASHDAT files

Working with SAS Viya

Programming Interfaces



- SAS Studio
- SAS Enterprise Guide
- SAS windowing environment

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Working with SAS Viya

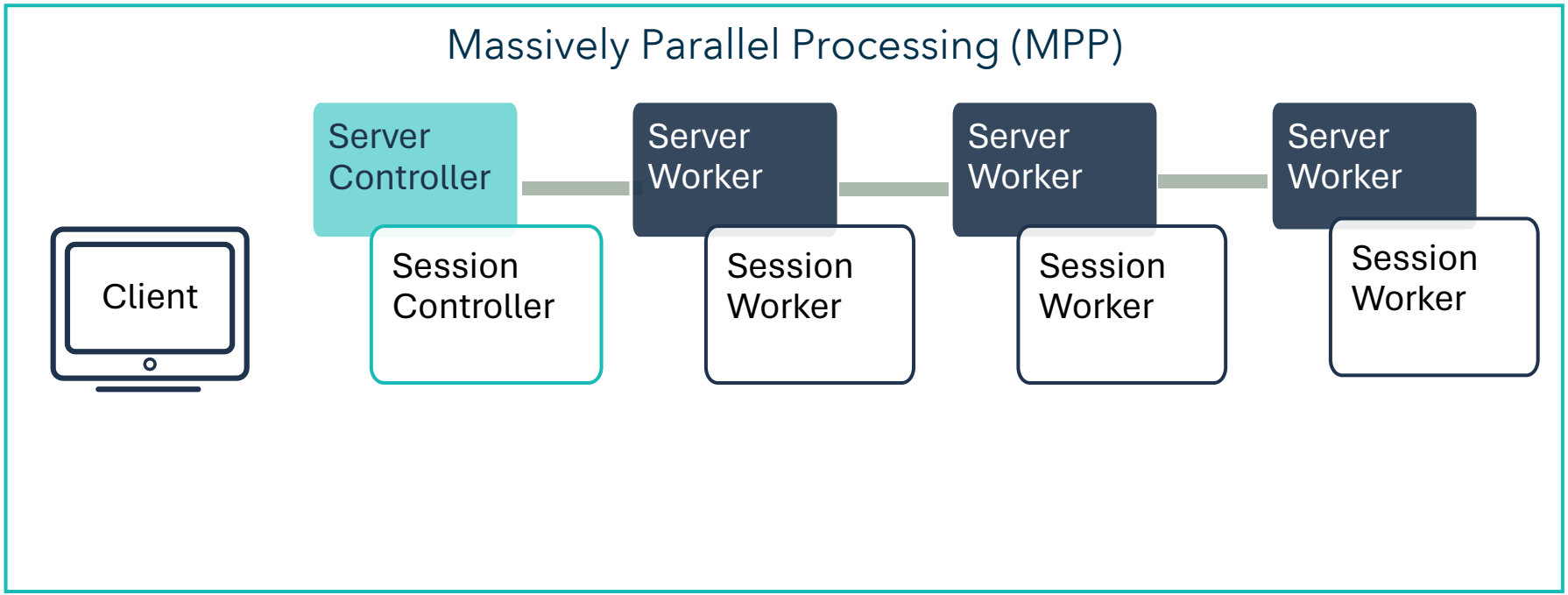
Programming Interfaces

- SAS Studio
- SAS Enterprise Guide
- SAS windowing environment

- R Studio
- Jupyter Notebook

SAS Cloud Analytic Services (CAS)

Configured for Multiple Machines



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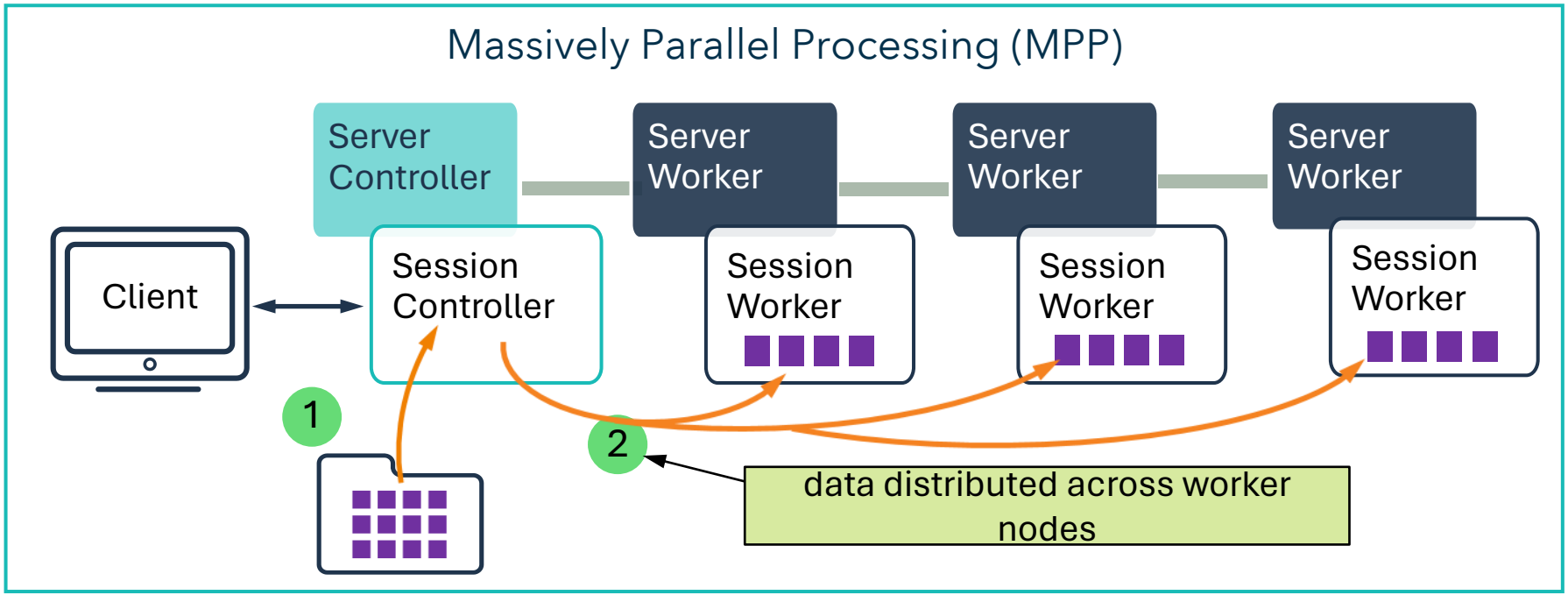
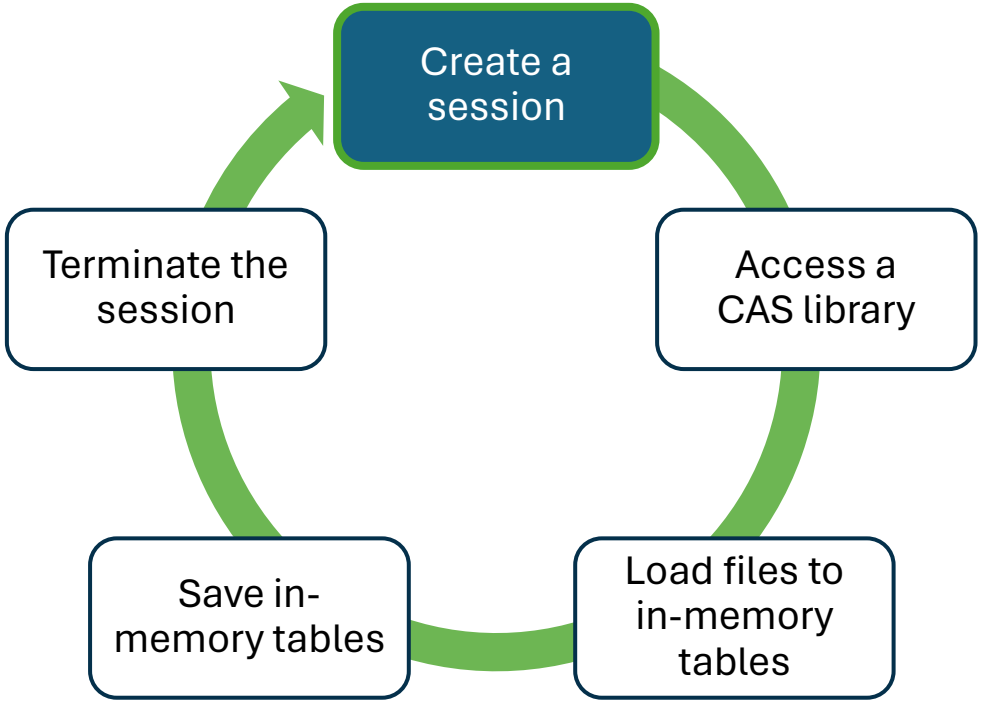
SAS Cloud Analytic Services (CAS)

Configured for Multiple Machines



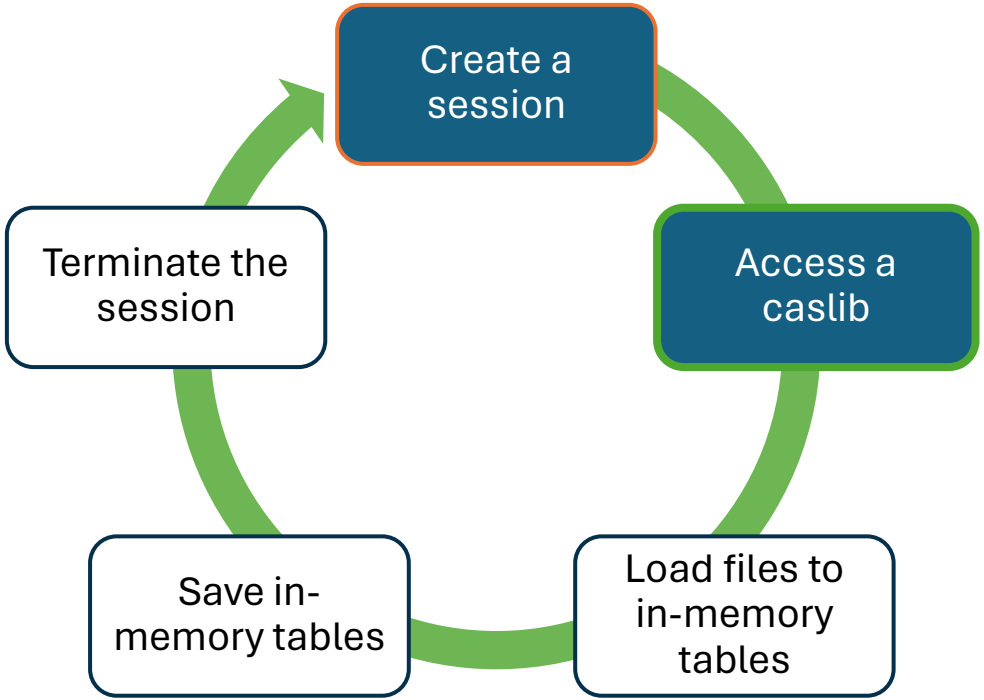
First Step

Create a CAS Session



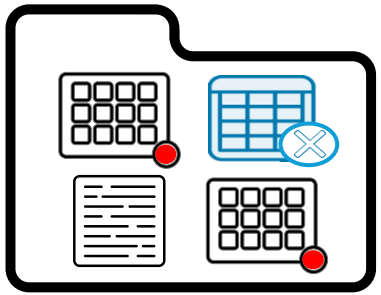
Next Step

Access a Caslib



Working with Libraries

SAS Libraries

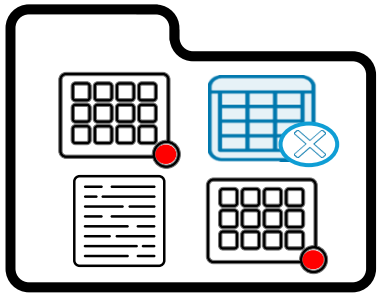


LIBNAME *libref engine* "*path*";

...

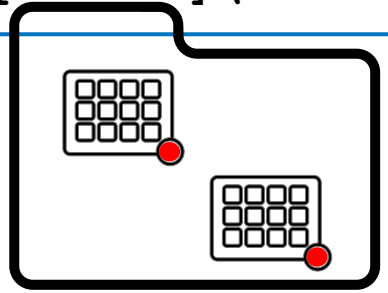
Working with Libraries

SAS Libraries



LIBNAME *libref engine* "*path*";

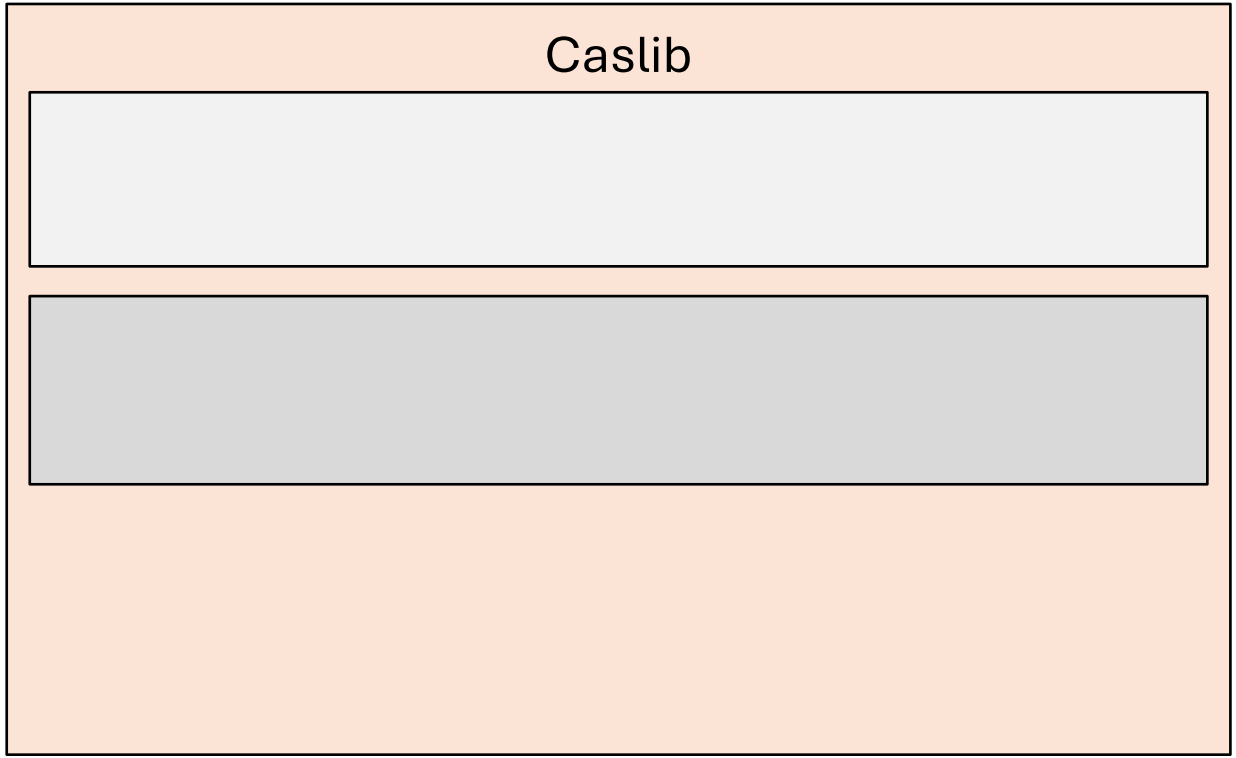
```
libname mysas base
"C:\users\[userID]\Documents\Data34";
```



mysas

Caslibs

Used to Access Data in SAS Viya



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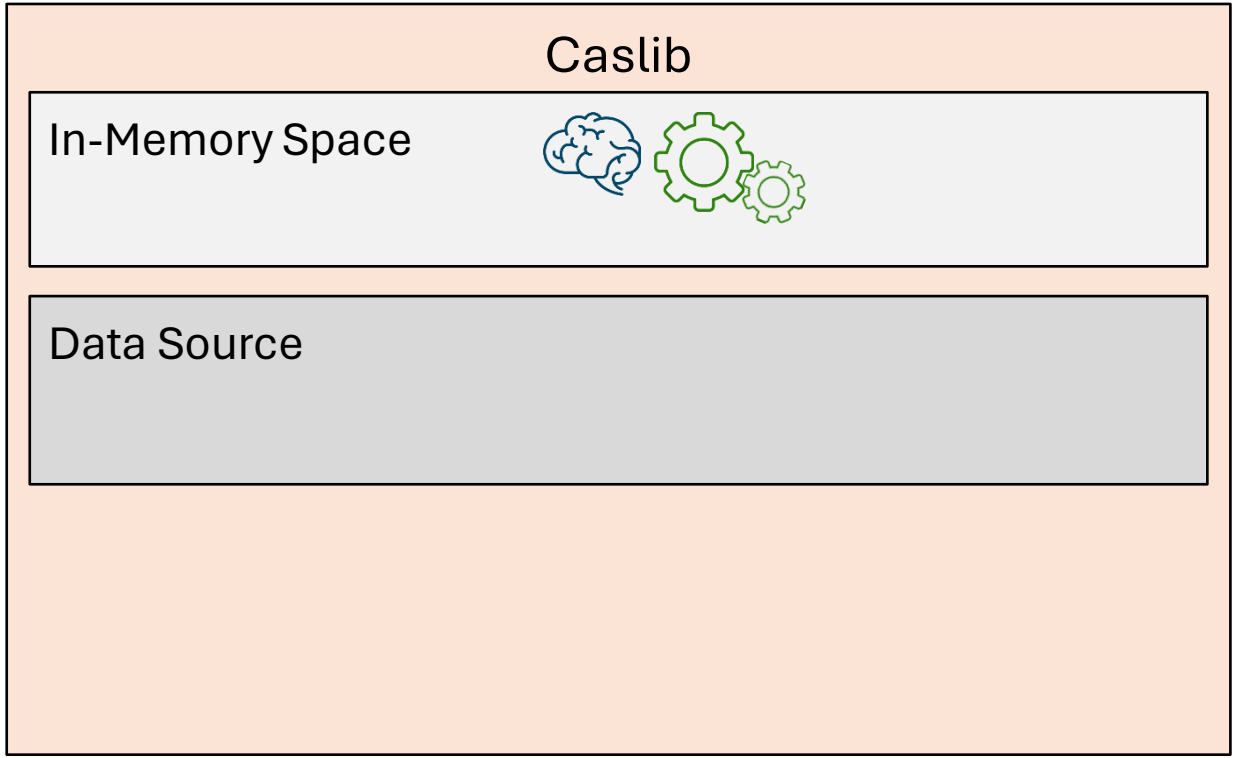
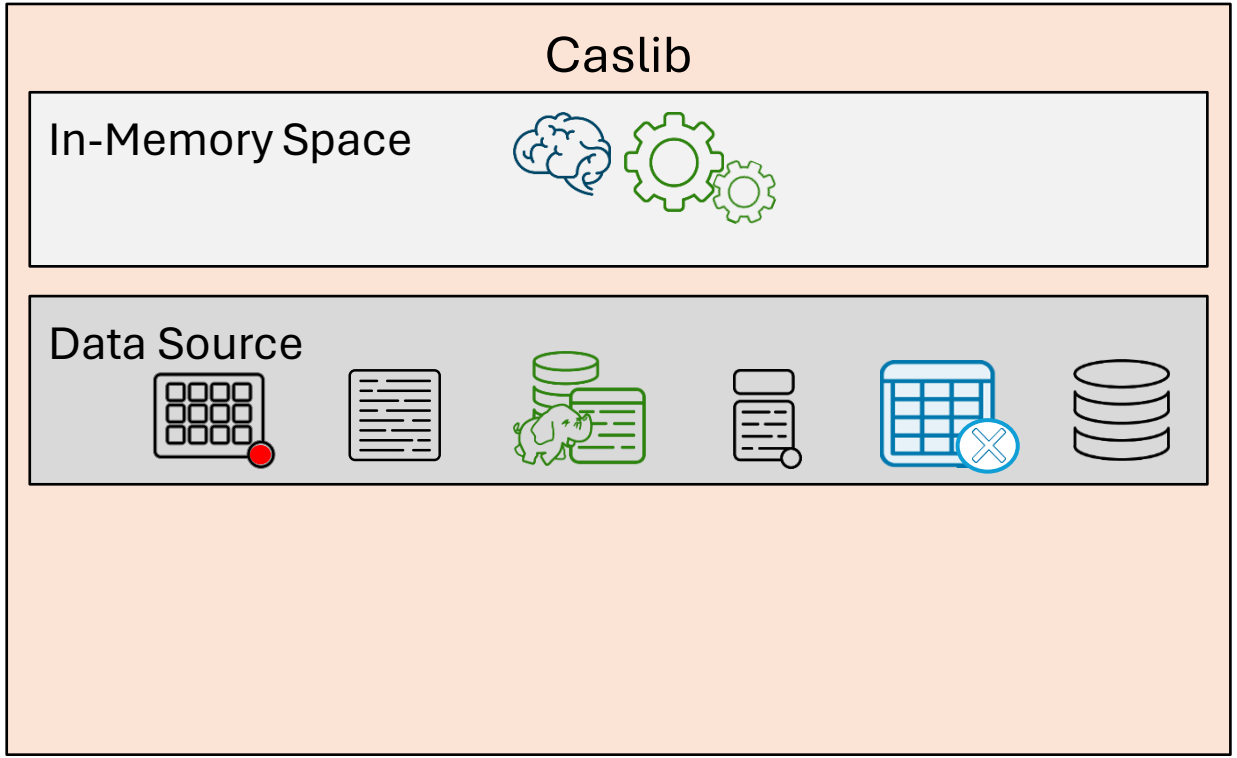


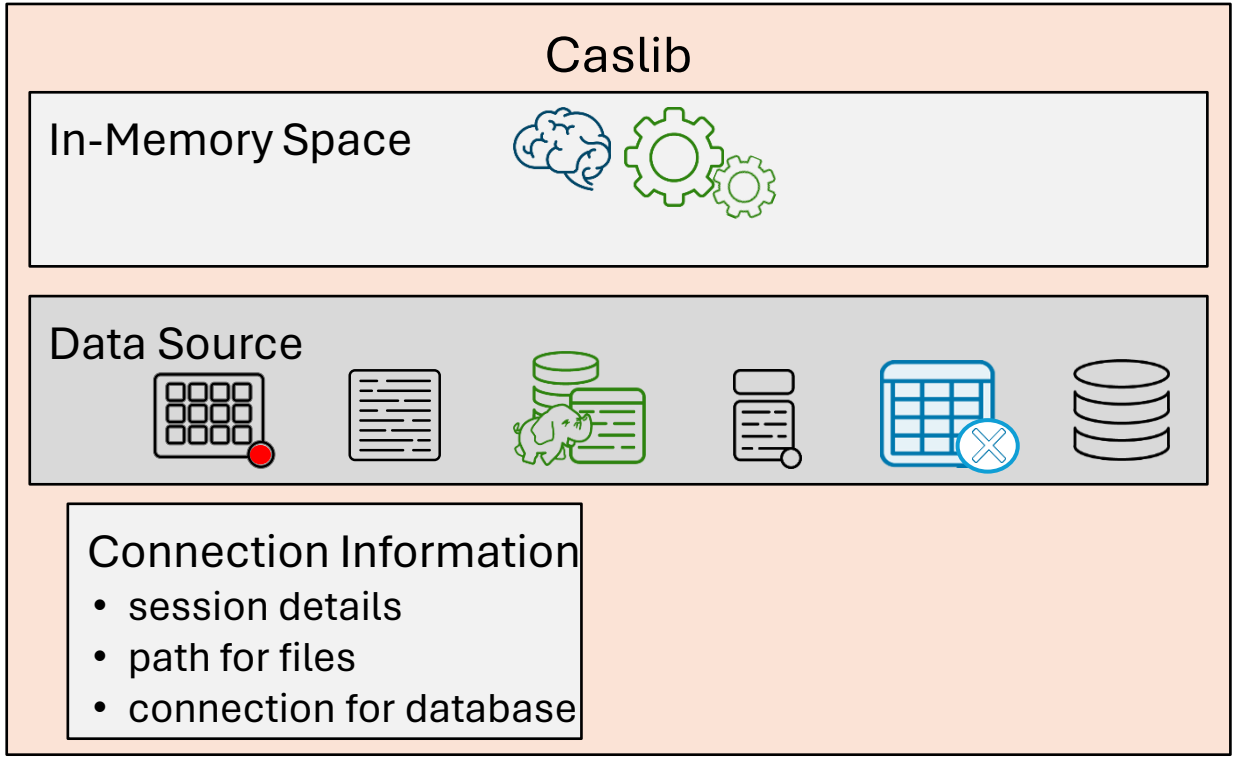
Caslibs

Used to Access Data in SAS Viya



Caslibs

Used to Access Data in SAS Viya



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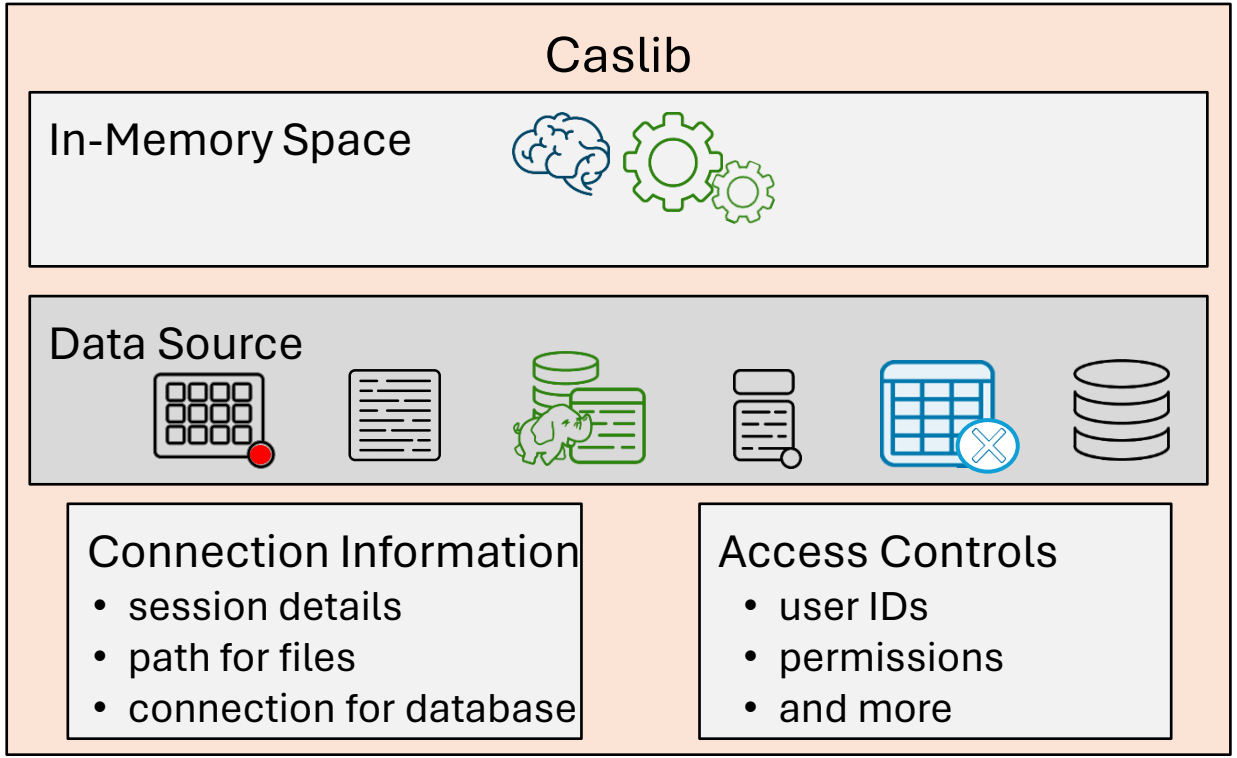
Caslibs

Used to Access Data in SAS Viya



Caslib Scope

Session versus Global

Session Scope

Local=YES

visible to the CAS session where it was created

deleted when the CAS session is terminated

Caslib Scope

Session versus Global

Session Scope

Local=YES

visible to the CAS session where it was created

deleted when the CAS session is terminated

Global Scope

Local=NO

visible across CAS sessions

persists when the CAS session is terminated

Caslib Types

	Personal	Predefined	Manually Added

Caslib Types

	Personal	Predefined	Manually Added
availability	automatically available at the start of each session		
scope	global		
access	only you can access your personal caslib		
typical use	your own personal place to work with data in CAS		

...

Caslib Types

	Personal	Predefined	Manually Added
availability	automatically available at the start of each session	administrator defines and manages	
scope	global	global	
access	only you can access your personal caslib	administrator controls access	
typical use	your own personal place to work with data in CAS	popular shared data sources	

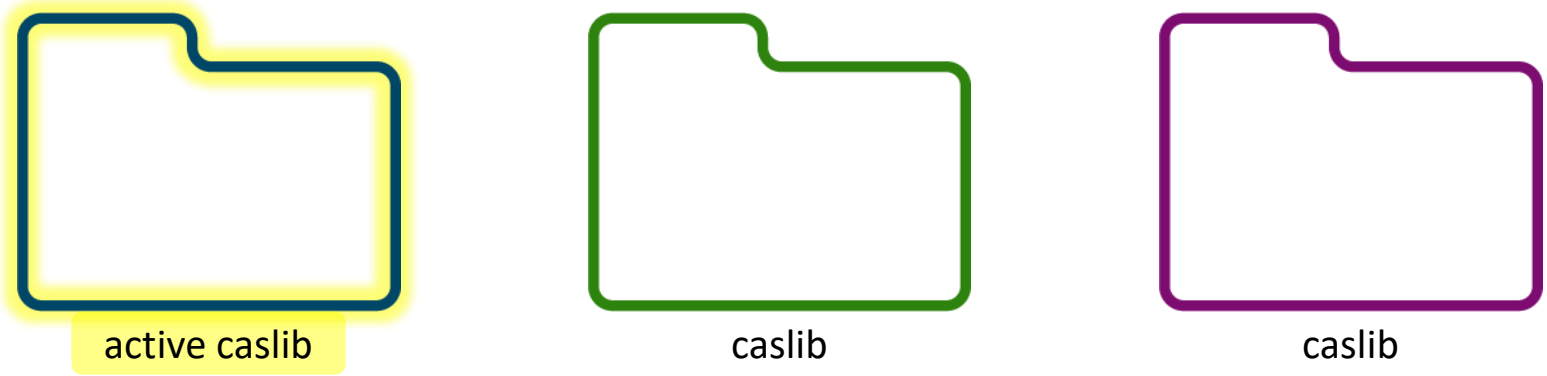
...

Caslib Types

	Personal	Predefined	Manually Added
availability	automatically available at the start of each session	administrator defines and manages	added by administrators and authorized users only
scope	global	global	session or global
access	only you can access your personal caslib	administrator controls access	administrator controls access
typical use	your own personal place to work with data in CAS	popular shared data sources	ad hoc data access

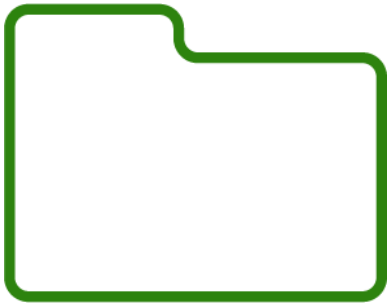
Active Caslib

Only One Caslib Is Active



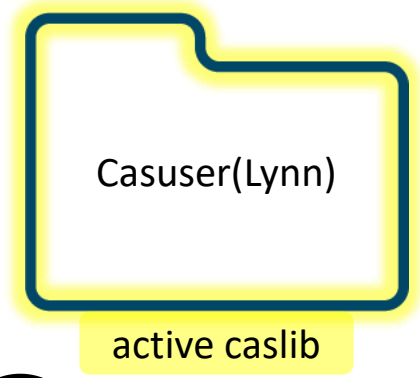
Active Caslib

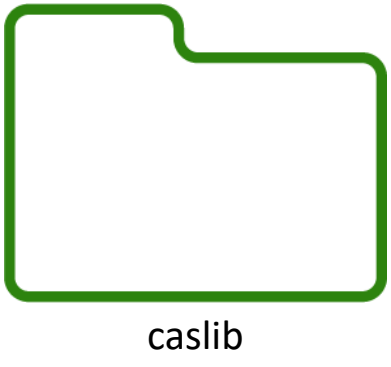
Default Location Where Data Is Processed

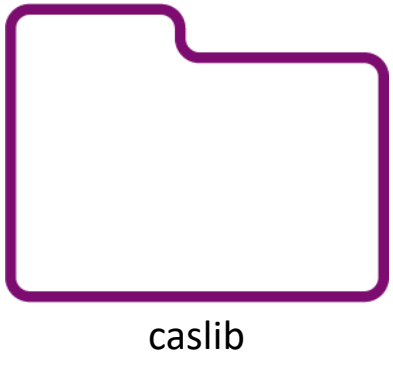


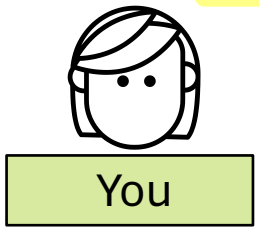
Active Caslib

Personal Caslib Is Active at Start of Session





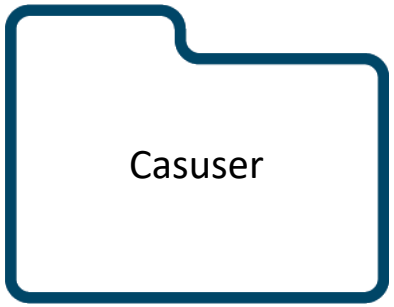




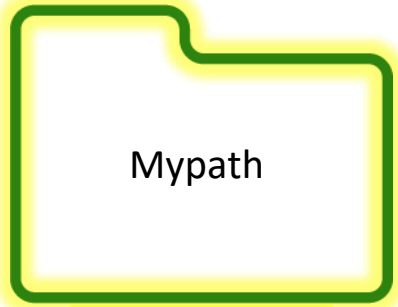
Start the CAS session.

Active Caslib

Ways to Change the Active Caslib



caslib



active caslib

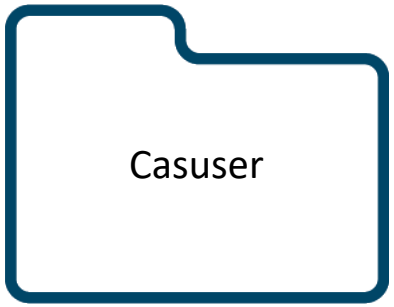
caslib

You

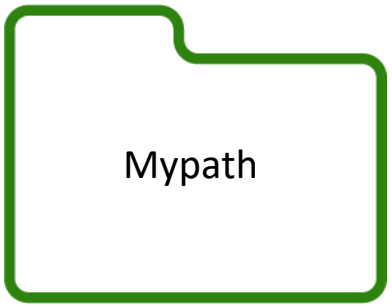
Define a new caslib with the CASLIB statement.

Active Caslib

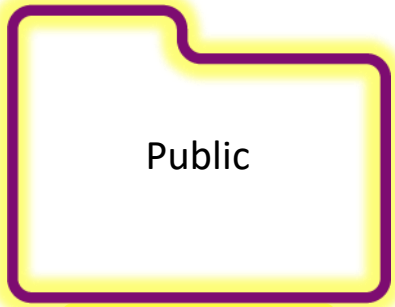
Ways to Change the Active Caslib



caslib



caslib



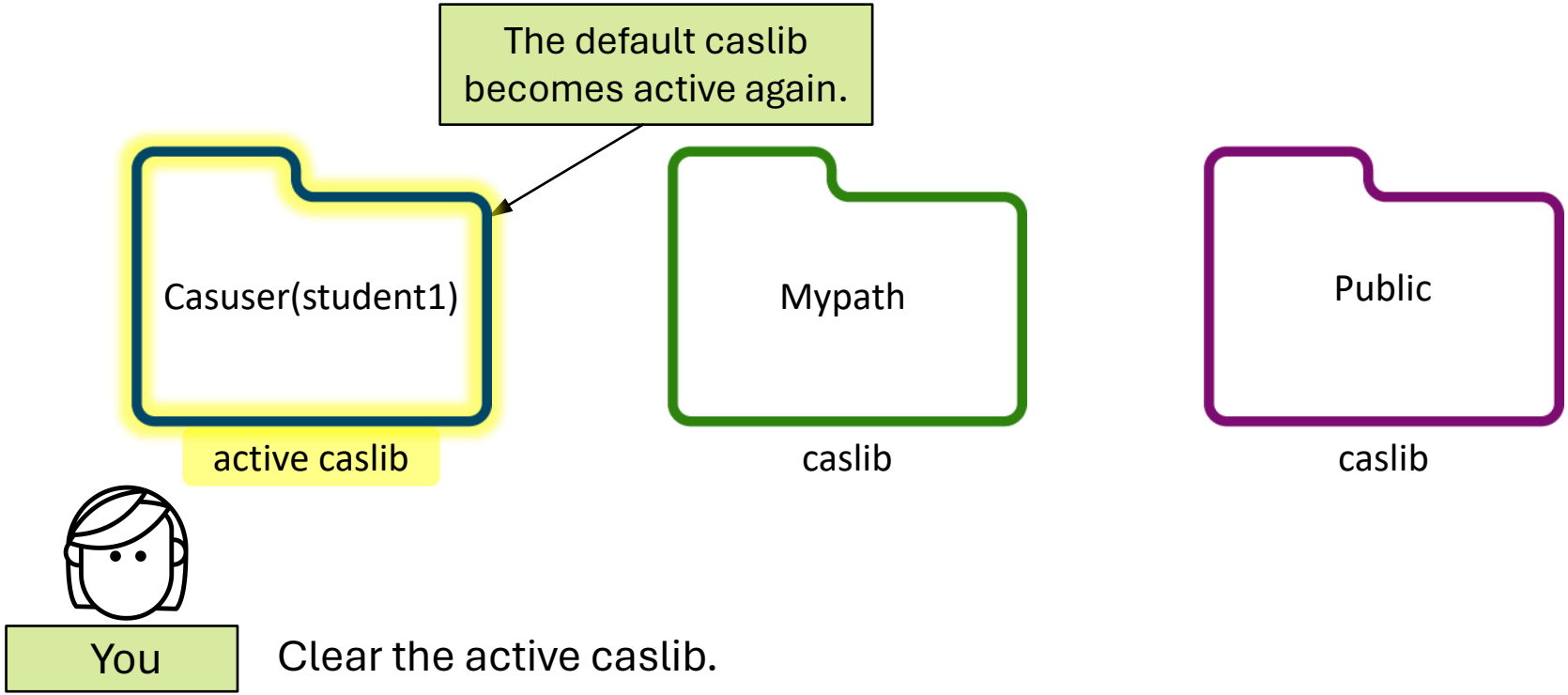
active caslib

You

Change the CASLIB= option in the CAS statement.

Active Caslib

Ways to Change the Active Caslib



Multiple Choice Question

- What happens to a session-scope caslib when the CAS session ends?

a. The session-scope caslib is visible the next time the CAS session starts.
b. The session-scope caslib is not available the next time the CAS session starts.
c. It ceases to exist.

Multiple Choice Question – Correct Answer

- What happens to a session-scope caslib when the CAS session ends?

a. The session-scope caslib is visible the next time the CAS session starts.
b. The session-scope caslib is not available the next time the CAS session starts.
c. Everyone can access the caslib the next time the CAS session starts.

- **Session-scope caslibs are visible only to the user who creates them, and they are deleted when the CAS session ends.**

Multiple Choice Question

- What is the value of Local= if the caslib is a session-scope caslib?

a. Local=No
b. Local=Yes

1.08 Multiple Choice Question – Correct Answer

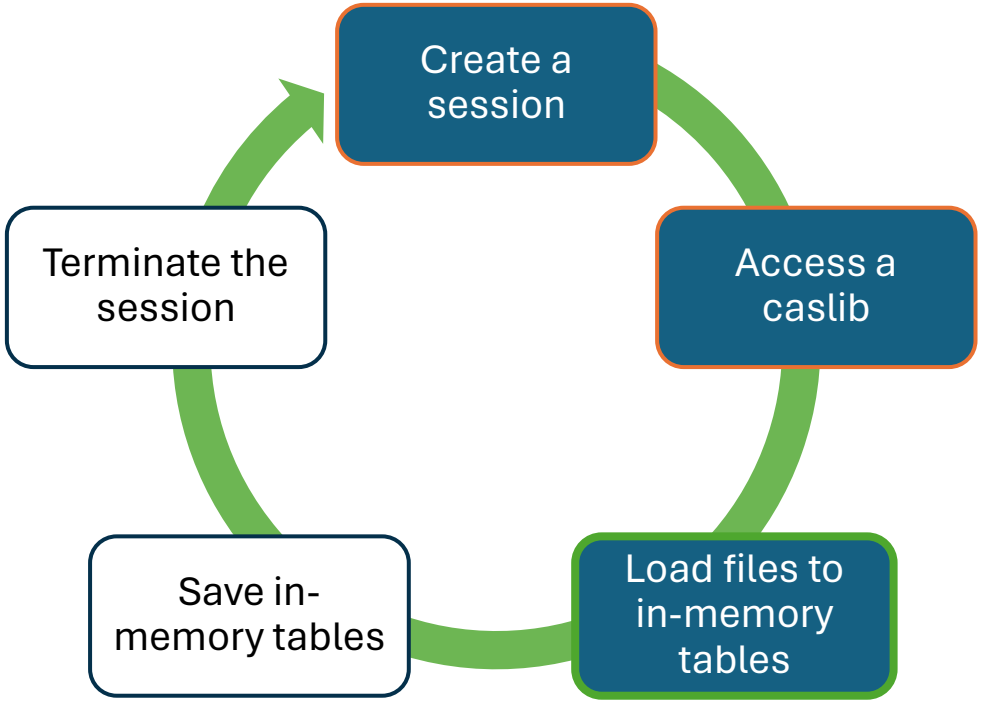
- What is the value of Local= if the caslib is a session-scope caslib? Y

a. Local=No
b. Local=Yes

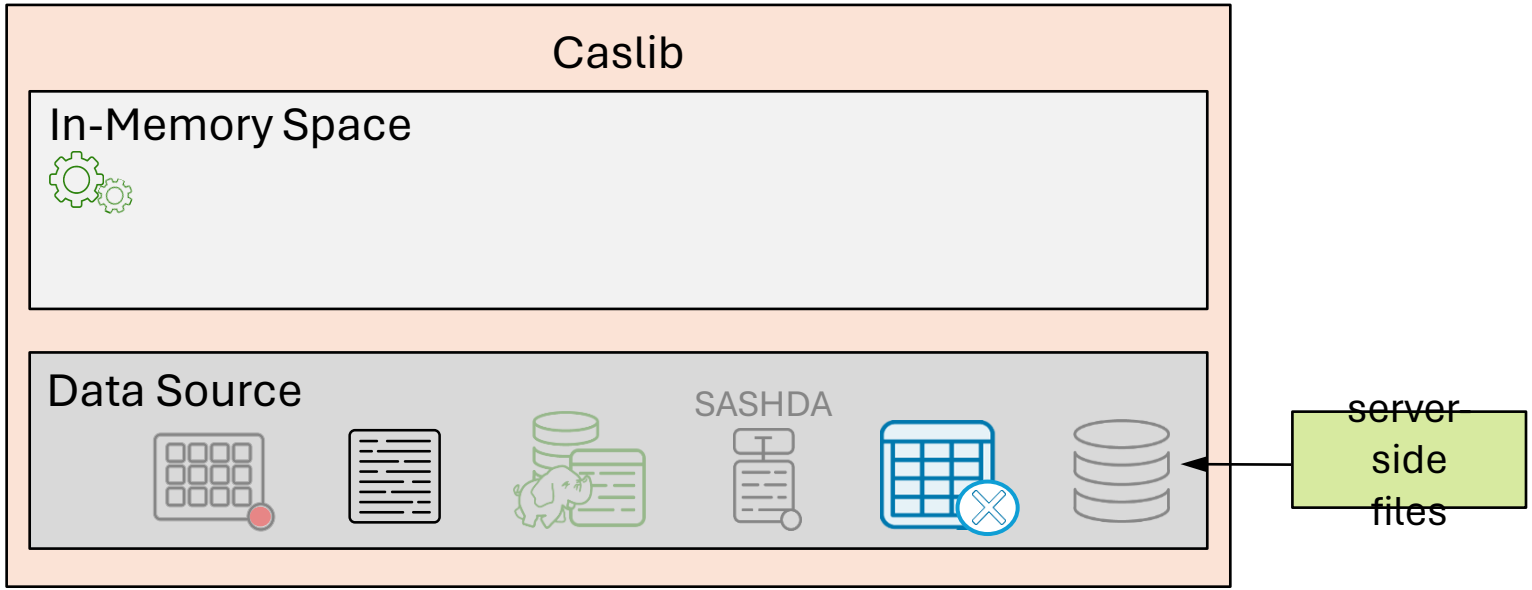
```
NOTE: Session = MYSESSION Name = MYPATH
Type = PATH
Description =
Path = /workshop/pgvy34/
Definition =
Subdirs = No
Local = Yes
Active = Yes
Personal = No
```

Next Step

Load Files to In-Memory Tables



Load Files to In-Memory Tables



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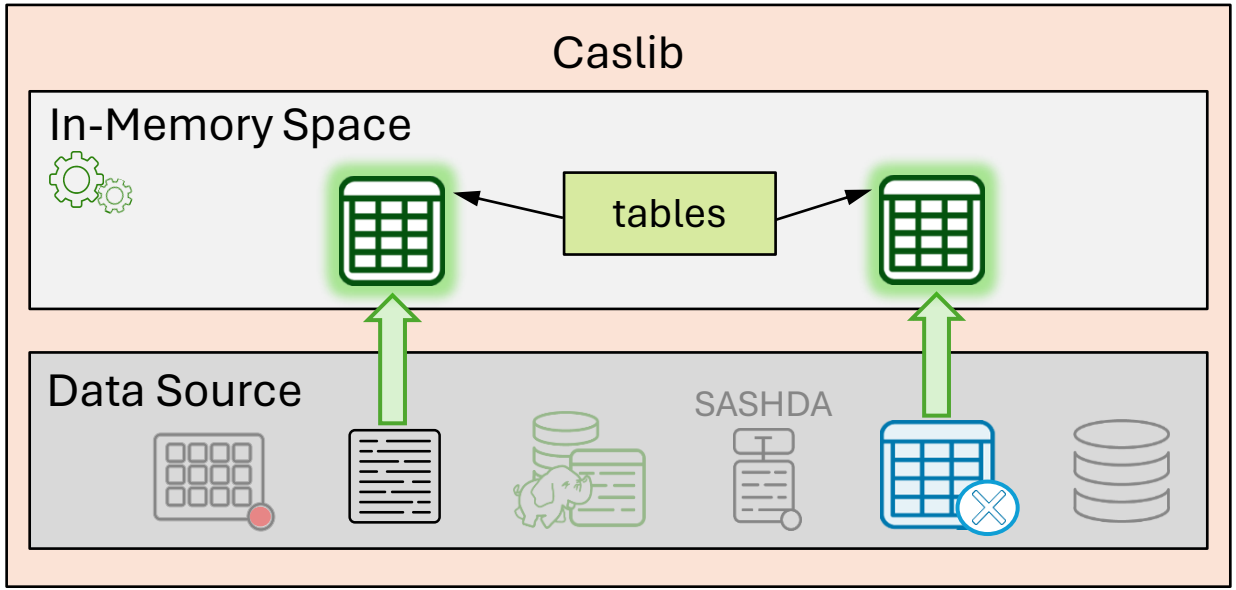
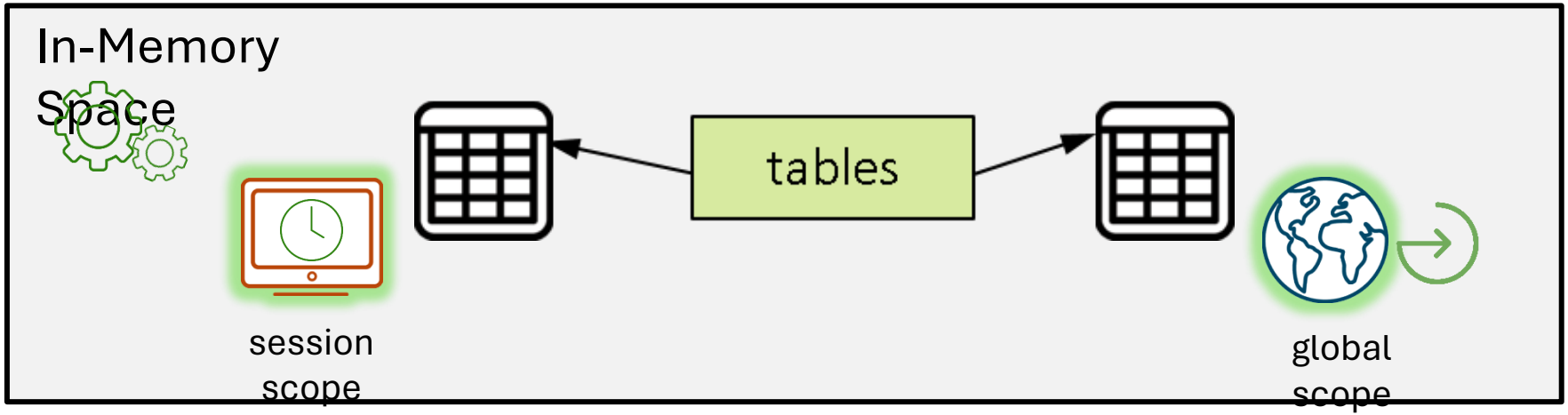
Load Files to In-Memory Tables



Load Files to In-Memory Tables



In-Memory Table Scope

Session versus Global

Session Scope

default → **Promote=NO**

visible only to the CAS session where it was created

visible only to the user who created the table

dropped from memory upon termination of CAS

...

In-Memory Table Scope

Session versus Global

Session Scope

default → **Promote=NO**

visible only to the CAS session where it was created

visible only to the user who created the table

dropped from memory upon termination of CAS

...

In-Memory Table Scope

Session versus Global

Session Scope

default → **Promote=NO**

- visible only to the CAS session where it was created
- visible only to the user who created the table
- dropped from memory upon termination of CAS

Global Scope

promoted table → **Promote=YES**

- visible across CAS sessions
- visible to any user who can access the global-scope caslib
- *not* dropped from memory upon termination of CAS

Question

- Session-scope tables are only for you in your own CAS session and are dropped from memory when your CAS session is terminated.

- ❍ True
- ❍ False

Question – Correct Answer

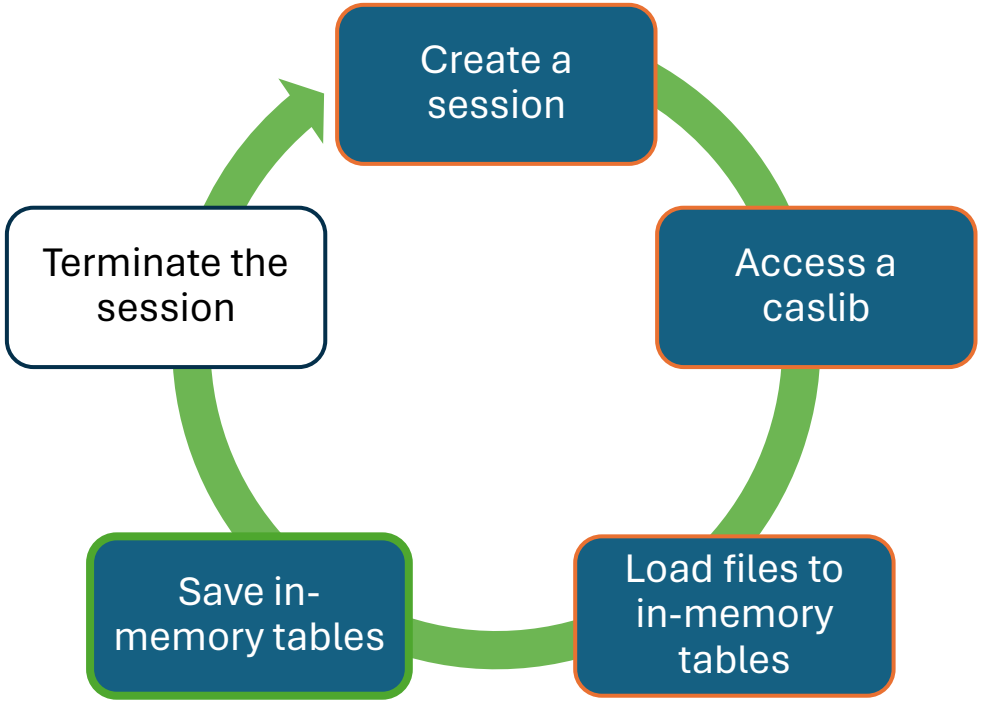
- Session-scope tables are only for you in your own CAS session and are dropped from memory when your CAS session is terminated.

- ◉ True
- ○ False

- **Session-scope tables cannot be shared with other users and are dropped from memory when your CAS session ends. Global-scope tables are visible to multiple users and CAS sessions, provided that you promote them to a caslib that is shared by other users. Global-scope tables persist in memory.**

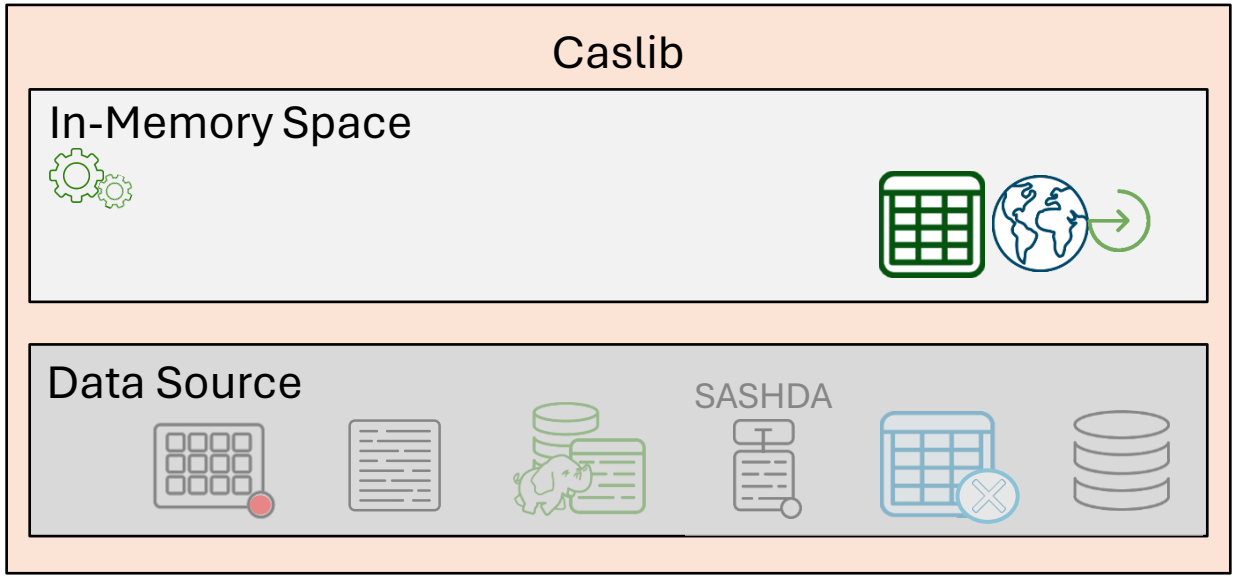
Next Step

Save In-Memory Tables



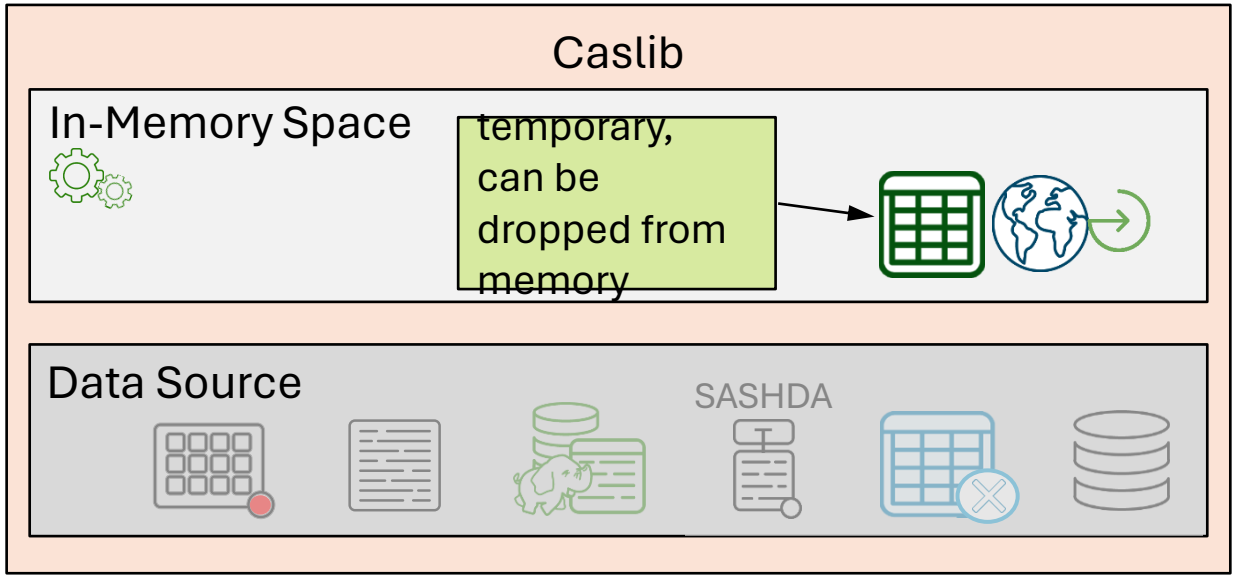
Save In-Memory Tables

Save to the Data Source as SASHDAT Files



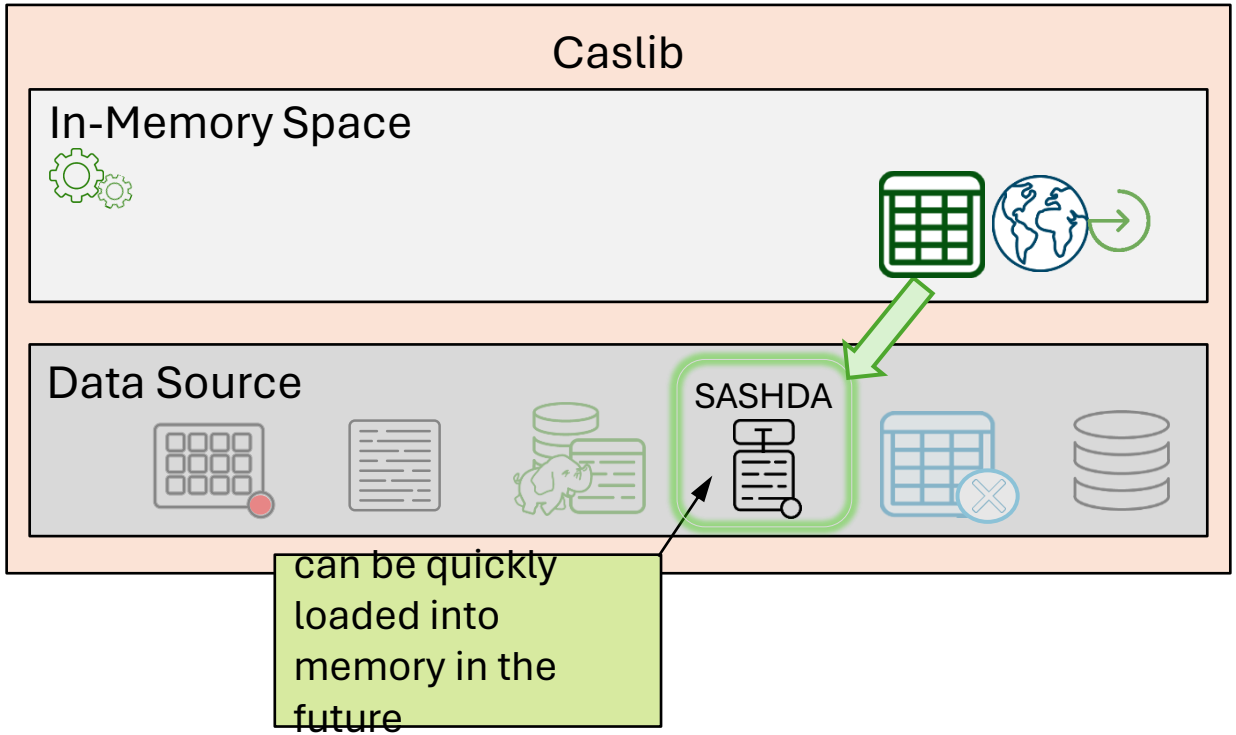
Save In-Memory Tables

Save to the Data Source as SASHDAT Files



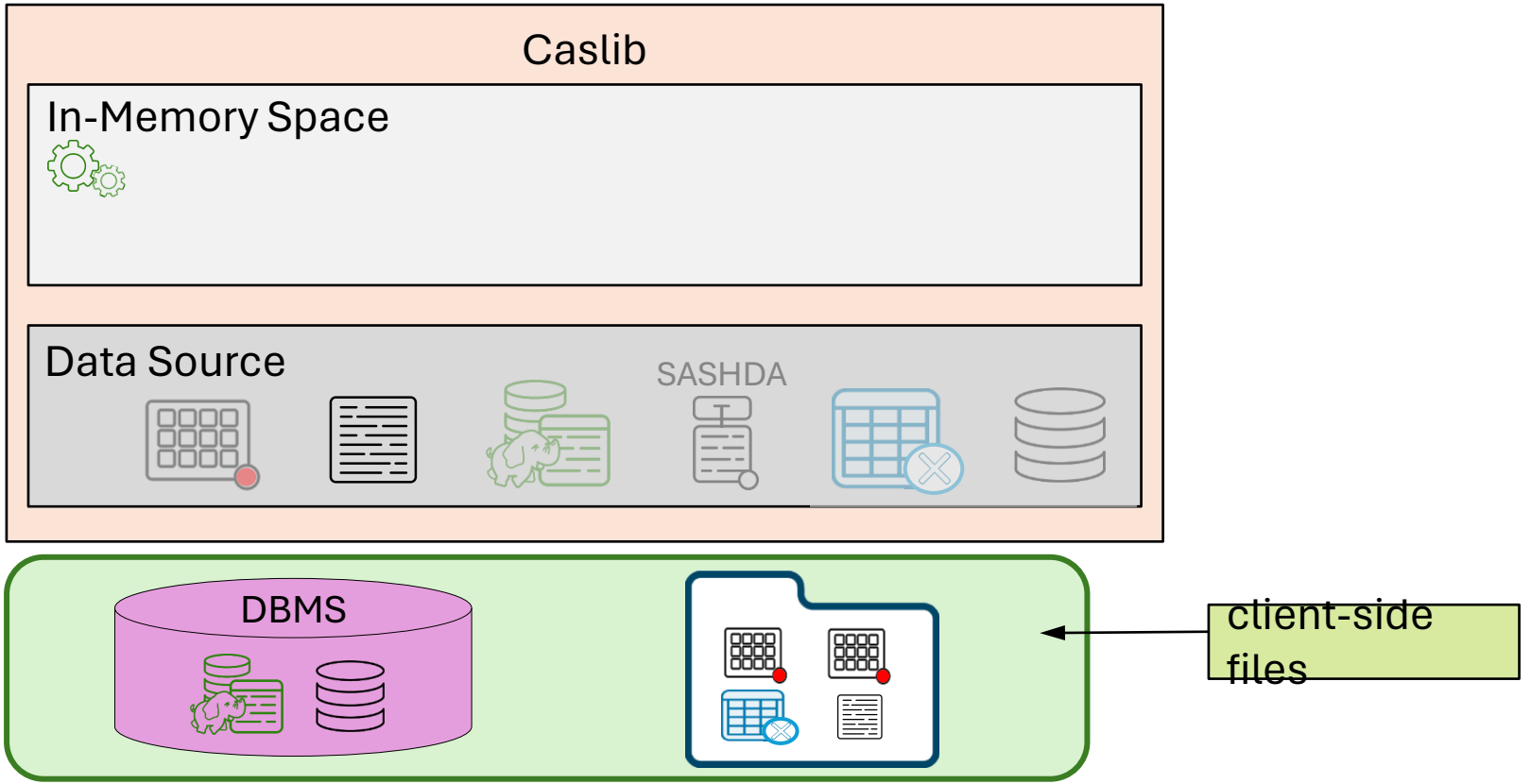
Save In-Memory Tables

Save to the Data Source as SASHDAT Files



Loading Data into Memory in CAS

Client-Side Files



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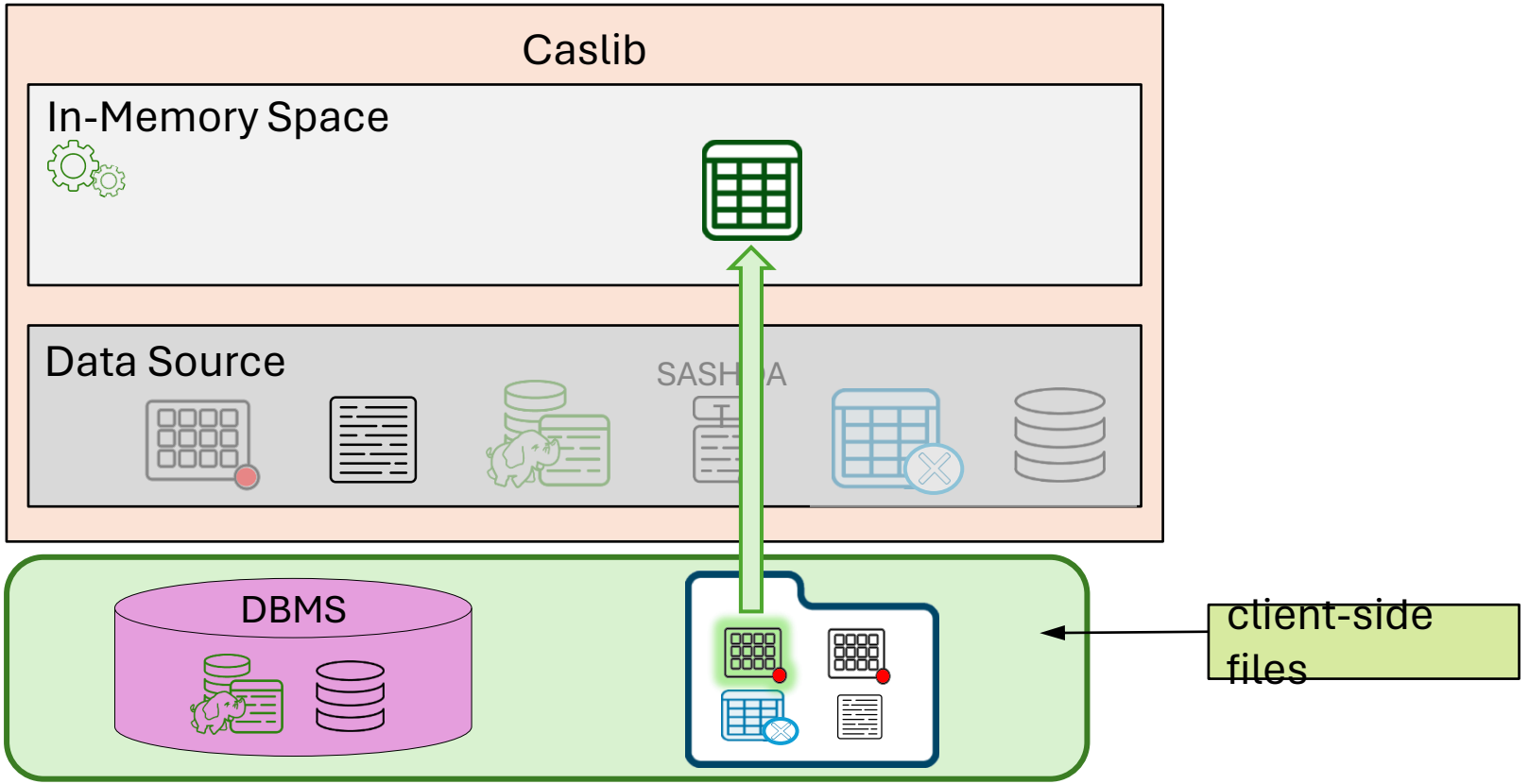
Loading Data into Memory in CAS

Client-Side Files



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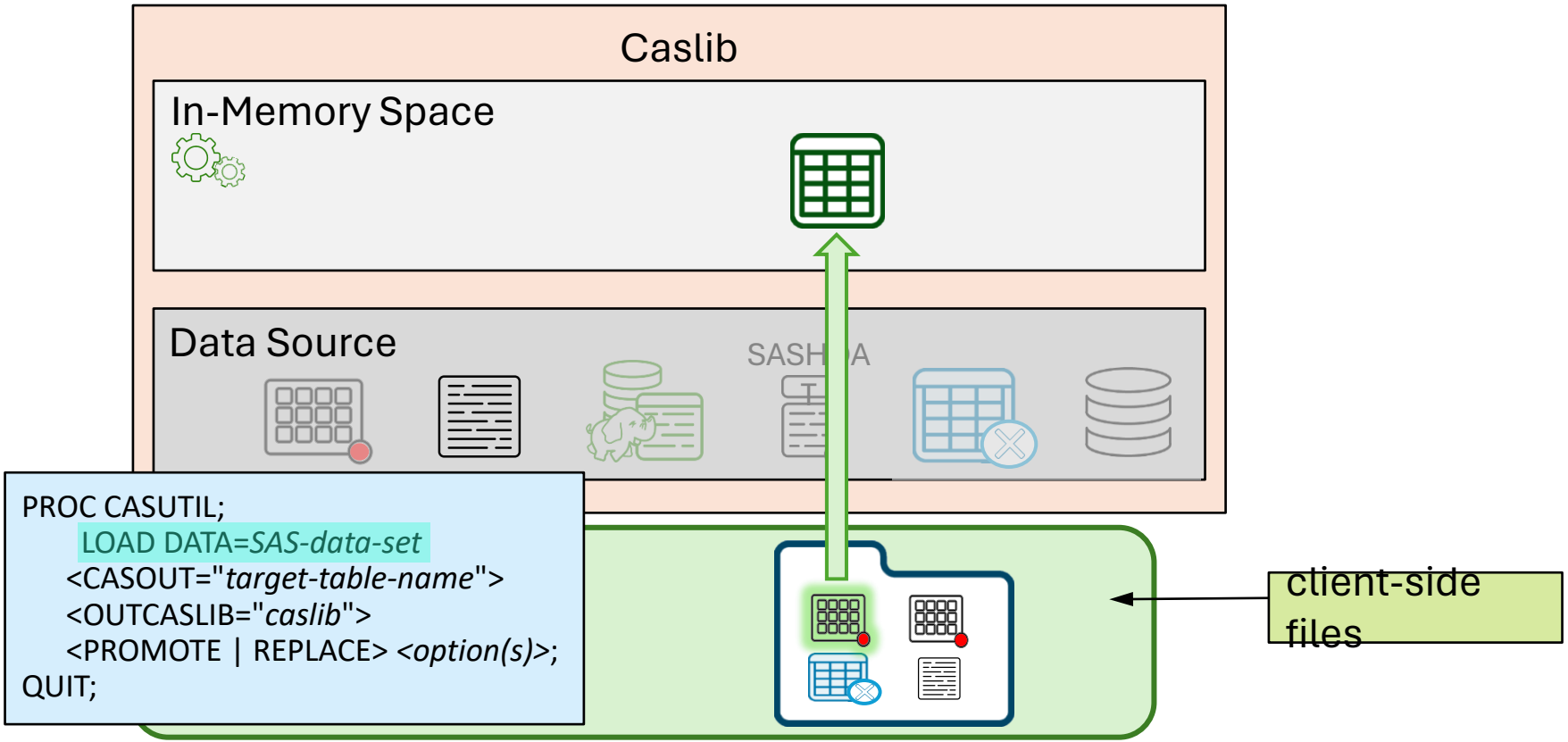
Loading Data into Memory in CAS

Client-Side Files

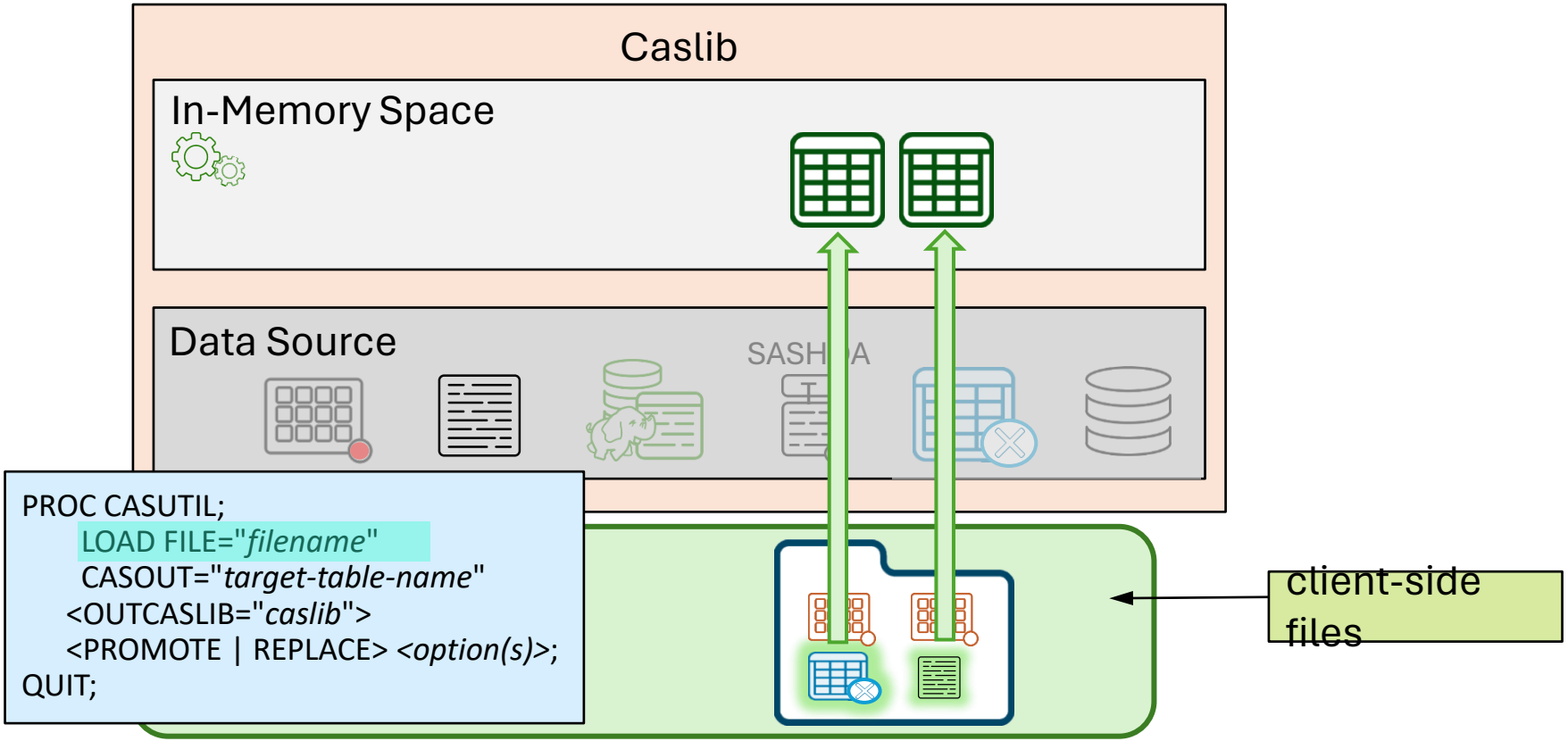



```
PROC CASUTIL;
     LOAD DATA=SAS-data-set
    <CASOUT="target-table-name">
    <OUTCASLIB="caslib">
    <PROMOTE | REPLACE> <option(s)>;
QUIT;
```

...

Loading Data into Memory in CAS

Client-Side Files

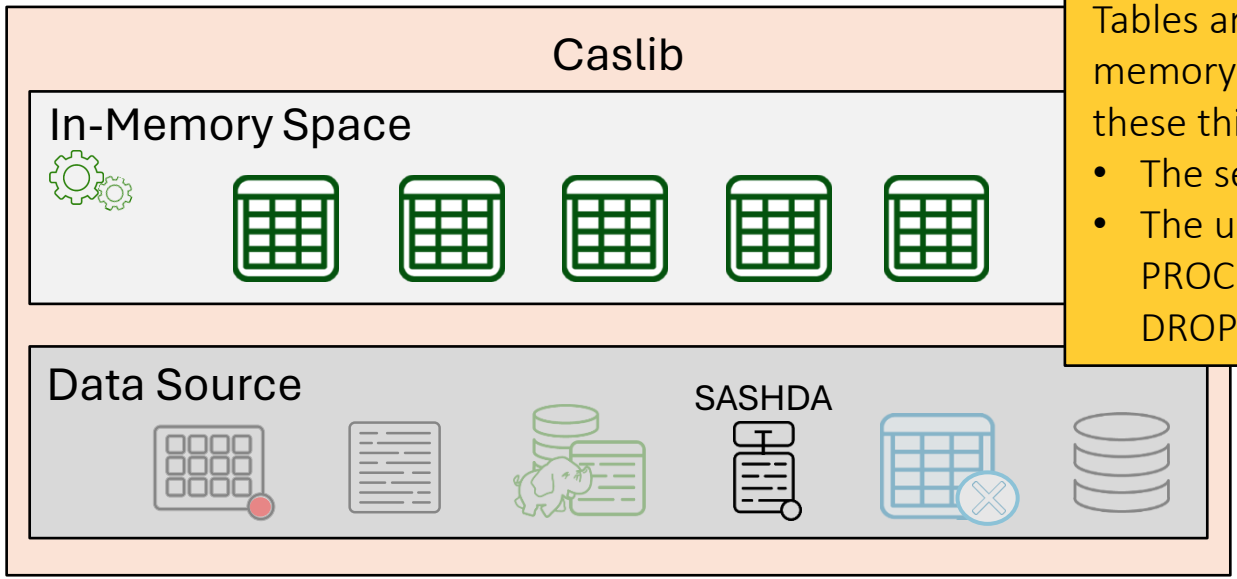



```
PROC CASUTIL;
      LOAD FILE="filename"
       CASOUT="target-table-name"
    <OUTCASLIB="caslib">
    <PROMOTE | REPLACE> <option(s)>;
QUIT;
```

...

Saving In-Memory Tables

Save to Data Source as SASHDAT Files

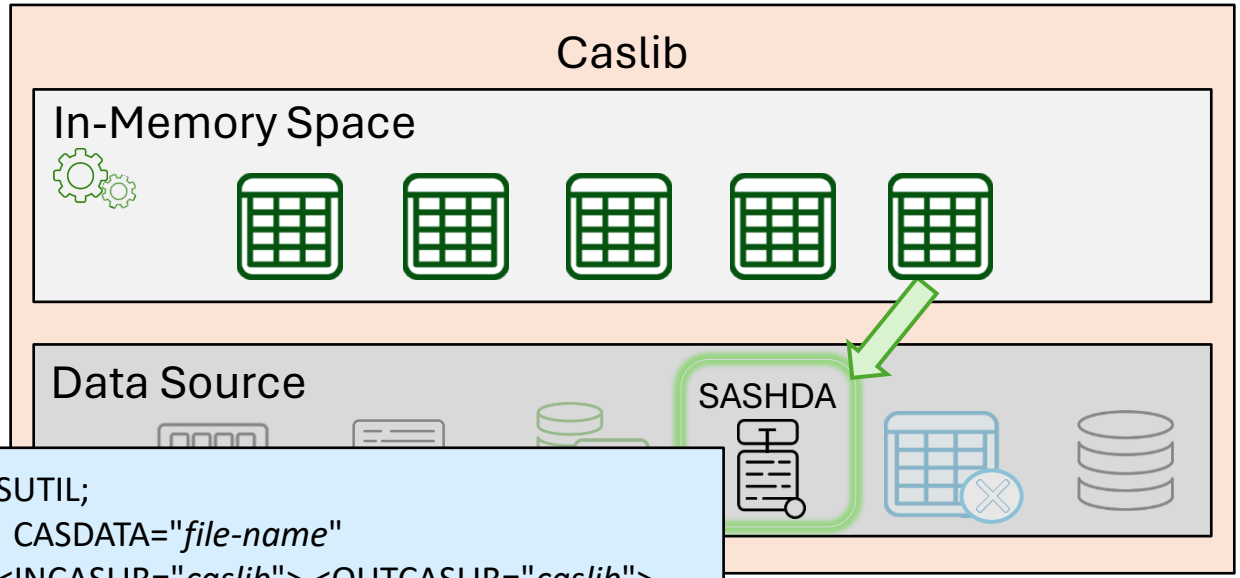


Tables are dropped from memory when one of these things occurs:

- The server is restarted.
- The user submits a PROC CASUTIL DROPTABLE statement.

Saving In-Memory Tables

Save to Data Source as SASHDAT Files

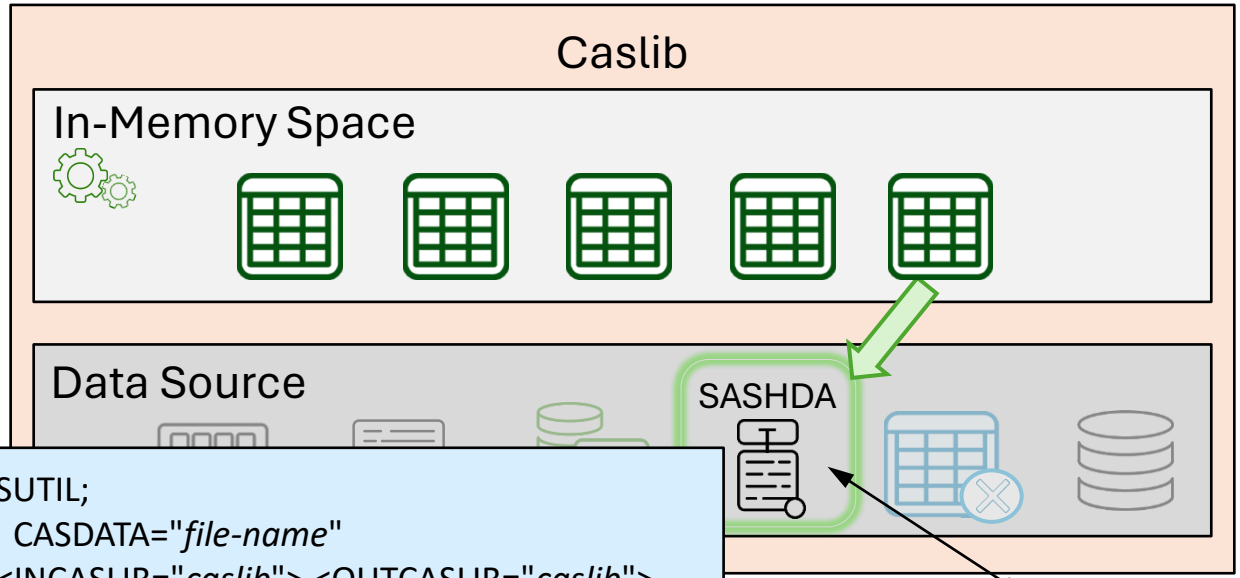



```
PROC CASUTIL;
      SAVE  CASDATA="file-name"
            <INCASLIB="caslib"> <OUTCASLIB="caslib">
            <CASOUT="target-table-name" <option(s)>;
QUIT;
```

...

Saving In-Memory Tables

Save to Data Source as SASHDAT Files

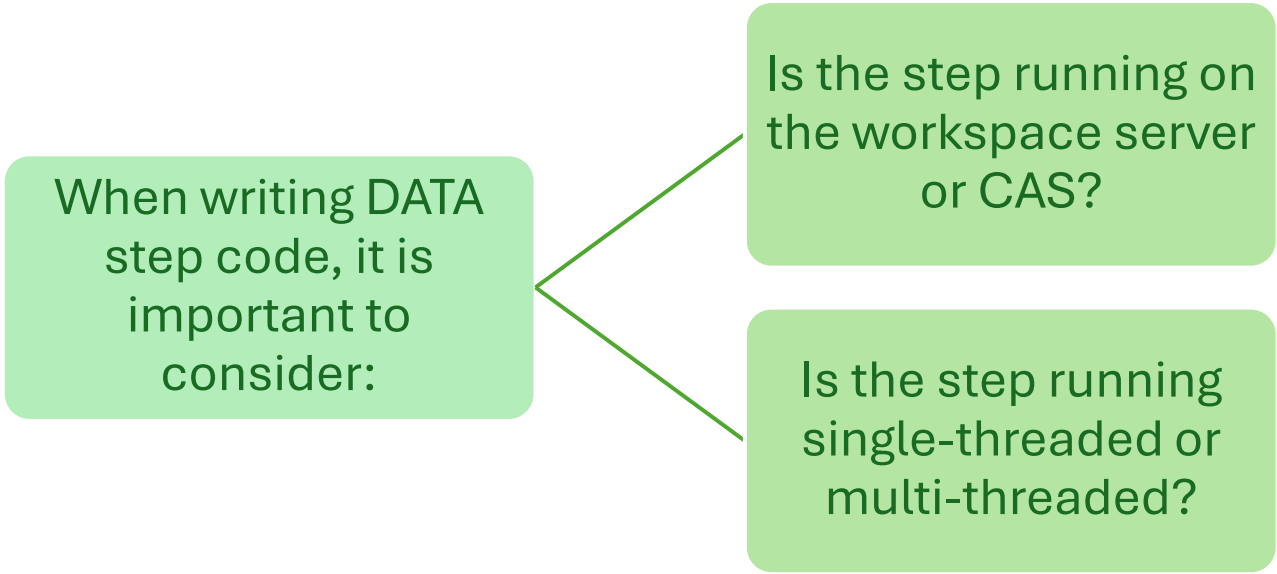



```
PROC CASUTIL;
      SAVE  CASDATA="file-name"
            <INCASLIB="caslib"> <OUTCASLIB="caslib">
            <CASOUT="target-table-name" <option(s)>;
QUIT;
```

can be quickly loaded into memory by reading the header

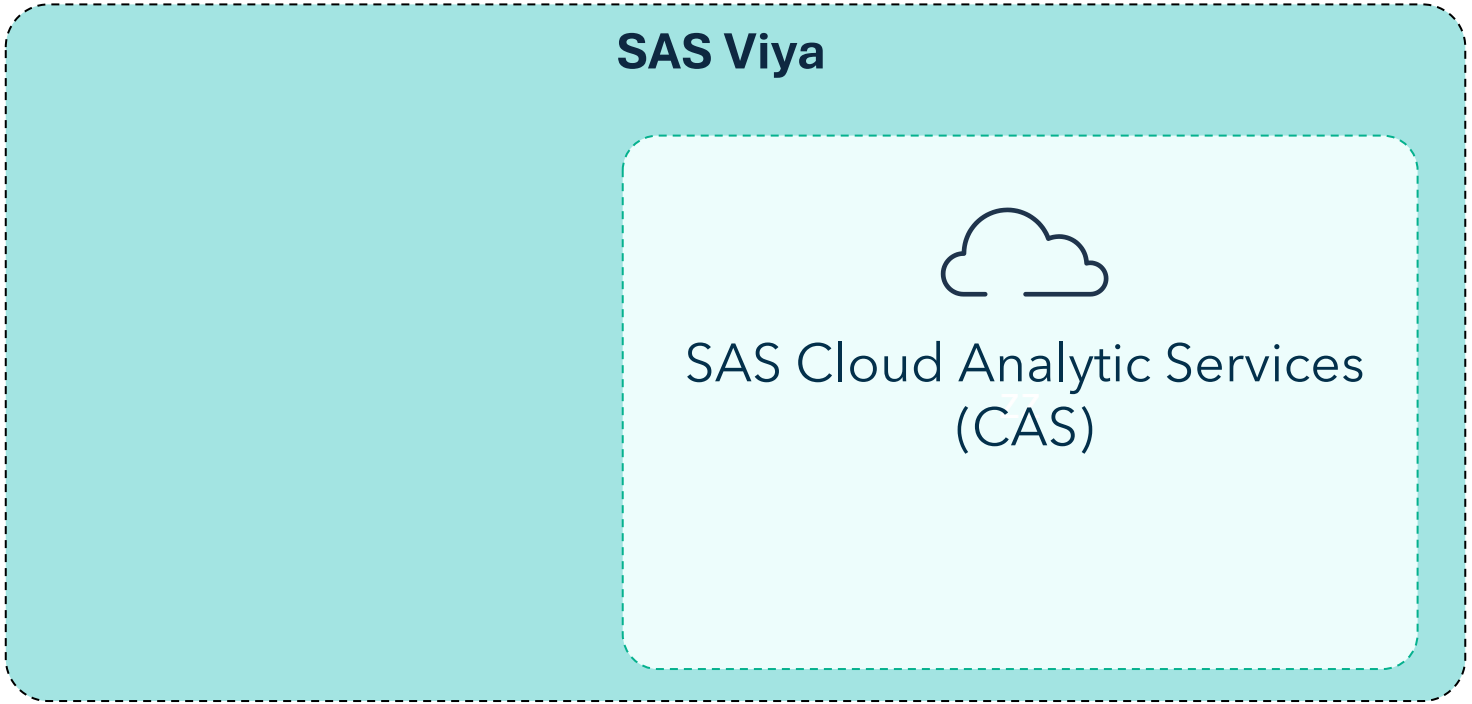
SAS DATA Step Processing

Where and How Is It Processing?



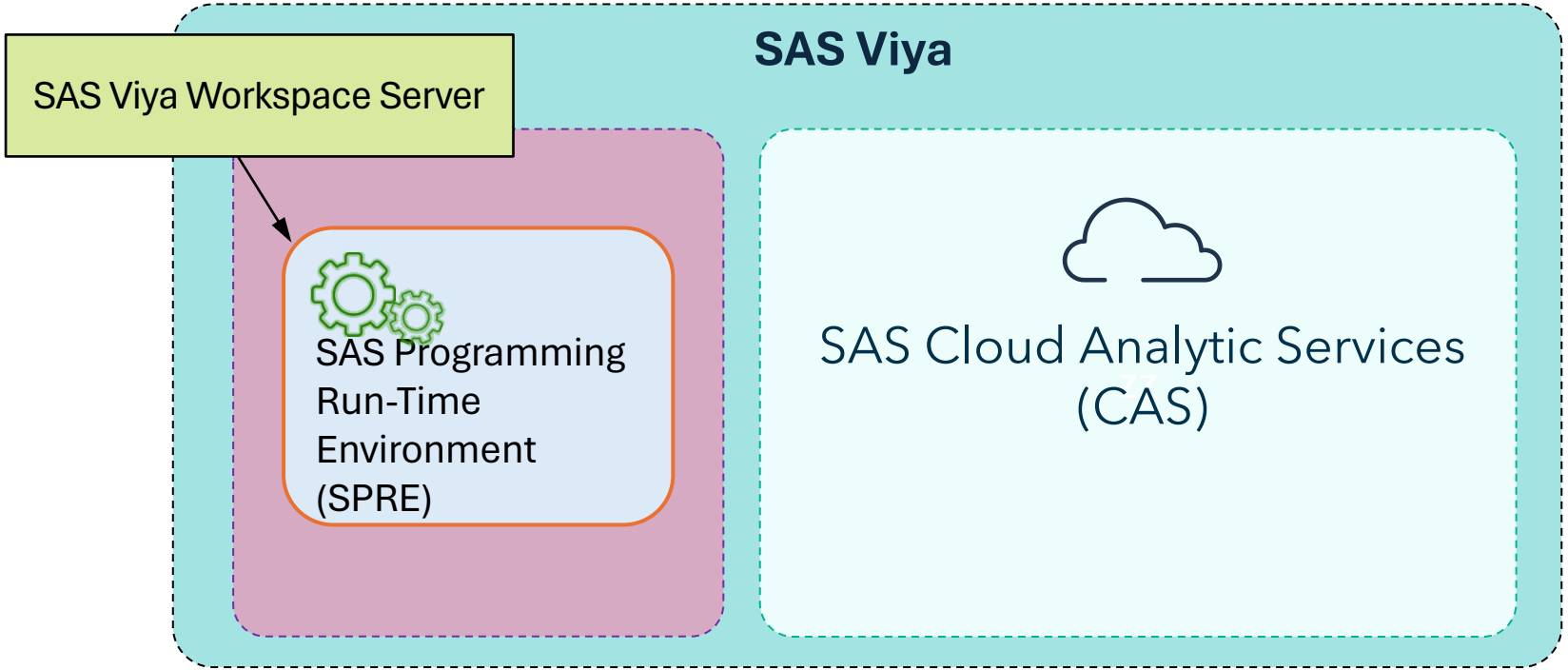
SAS DATA Step Processing

With SINGLE=YES Data Set Option



SAS DATA Step Processing

SAS Programming Run-Time Environment



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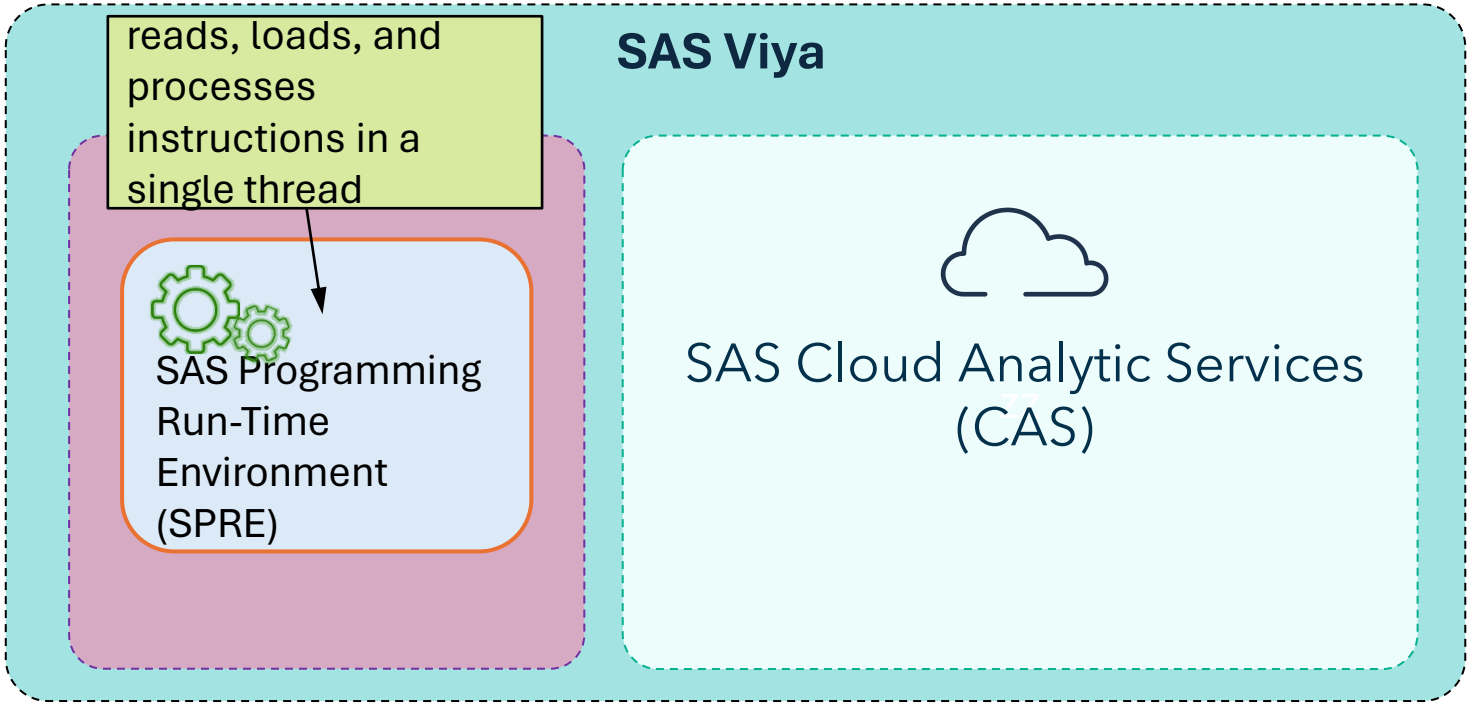
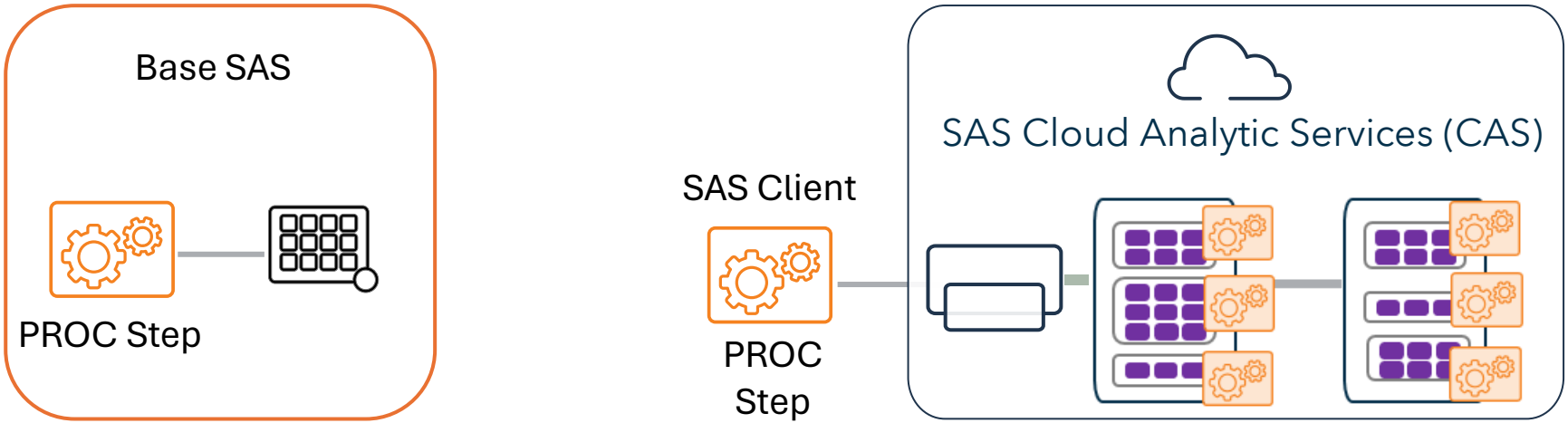
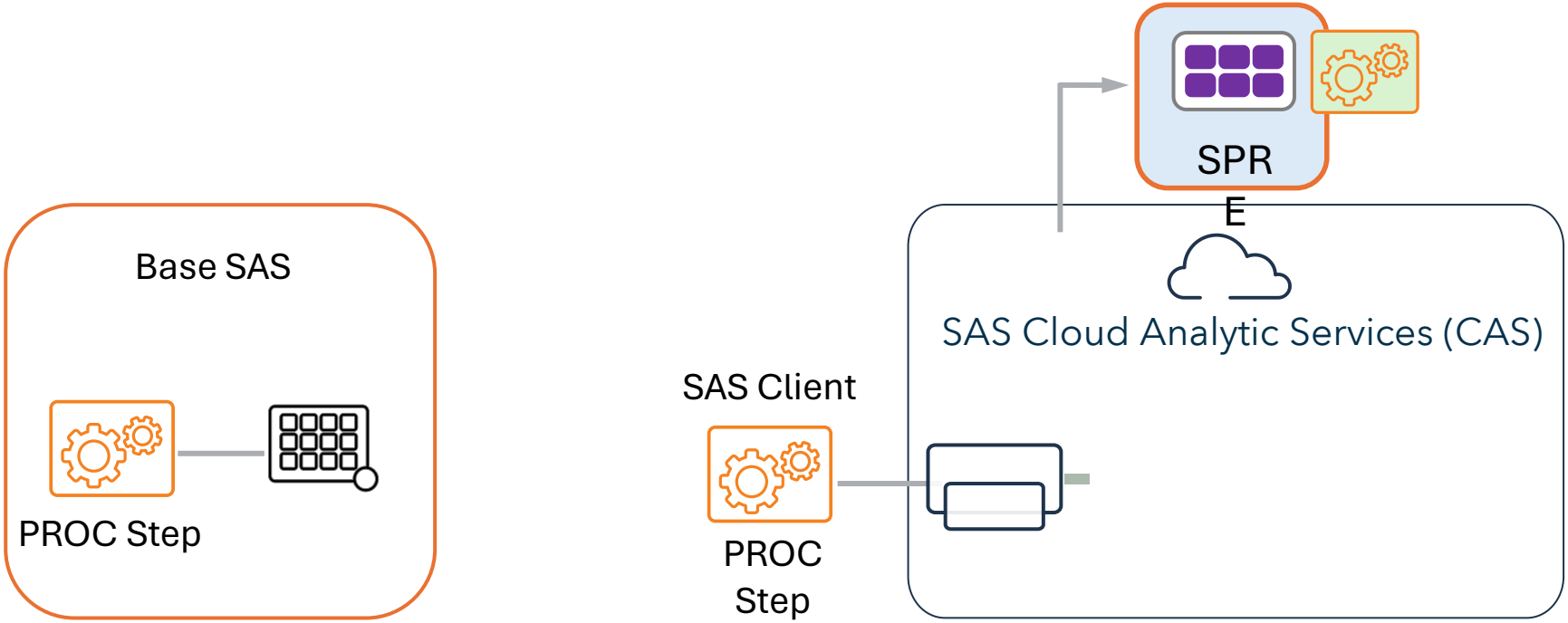
SAS DATA Step Processing



CAS-Enabled Base SAS Procedures

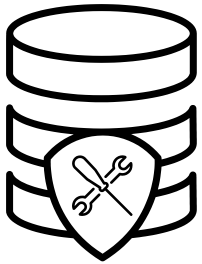


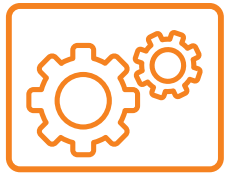
CAS-Enabled Base SAS Procedures



CAS-Enabled Base SAS Procedures

Data Management



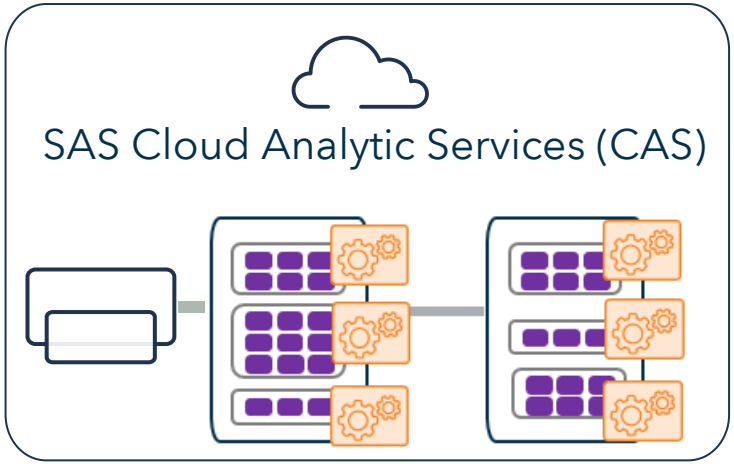


PROC CONTENTS

PROC COPY

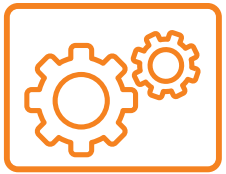
PROC DATASETS

PROC DELETE

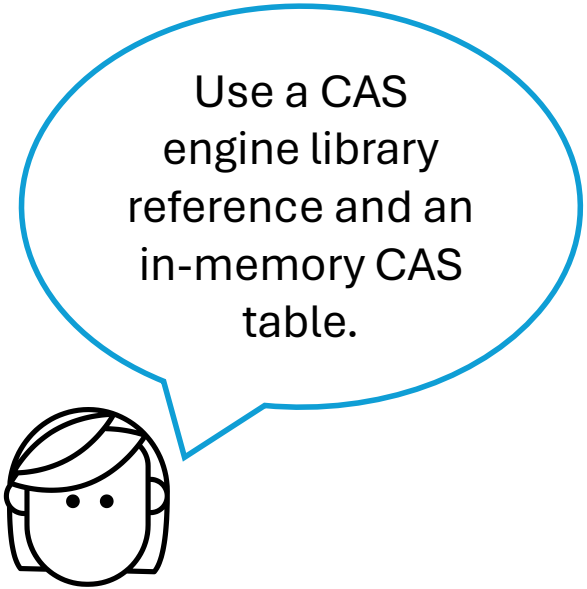


CAS-Enabled Base SAS Procedures

Data Management



- PROC CONTENTS
- PROC COPY
- PROC DATASETS
- PROC DELETE



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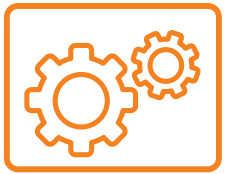
CAS-Enabled Base SAS Procedures

Data Management



Use a CAS engine library reference and an in-memory CAS table.

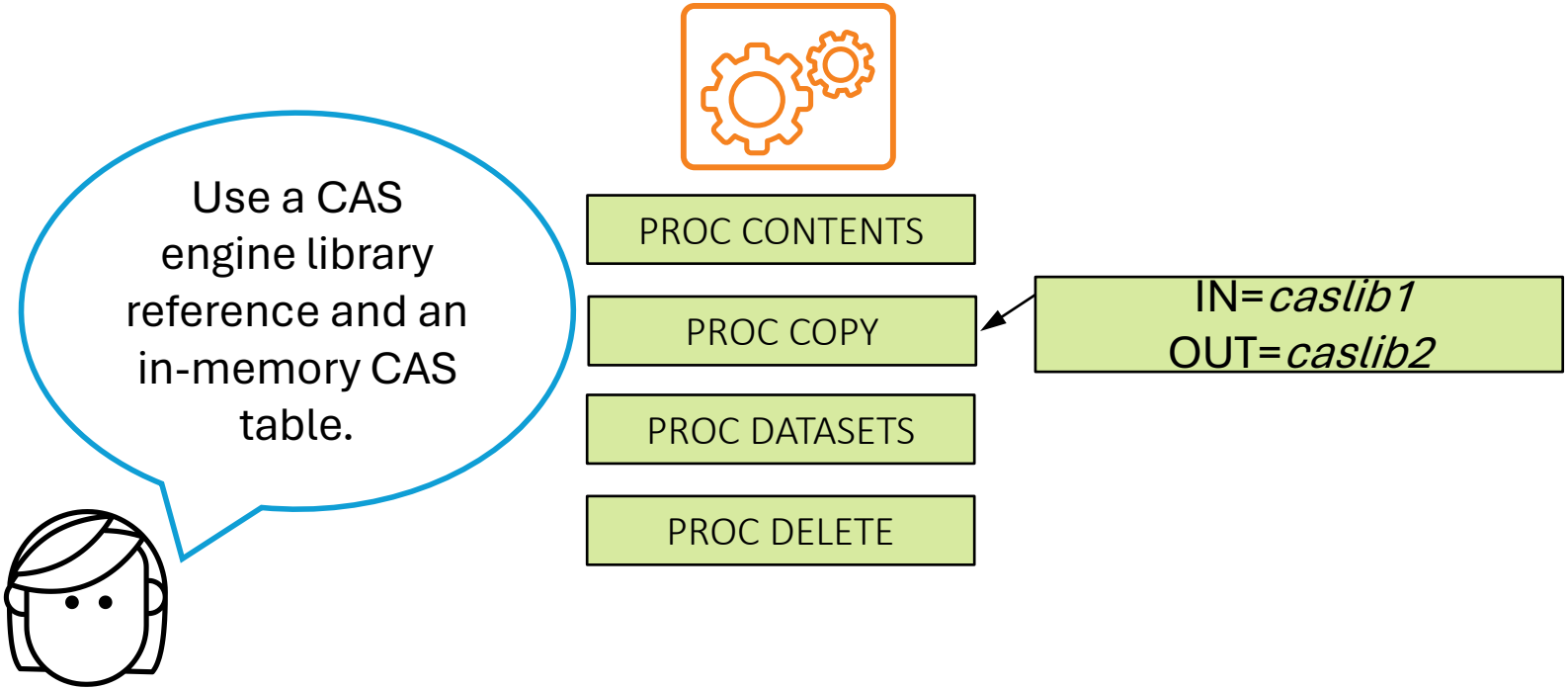
- PROC CONTENTS
- PROC COPY
- PROC DATASETS
- PROC DELETE

DATA=*caslib.CAS-table-name*

...

CAS-Enabled Base SAS Procedures

Data Management



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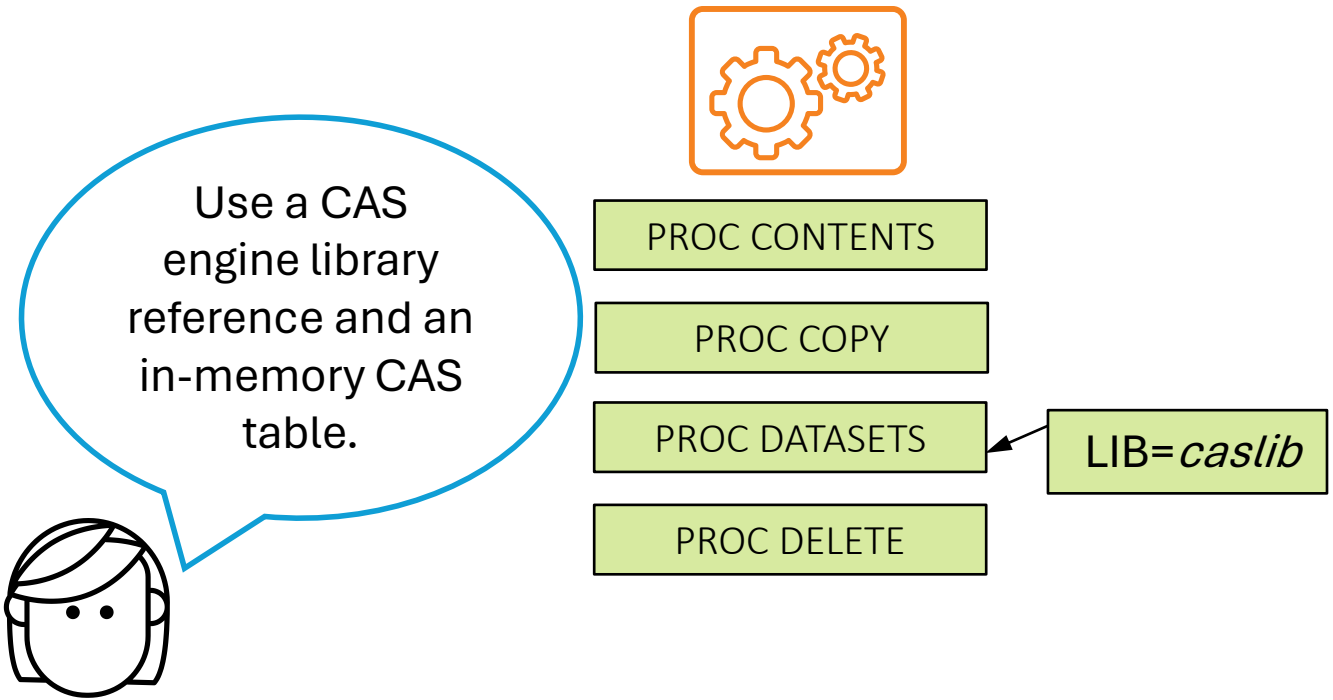
CAS-Enabled Base SAS Procedures

Data Management



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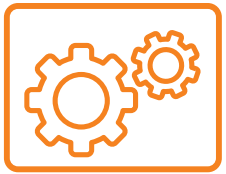
CAS-Enabled Base SAS Procedures

Data Management



Use a CAS engine library reference and an in-memory CAS table.

- PROC CONTENTS
- PROC COPY
- PROC DATASETS
- PROC DELETE

LIB=*caslib* | DATA=*caslib.CAS-table-name(s)*

...