

sas **innovate**
2025

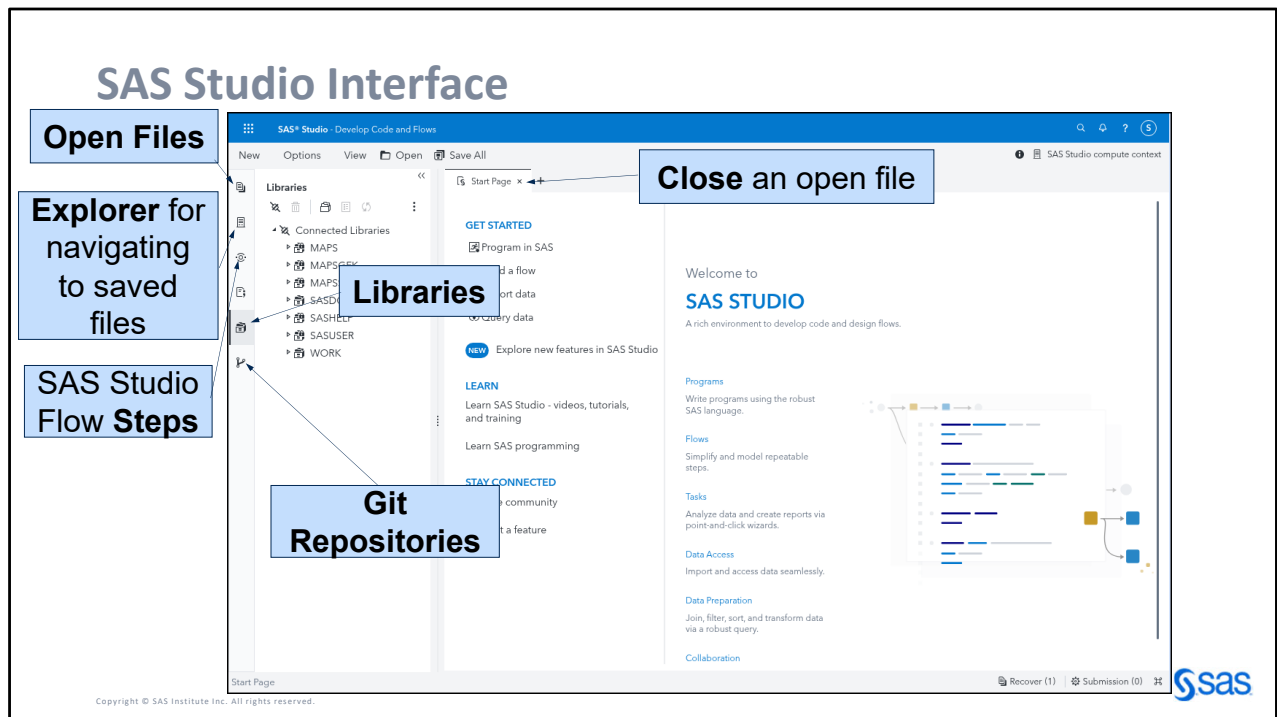
Build SAS® Studio Flows

Hands-on Workshop

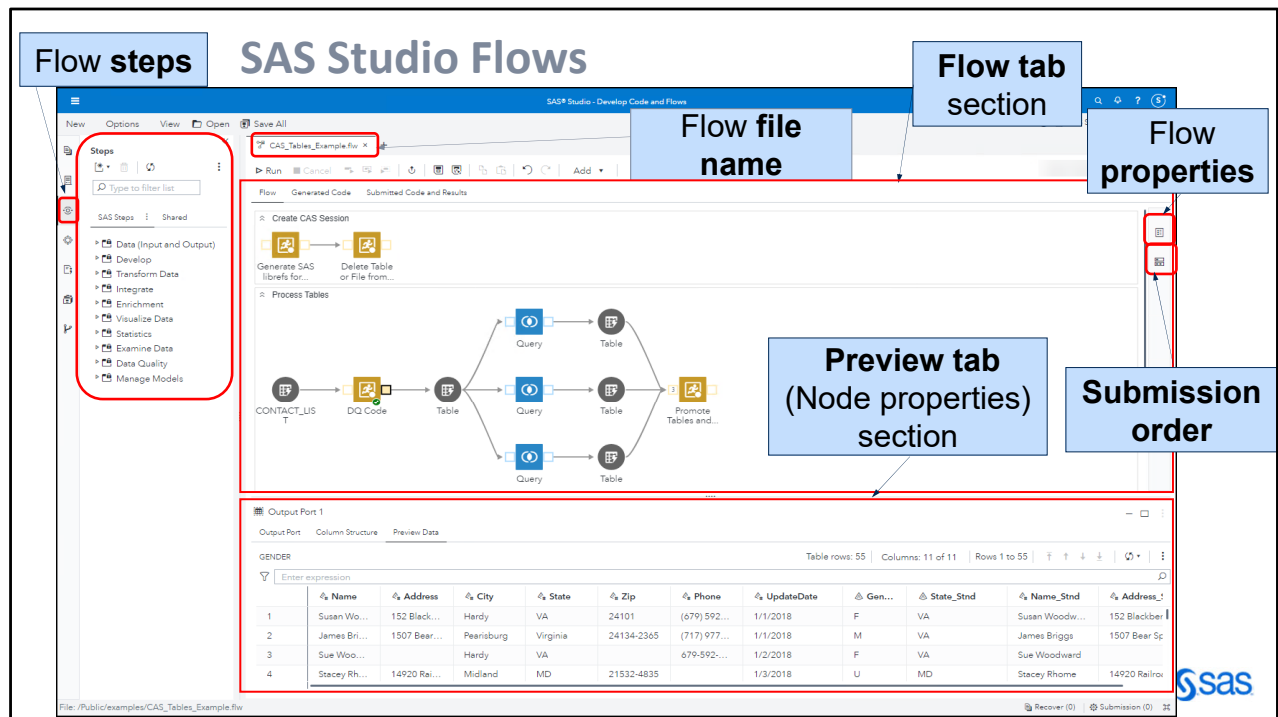
Mary Kathryn Queen
SAS EDU Content Development Group

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SAS® Studio Flows provide a visual, drag-and-drop interface within SAS® Studio that allows users to build, manage, and execute complex analytics workflows without writing code. In this hands-on workshop you'll learn to build a flow using steps to access, prepare, and analyze your data.



SAS Studio is used to write your own programs or flows. You can also use the pre-defined tasks or code snippets. When you first open SAS Studio, the **Start Page** is available, allowing you to quickly get started writing a new SAS program, building a flow, importing data, or creating a query. Use the icons on the left-hand side to access the different sections of the navigation pane.



At the top of the tab is the name of the SAS Studio Flow file.

On the left-hand side, the Steps pane is displayed. You can add these steps to your flow canvas.

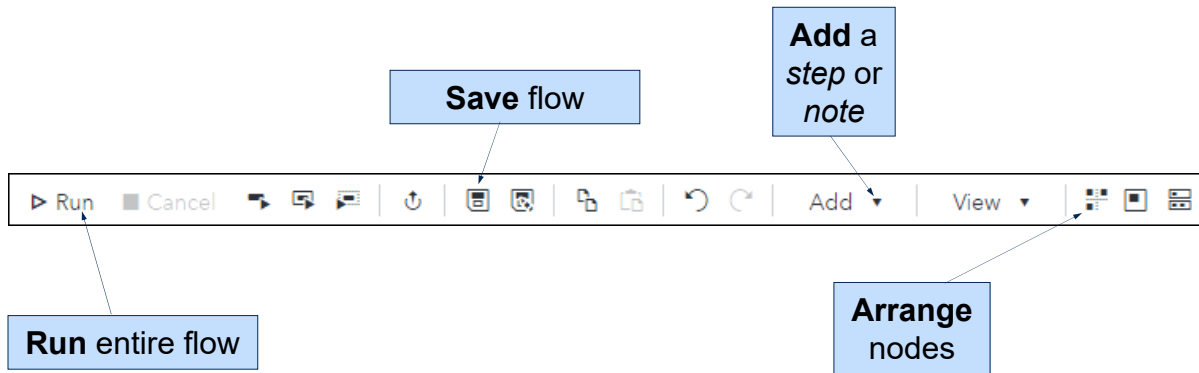
The upper part of the main section is the Flow tab section.

On the right-hand side of the flow tab section is the Flow properties and submission order buttons.

On the bottom-half of the screen is the Preview tab section also known as the node properties section.

SAS Studio Flows

Toolbar

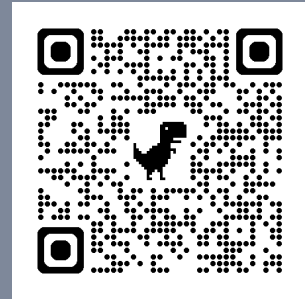


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Hands-on Exercise

Build a SAS Studio Flow



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Steps in **Build_SAS_Studio_Flow.pdf** located here:
<https://github.com/SAS-Innovate-2025/Build-SAS-Studio-Flows/tree/main>



Build a SAS Studio Flow

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Exercise Description

SAS Studio flows provide a visual, drag-and-drop interface within SAS Studio that allows users to build, manage and execute complex analytics workflows without writing code. In this hands-on workshop, you'll learn to build a flow using steps to access, prepare and analyze your data.

You will create a SAS Studio flow that uses SAS data and an imported text file. You will join the data sets and write the output to a SAS Library.



SAS Viya Logon Info

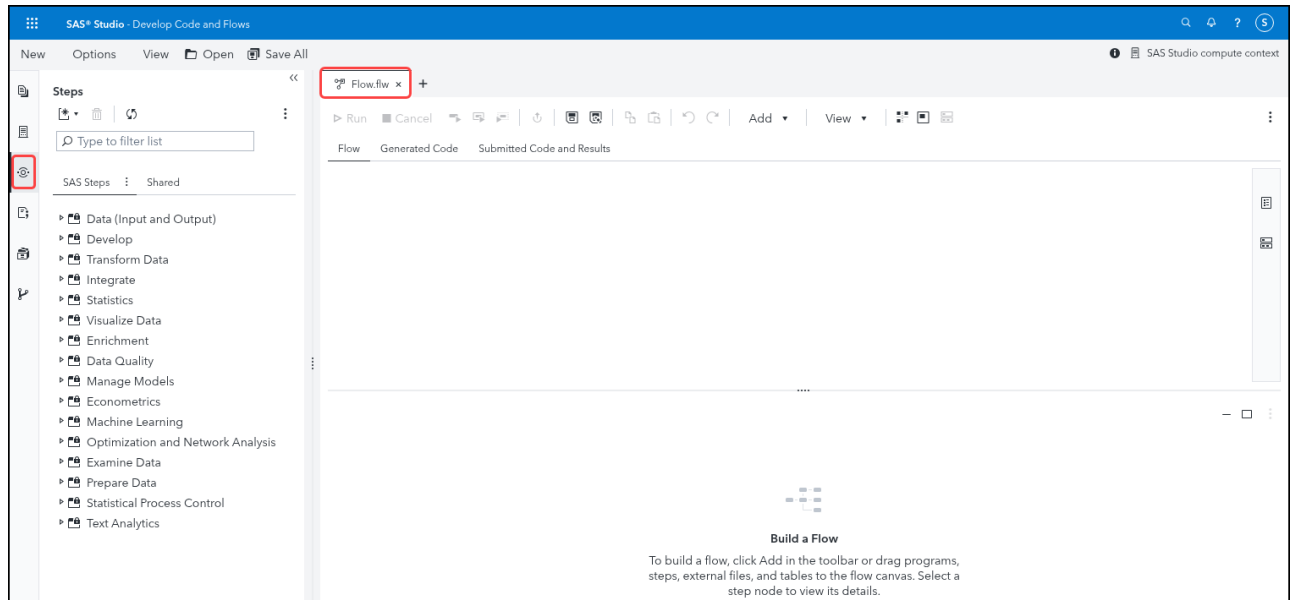
Use the *Google Chrome* browser and select the **SAS Drive** bookmark.

ID: **student** Password: **Metadata0**

Select **No** when prompted about accepting *Admin* privileges.

Create a SAS Studio Flow

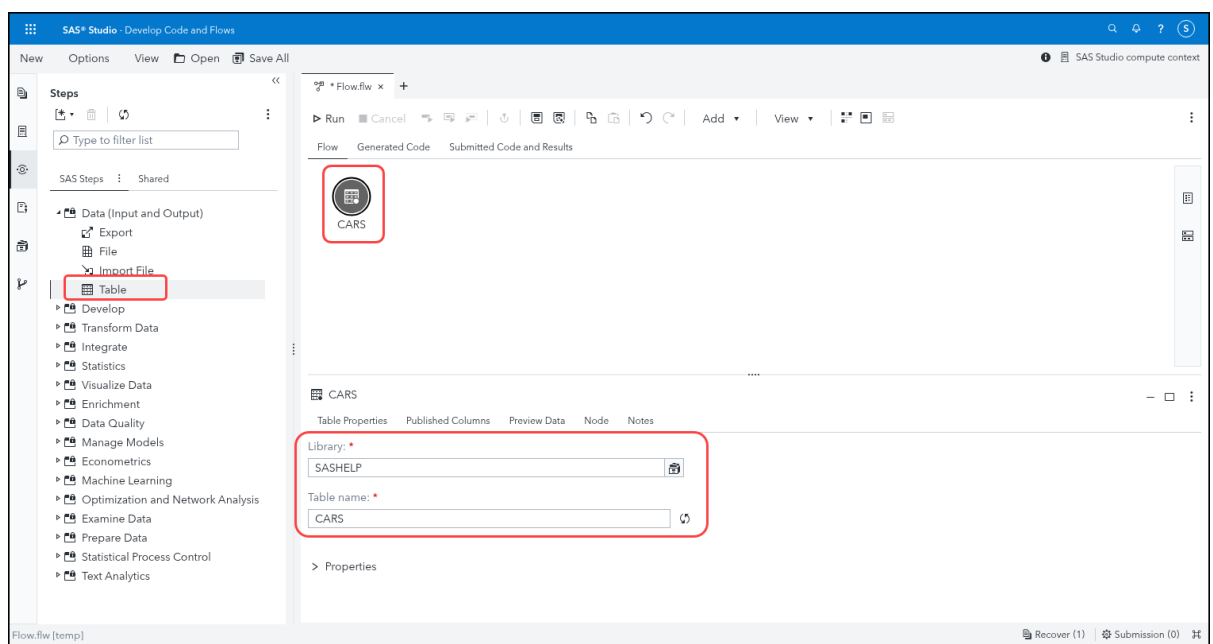
1. Select  → **Develop Code and Flows** to open *SAS Studio*.
2. Select **New** → **Flow**.
3. Select  to view the **Steps** pane.



4. Double-click the **Table** step in the *Data (Input and Output)* section of the *Steps* pane to add it to the flow canvas.

5. In the **Table Properties** section select the following:

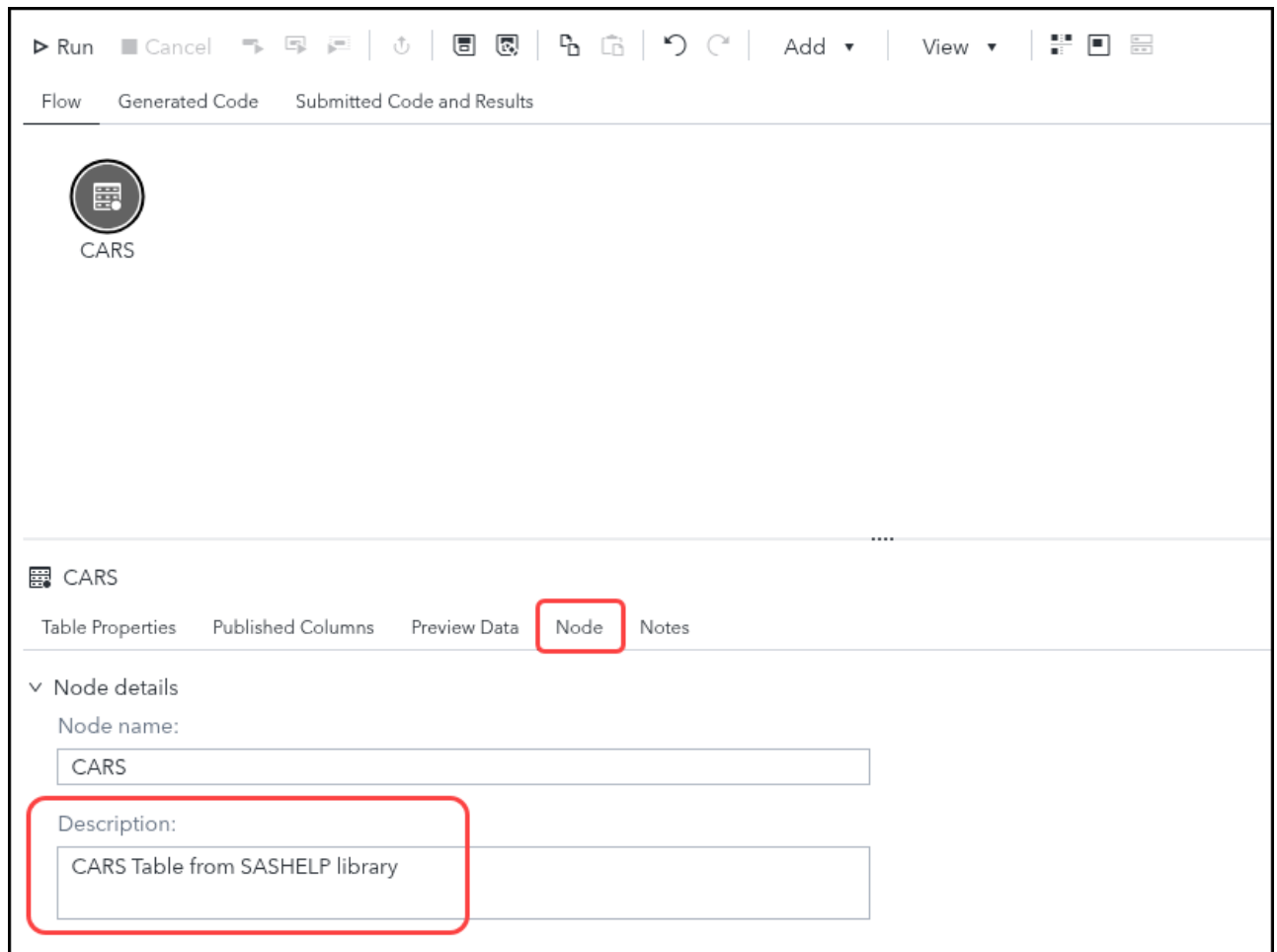
- Library: **SASHELP**
- Table name: **CARS**




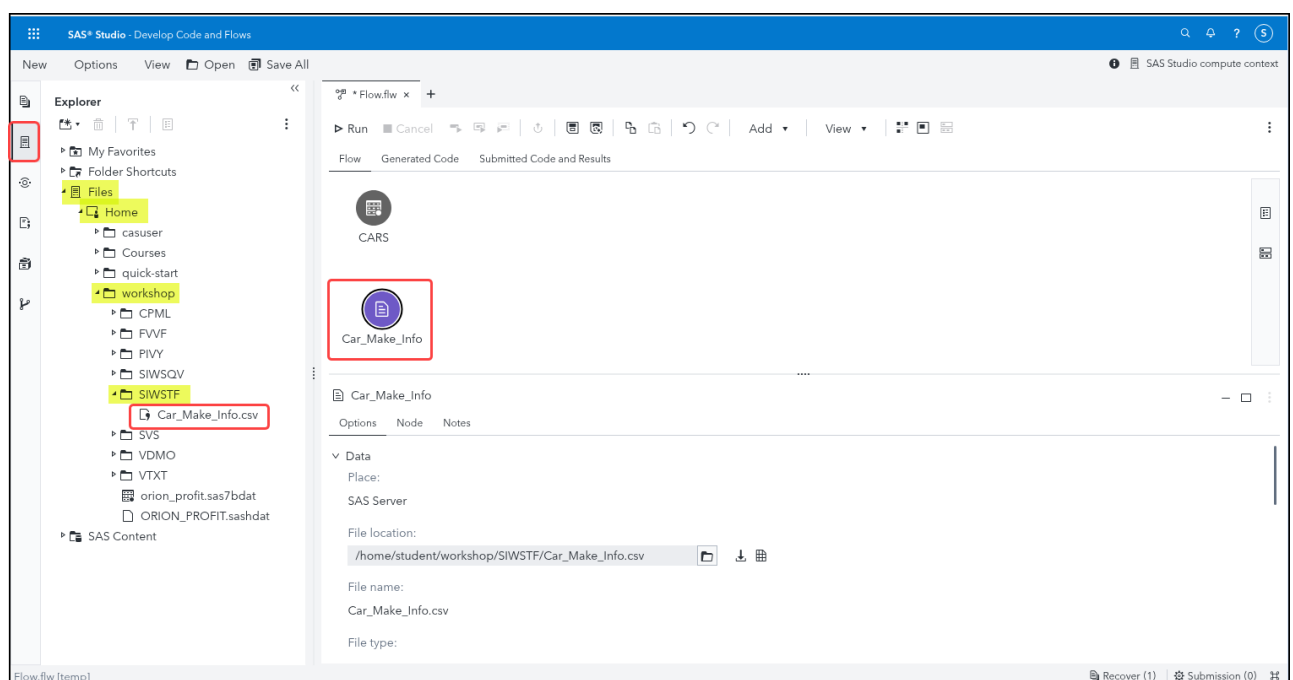
6. Select **Preview Data** to view a subset of the rows from the table.


7. Select **Node** to name the step in the flow.

8. Add *Description* to **CARS Table from SASHELP library**.




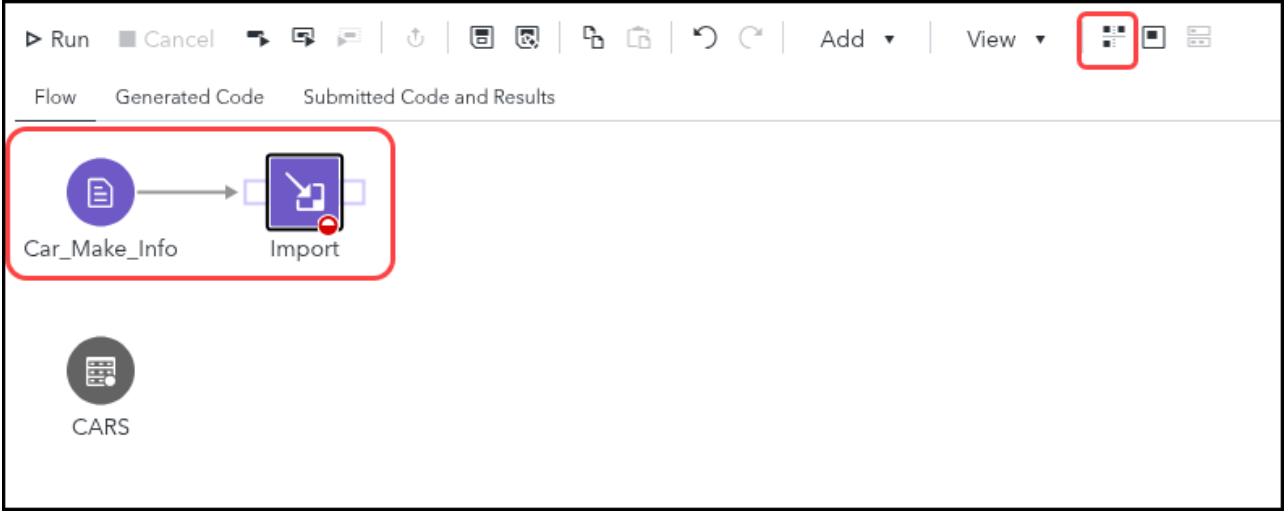
9. Select  to open the **Explorer** pane.
10. Navigate to **Files** → **Home** → **workshop** → **SIWSTF**.
11. Drag the file **Car_Make_Info.csv** on to the flow canvas.



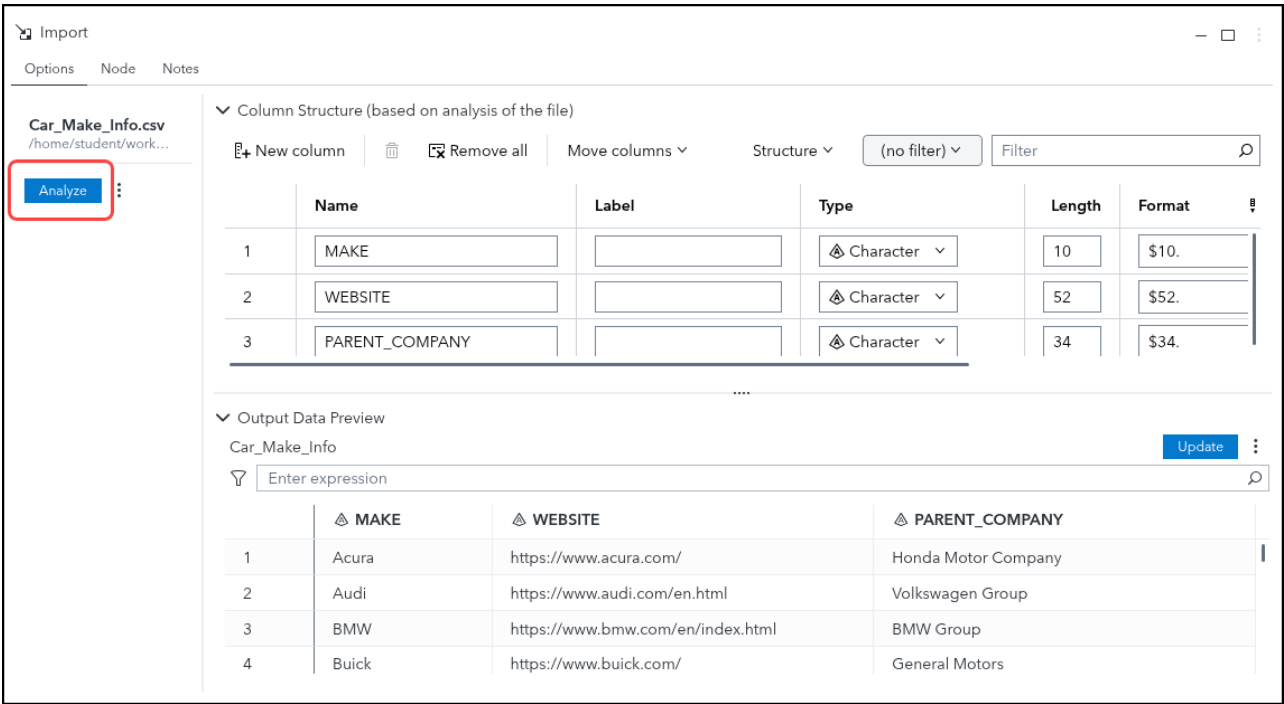
12. Select  → **Import** to add the *Import* step to the flow canvas.

13. Use the mouse to connect the the *Car_Make_Info* file step to *Import* step.

14. Select  to rearrange the steps in the flow.



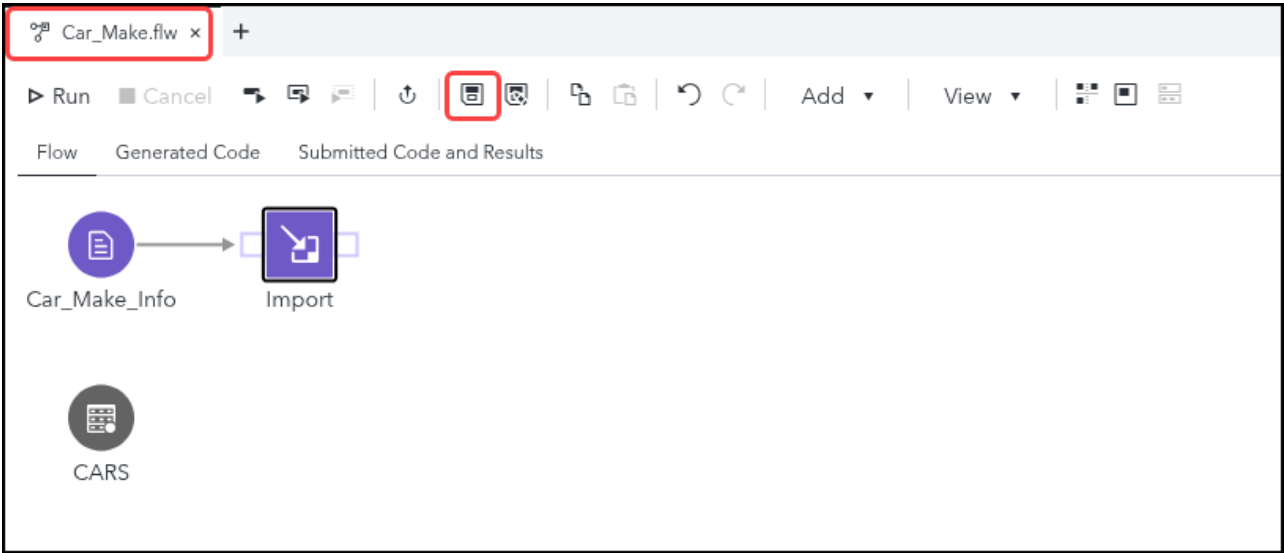
15. In the *Options* section for the *Import* step, select **Analyze** to generate the columns for the connected file.




16. Select  to save the flow.

17. Navigate to **SAS Content** → **Public**.

18. Enter **Car_Make** for the *name* and click **Save**.

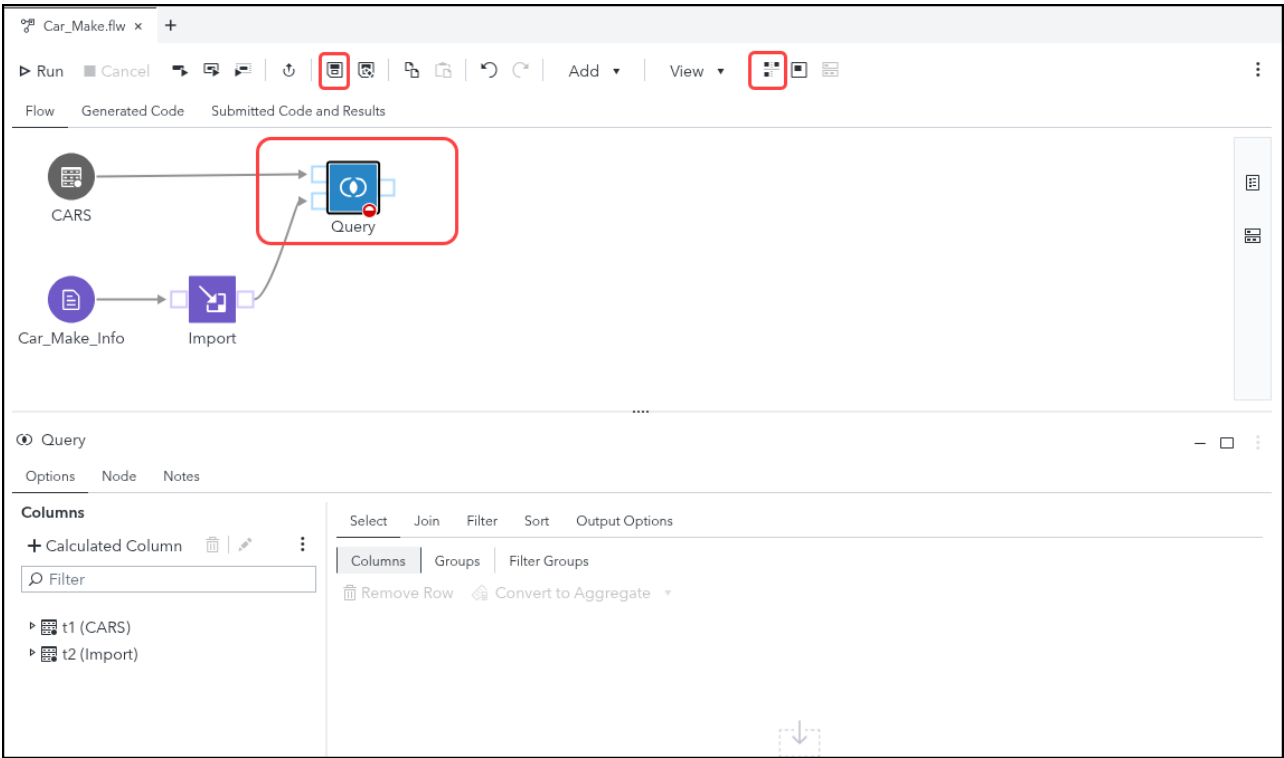


Join the Table and Imported File

- 1. Select  to return to the **Steps** pane.
- 2. Add the **Query** step in the *Transform Data* section of the *Steps* pane to the flow canvas and connect it to both the **CARS Table** step and the **Import** step. This creates two input ports for the *Query* step.

❏ You can drop the **Query** node on the right-hand side of the **CARS Table** node in flow canvas to auto-connect them and then manually connect the *Import* step to it.

- 3. **Rearrange** the flow and **save** it.



- 4. Select the following columns on the *Select* tab:

| Table | Source | Name | Label |
|-------|----------------|----------------|----------------|
| t2 | PARENT_COMPANY | Parent_Company | Parent Company |
| t1 | Make | Make | Car Make |
| t1 | Model | Model | Car Model |
| t1 | Type | Type | Car Type |
| t1 | Origin | Origin | Car Origin |
| t1 | MSRP | MSRP | MSRP |
| t1 | Invoice | Invoice | Invoice |
| t2 | WEBSITE | Website | Main Website |

✎ This assumes that **t1** is the *CARS Table* step and **t2** is the *Import* step.

The screenshot shows the SAS Query Editor interface. On the left, the 'Columns' pane lists tables t1 (CARS) and t2. The main table in the center has columns Table, Source, Name, Label, and Type. A red box highlights the 'Select' tab and the main table. Another red box highlights the 'Label' column, showing values like 'Parent Company', 'Car Make', 'Car Model', 'Car Type', 'Car Origin', 'MSRP', 'Invoice', and 'Main Website'.

5. Click **+ Calculated Column** to add a calculated column.

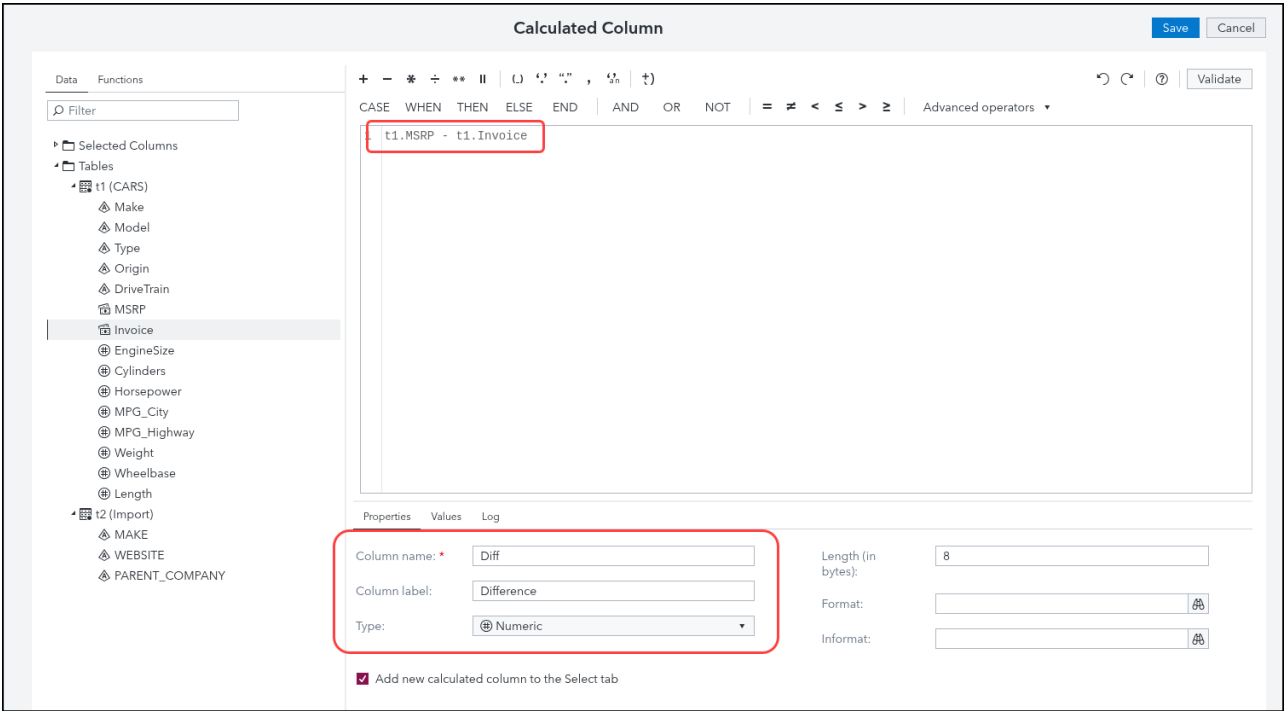
6. Enter the following for the calculation:

t1.MSRP - t1.Invoice

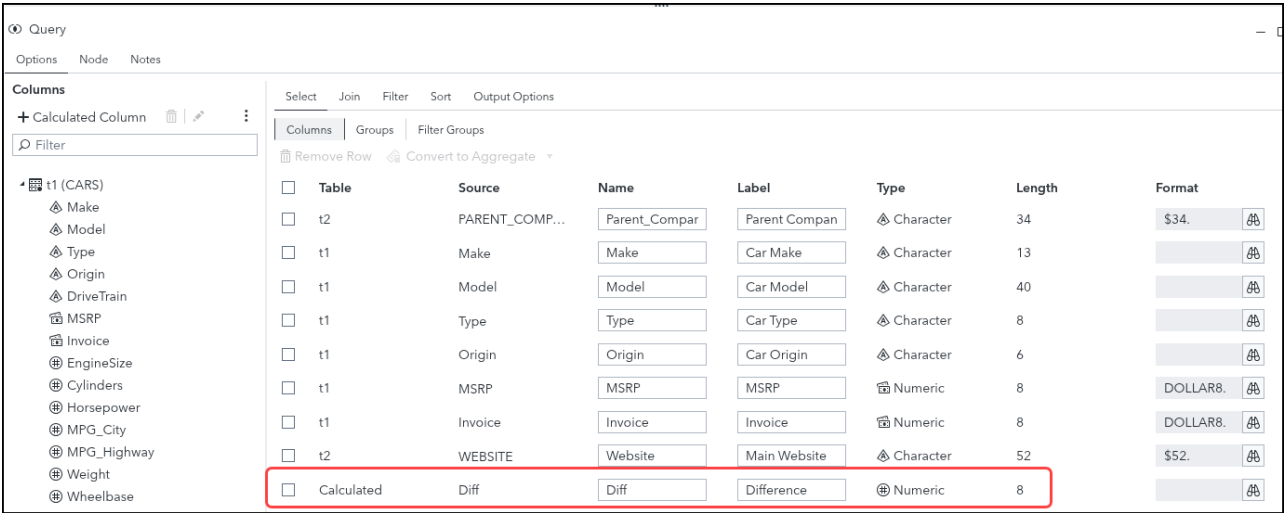
✎ This assumes that **t1** is the *CARS Table* step.

7. Enter the following for the properties:

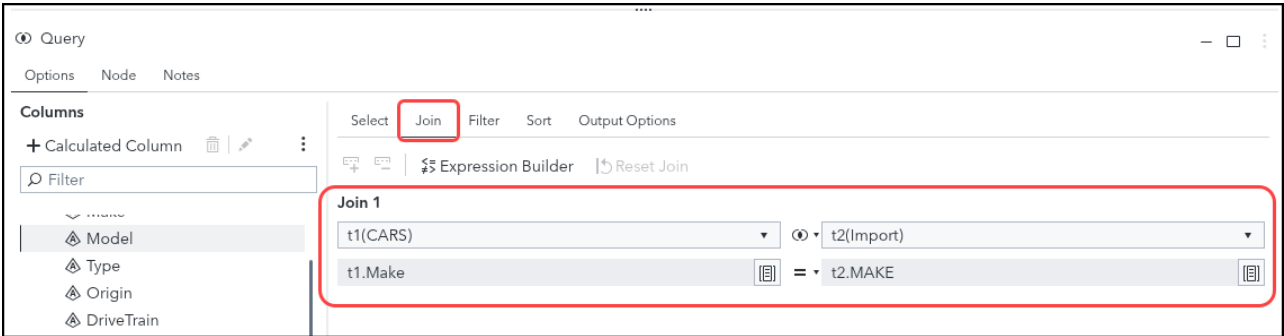
- Column name: **Diff**
- Column label: **Difference**
- Type: **Numeric**



8. Click **Save** to save the calculated column.



9. On the *Join* tab, confirm that the join condition is **t1.Make=t2.MAKE**.

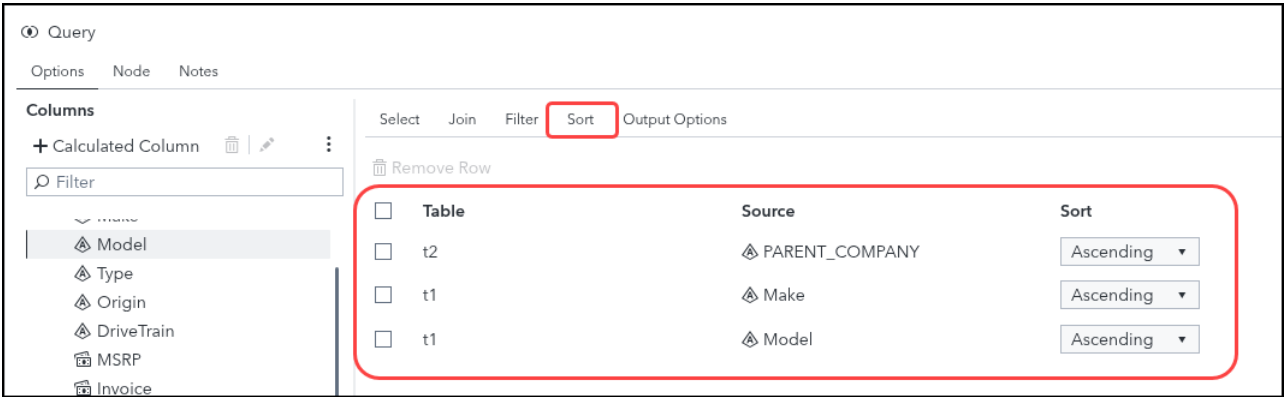


✎ This join condition is made automatically since the columns have the same name.

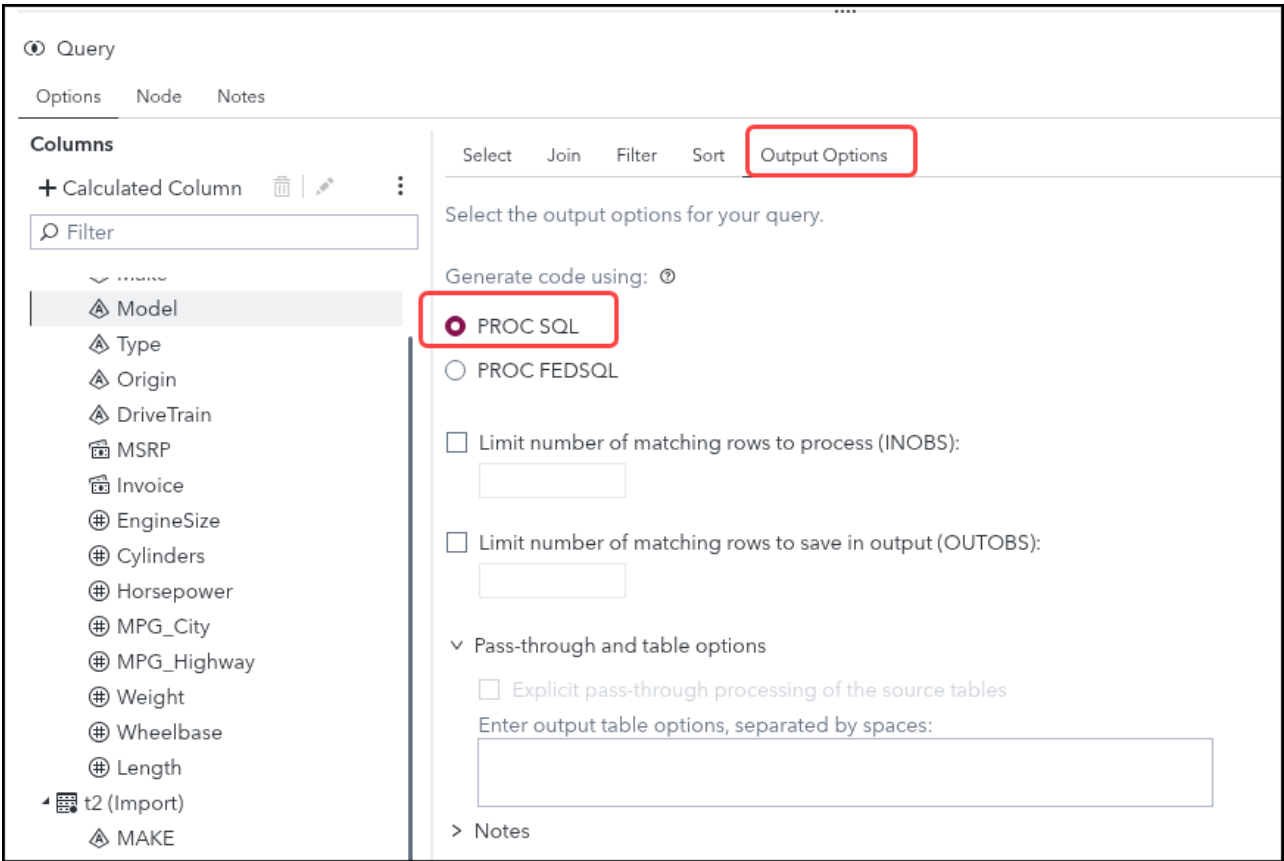
10. Select the following columns on the *Sort* tab:

| Table | Source | Sort |
|-------|--------|------|
|-------|--------|------|

| Table | Source | Sort |
|-------|----------------|-----------|
| t2 | PARENT_COMPANY | Ascending |
| t1 | Make | Ascending |
| t1 | Model | Ascending |



11. On the *Output Options* tab, leave the selection for *Generate code using as PROC SQL*.




12. **Save** the changes to the flow.

Run and Preview Results

- 1. **Run** the flow.
- 2. Select the **Output port** of the *Query* step and **preview** its results.

The screenshot shows the SAS Studio interface. At the top, the 'Run' button is highlighted with a red box. Below the workflow diagram, the 'Output table' is displayed. The 'Preview Data' tab is selected, showing a table with 394 rows and 9 columns. The columns are Model, Type, Origin, MSRP, Invoice, Website, and Diff. The data is as follows:

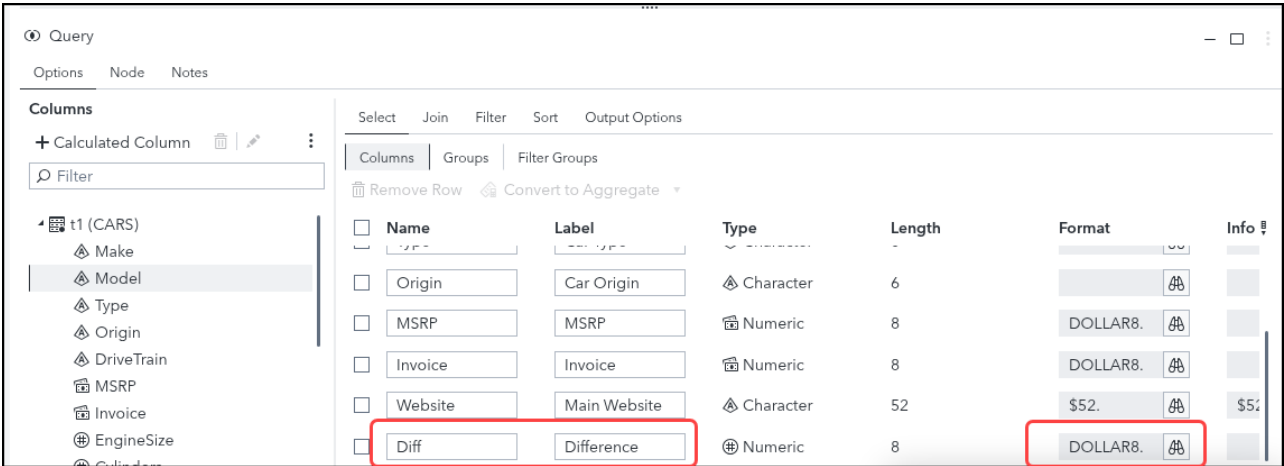
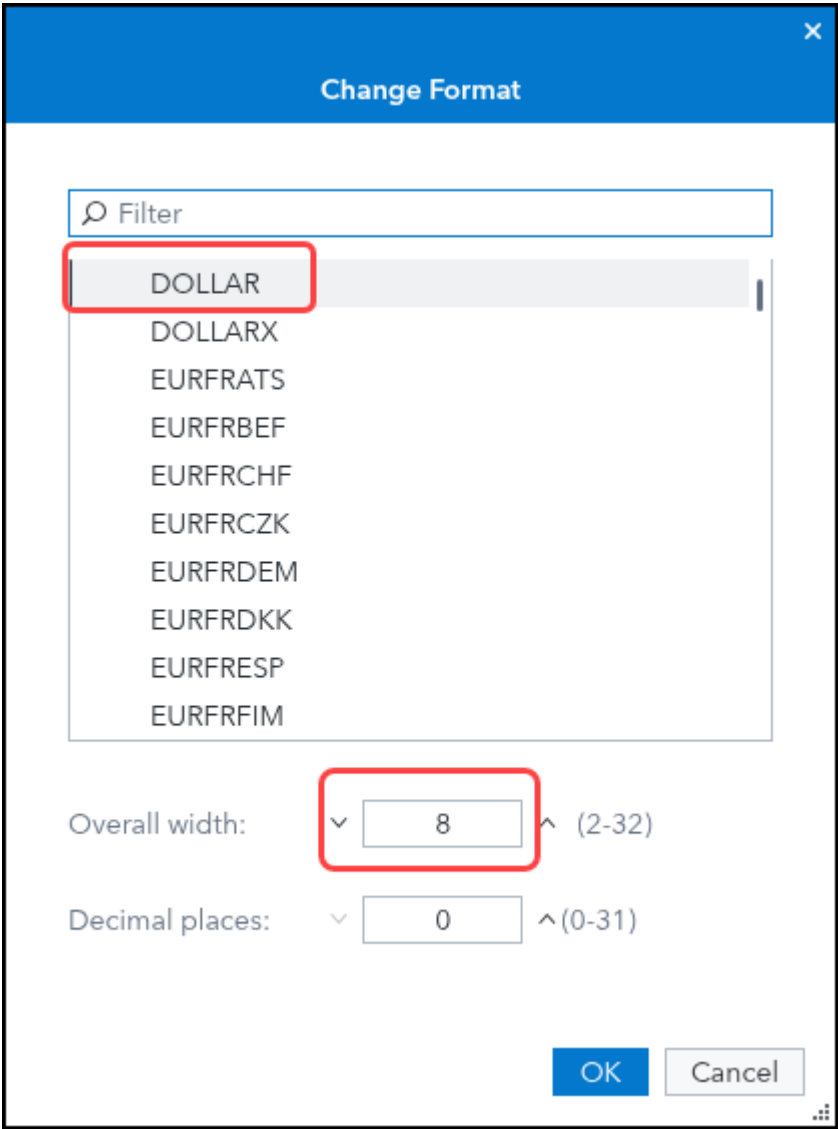
| | Model | Type | Origin | MSRP | Invoice | Website | Diff |
|---|-----------------------|-------|--------|----------|----------|-----------------------------------|------|
| 1 | 325Ci 2dr | Sedan | Europe | \$30,795 | \$28,245 | https://www.bmw.com/en/index.html | 2550 |
| 2 | 325Ci convertible 2dr | Sedan | Europe | \$37,995 | \$34,800 | https://www.bmw.com/en/index.html | 3195 |
| 3 | 325i 4dr | Sedan | Europe | \$28,495 | \$26,155 | https://www.bmw.com/en/index.html | 2340 |
| 4 | 325i 4dr | Sedan | Europe | \$30,245 | \$27,745 | https://www.bmw.com/en/index.html | 2500 |
| 5 | 325xi Sport | Wagon | Europe | \$32,845 | \$30,110 | https://www.bmw.com/en/index.html | 2735 |
| 6 | 330Ci 2dr | Sedan | Europe | \$36,995 | \$33,890 | https://www.bmw.com/en/index.html | 3105 |
| 7 | 330Ci convertible 2dr | Sedan | Europe | \$44,295 | \$40,530 | https://www.bmw.com/en/index.html | 3765 |

3. On the *Select* tab, of the *Query* node, select  in the *Format* column for the **Diff** calculated column.

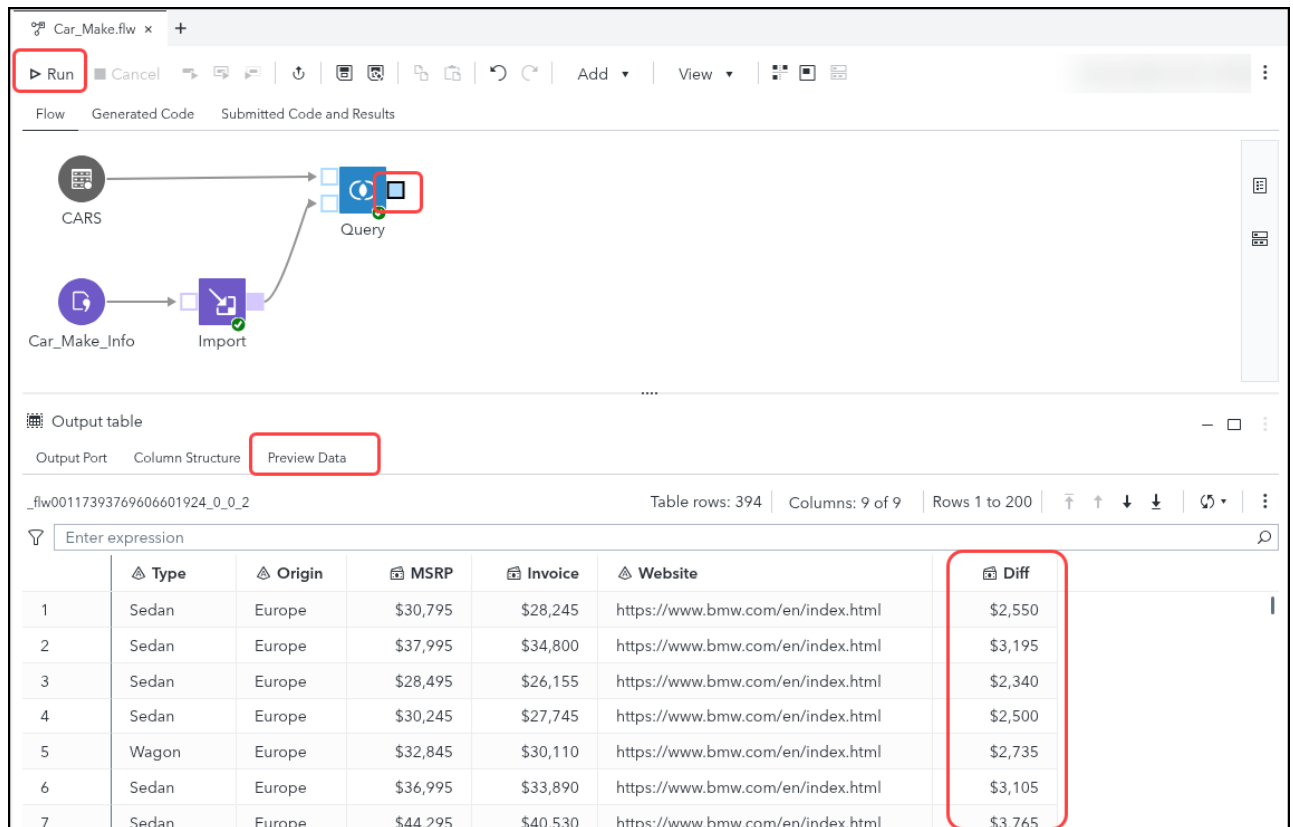
The screenshot shows the 'Query' node configuration in SAS Studio. The 'Select' tab is active, and the 'Diff' column is highlighted. The format for the 'Diff' column is set to 'DOLLAR8'.

| Name | Label | Type | Length | Format | Info |
|---------|--------------|-----------|--------|----------|-------|
| Origin | Car Origin | Character | 6 | | |
| MSRP | MSRP | Numeric | 8 | DOLLAR8. | |
| Invoice | Invoice | Numeric | 8 | DOLLAR8. | |
| Website | Main Website | Character | 52 | \$52. | \$52. |
| Diff | Difference | Numeric | 8 | DOLLAR8. | |

4. Set the format to **DOLLAR8** and click **OK**.



- 5. **Save** the changes to the flow.
- 6. **Run** the flow and select the **Output port** of the *Query* step and **preview** its results.



Output table

Output Port Column Structure Preview Data

_flw00117393769606601924_0_0_2 Table rows: 394 Columns: 9 of 9 Rows 1 to 200

Enter expression

| | Type | Origin | MSRP | Invoice | Website | Diff |
|---|-------|--------|----------|----------|-----------------------------------|---------|
| 1 | Sedan | Europe | \$30,795 | \$28,245 | https://www.bmw.com/en/index.html | \$2,550 |
| 2 | Sedan | Europe | \$37,995 | \$34,800 | https://www.bmw.com/en/index.html | \$3,195 |
| 3 | Sedan | Europe | \$28,495 | \$26,155 | https://www.bmw.com/en/index.html | \$2,340 |
| 4 | Sedan | Europe | \$30,245 | \$27,745 | https://www.bmw.com/en/index.html | \$2,500 |
| 5 | Wagon | Europe | \$32,845 | \$30,110 | https://www.bmw.com/en/index.html | \$2,735 |
| 6 | Sedan | Europe | \$36,995 | \$33,890 | https://www.bmw.com/en/index.html | \$3,105 |
| 7 | Sedan | Europe | \$44,295 | \$40,530 | https://www.bmw.com/en/index.html | \$3,765 |

✎ The *Diff* column is now formatted correctly.

Add Output Table Step to Flow

1. Add a **Table** step from the *Data (Input and Output)* section to the flow and connect it to the *Output port* of the **Query** step.
2. In the **Table Properties** section select the following:
 - Library: **WORK**
 - Table name: **CARS_INFO**

✎ This creates an output table for the flow. You will need to type the new table name.

The screenshot displays the SAS Studio Flow Builder interface. At the top, a tab labeled '* Car_Make.flw x' is active. Below the tab is a toolbar with icons for Run, Cancel, and various flow control actions. The main workspace shows a flow diagram with three nodes: 'CARS' (a circular node with a database icon), 'Query' (a square node with a magnifying glass icon), and 'CARS_INFO' (a circular node with a database icon). Arrows indicate the flow from 'CARS' to 'Query' and from 'CARS_INFO' to 'Query'. A red box highlights the 'CARS_INFO' node. Below the flow diagram, the 'CARS_INFO' table properties are shown. A warning message states: 'No columns were found. The table defined in the Table Properties may not exist yet.' Below this, the 'Table Properties' tab is selected, showing the 'Library' field set to 'WORK' and the 'Table name' field set to 'CARS_INFO'. A red box highlights these fields. At the bottom, there are radio buttons for 'Create a physical table' (selected) and 'Create a view'.

Flow Diagram:

```
graph LR; CARS((CARS)) --> Query[Query]; Car_Make_Info((Car_Make_Info)) --> Import[Import]; Import --> Query; Query --> CARS_INFO((CARS_INFO));
```

Table Properties:

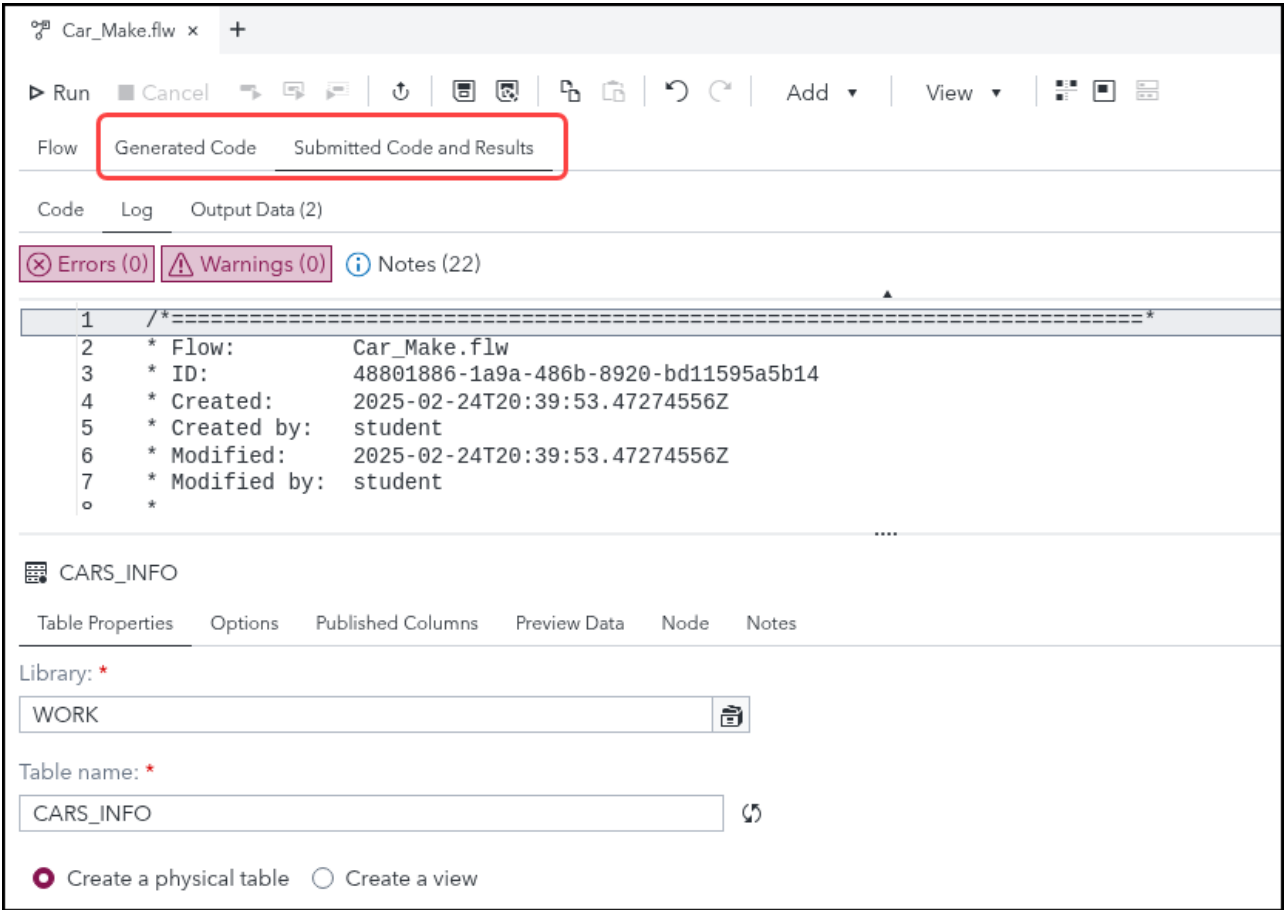
Library: *
WORK


Table name: *
CARS_INFO

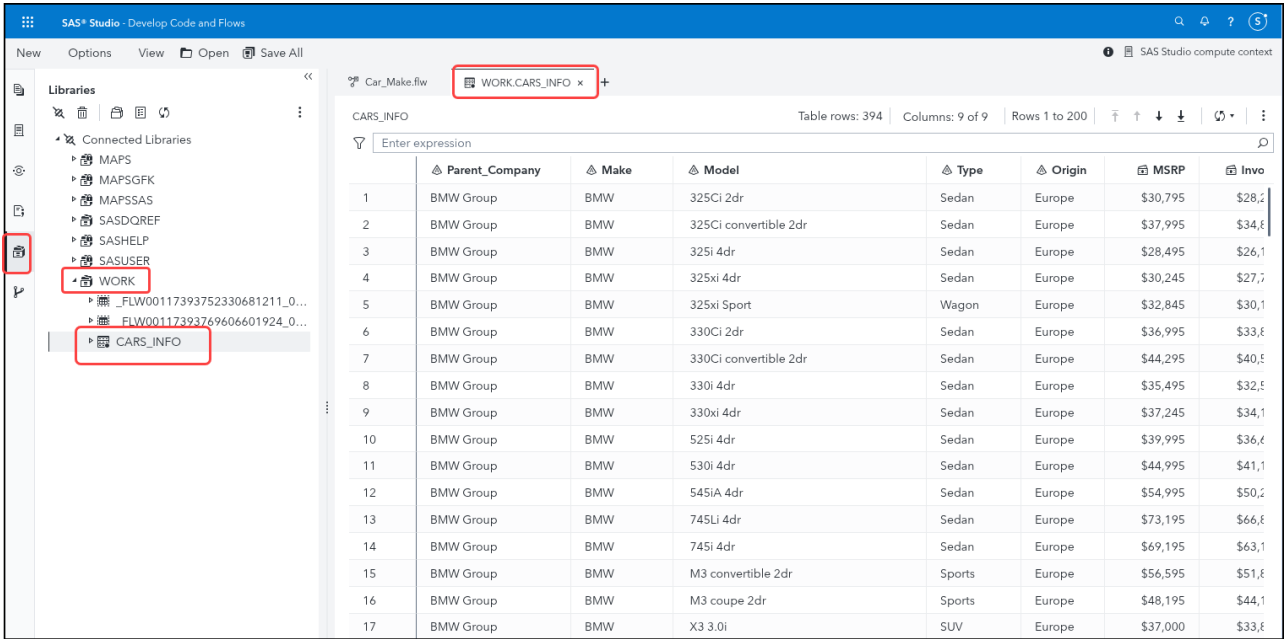
☒ Create a physical table ☐ Create a view

3. **Save** and **Run** the flow.

4. View the **Generated Code** and the **Submitted Code and Results** tabs.



5. Select  to view the Libraries pane.
6. Double-click the **CARS_INFO** table in the **WORK** SAS library to open it for viewing.



7. **Close** the *Table* and the *Flow* file.

Exercise Completed

YOU HAVE COMPLETED THE EXERCISE ON BUILDING A SAS STUDIO FLOW!

For additional information on SAS Studio Flows, please refer to its [documentation](#).

THANKS FOR ATTENDING THIS WORKSHOP!

SAS Studio Flows

Resources



Training Courses:

- [Building SAS® Studio Flows in SAS® Viya®](#)
- [Using SAS Studio Flows and Custom Steps in SAS® Viya® Fast Track](#)
- [Transitioning SAS® Enterprise Guide® Projects to SAS® Studio Flows](#)
- [Managing and Querying Data Using Flows in SAS Studio](#)
- [Using SAS® Studio Engineer Steps in SAS® Studio Flows](#)
- [Scheduling and Orchestrating SAS® Programs and Flows with Apache Airflow](#)

Documentation:

- [SAS Help Center: SAS Studio: Working with Flows](#)

SAS Community Articles:

- [Search - SAS Support Communities for SAS Studio Flows](#)

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Training Courses:

- [Building SAS® Studio Flows in SAS® Viya®](#):
<https://learn.sas.com/course/view.php?id=217>
- [Using SAS Studio Flows and Custom Steps in SAS® Viya® Fast Track](#):
<https://learn.sas.com/course/view.php?id=6593>
- [Transitioning SAS® Enterprise Guide® Projects to SAS® Studio Flows](#):
<https://learn.sas.com/course/view.php?id=475>
- [Managing and Querying Data Using Flows in SAS Studio](#):
<https://learn.sas.com/course/view.php?id=7084>
- [Using SAS® Studio Engineer Steps in SAS® Studio Flows](#):
<https://learn.sas.com/course/view.php?id=6437>
- [Scheduling and Orchestrating SAS® Programs and Flows with Apache Airflow](#): <https://learn.sas.com/course/view.php?id=7298>

Documentation:

- [SAS Help Center: SAS Studio: Working with Flows](#):
<https://go.documentation.sas.com/doc/en/sasstudiocdc/default/we>

beditorcdc/webeditorflows/titlepage.htm

SAS Community Articles:

- [Search - SAS Support Communities for SAS Studio Flows:](https://communities.sas.com/t5/forums/searchpage/tab/message?advanced=false&allow_punctuation=false&q=SAS%20Studio%20Flows)
https://communities.sas.com/t5/forums/searchpage/tab/message?advanced=false&allow_punctuation=false&q=SAS%20Studio%20Flows

Thanks for attending this hands-on session!

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