Quick Overview of SAS Studio

PhUSE – February 2019
What is SAS® Studio?

- SAS® Studio is a web interface application for SAS that is accessed through our web browser.
- With SAS® Studio, we can:
  - access data files, libraries, and existing programs, and write new programs
  - use the predefined tasks in SAS® Studio to generate SAS code
- When we run a program or task, SAS® Studio connects to a SAS server to process the SAS code. In our case, we are using SAS® Studio Basic, so our SAS® Studio URL only connects to a single SAS Server in a one to one relationship. After the code is processed, the results are returned to SAS® Studio in our browser
- SAS® Studio supports multiple web browsers, such as Microsoft Internet Explorer, Mozilla Firefox, Apple Safari and Google Chrome
- Includes:
  - Coding Editor
  - Results Viewer
  - Data Viewer
Why would you use SAS Studio?

- Modernize
  - SAS® Institute is preparing for Viya and SAS Grid

- SAS Users have three choices:
  - SAS Windowing Environment (Late 1980’s)
  - SAS Studio (2014) - Future of SAS®

- SAS University Edition: free for learning purposes
What about SAS Studio?

- Comes with Base SAS
  - Local computer (single-user version)
  - SAS Servers on a network (e.g. Linux)
- SAS Studio
  - Opens in a web browser
  - Programs are submitted to SAS Server
  - Results are returned to the browser
SAS Studio – Additional Benefits

- Easy access to SAS data sets
  - View data, columns and properties on one screen
  - Easily sort and filter data in the viewer
- On-demand Syntax Help
- Drag and drop variable and dataset names into code
- Code formatter
- Code snippets
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SAS Studio Tools continued…

- SAS Log Summary of Errors, Warnings and Notes
- Save Results to HTML, PDF or RTF with one click
- Access older versions of submitted code
- Built-in tasks for code generation
- Interactive PROC SQL code generation
Creating Folder Shortcuts from Folders

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Navigating a SAS Dataset in the Viewer

6. Rearrange columns by dragging and dropping column headings, or dragging and dropping column names in Columns section on the left.
Navigating a SAS Dataset in the Viewer

6. Rearrange columns by dragging and dropping column headings, or dragging and dropping column names in Columns section on the left.
Navigating a SAS Dataset in the Viewer

7. Select columns to view in Columns section on the left
Navigating a SAS Dataset in the Viewer

8. Show column labels by clicking the down-arrow next to **Column names** and selecting **Column labels**
1. Click any column heading to change sort order
   a) Right-click column heading and select sort order
### Sorting and Filters

2. Right-click Systolic column heading and select Add Filter

![Sorting and Filters in SAS Studio](image.png)

<table>
<thead>
<tr>
<th>Status</th>
<th>DeathCause</th>
<th>AgeCHDdiag</th>
<th>Sex</th>
<th>AgeAtStart</th>
<th>Height</th>
<th>Weight</th>
<th>Cholesterol</th>
<th>Systolic</th>
<th>MR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alive</td>
<td></td>
<td>52</td>
<td>Female</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td>156</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td></td>
<td>69</td>
<td>Female</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td>168</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td></td>
<td>52</td>
<td>Female</td>
<td>52</td>
<td></td>
<td></td>
<td></td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td></td>
<td>51</td>
<td>Female</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td></td>
<td>51</td>
<td>Female</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Alive</td>
<td></td>
<td>51</td>
<td>Female</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

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3. Choose > 120 and click Filter
4. Right-click Smoking column heading and select Add Filter entering > 0 and click Filter.
5. View SQL code for the Filter by clicking the Display the code that generates the current table icon.

```sql
PROC SQL;
CREATE TABLE WORK.query AS SELECT 'Status'='n', DeathCause, AgeCHDdiag, Sex,
    AgeAtStart, Height, Weight, Diastolic, Systolic, MRW, Smoking,
    AgeAtDeath, Cholesterol, Chol_Status, BP_Status, Weight_Status,
    Smoking_Status FROM SASHELP.HEART WHERE Systolic>=120 AND Smoking>0 ORDER BY
sortkey("Status"='n', "en_US");
RUN;
QUIT;
PROC DATASETS NODISTINCT;
    CONTENTS DATA=WORK.query OUT=WORK.details;
RUN;
PROC PRINT DATA=WORK.details;
RUN;
```
6. Remove the filter by clicking the Clear filter icon next to the filter above the data table.
Maximizing Space for Dataset Review

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Maximizing Space for Dataset Review

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Comparing Datasets

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Comparing Datasets

Overview of SAS Studio – February 2019
Comparing Datasets

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Customizing Your Space
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Some Hands-On Examples of the Editor

Auto-Format Code

- Take some code and remove the formatting.
- Click the Format code icon on the toolbar above the code
More Application Options…Preferences
# More Application Options…Preferences…General

## Preferences

### General

- Start Up
- Editor
- Results
- Tasks
- Repositories
- Background Jobs

### Display

- Show generated code in the SAS log
- Include a “Show Details” button in error messages
- Size grid columns to contain
- Start new programs in Interactive mode

### Refresh

- Automatically refresh libraries after each submission
- Automatically refresh files and folders after each submission

### Character policy

- SAS variable name policy: V7
- Default text encoding: ISO-8859-1

### Messages

- Display a message on arrival
  - Duration: 5 seconds
- Capture all log events

**Reset to Defaults**
More Application Options…Preferences…Start Up

Preferences

General
Start Up
Editor
Results
Tasks
Repositories
Background Jobs

On startup
- Open a new program/process flow tab
- Continue where you left off

Session time-out
Time-out interval: 3 hours
More Application Options...Preferences...Editor

Preferences

General
Start Up
Editor
Results
Tasks
Repositories
Background Jobs

- Enable autocomplete (Ctrl+spacebar or Command+spacebar)
- Enable hint
- Tab width: 4 spaces
- Substitute spaces for tabs
- Enable color coding
- Show line numbers
- Font size: 16
- Enable autosave
- Autosave interval: 30 seconds
## Preferences

<table>
<thead>
<tr>
<th>Section</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Start Up</td>
<td></td>
</tr>
<tr>
<td>Editor</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>HTML</td>
</tr>
<tr>
<td></td>
<td>HTML output style:</td>
</tr>
<tr>
<td></td>
<td><code>HtmlBlue</code></td>
</tr>
<tr>
<td></td>
<td>Generate HTML graphs as SVG</td>
</tr>
<tr>
<td></td>
<td>Display warning if HTML results are larger than: 3 MB</td>
</tr>
<tr>
<td>PDF</td>
<td>Produce PDF output</td>
</tr>
<tr>
<td></td>
<td>PDF output style:</td>
</tr>
<tr>
<td></td>
<td><code>Pearl</code></td>
</tr>
<tr>
<td></td>
<td>Generate the default table of contents</td>
</tr>
<tr>
<td>RTF</td>
<td>Produce RTF output</td>
</tr>
<tr>
<td></td>
<td>RTF output style:</td>
</tr>
<tr>
<td></td>
<td><code>Rtf</code></td>
</tr>
<tr>
<td>Output Data</td>
<td>Automatically open generated output data</td>
</tr>
</tbody>
</table>
View and Create Code Snippets

- From the Snippets section of the navigation pane, expand Snippets to view built-in snippets
- Save your own snippet by highlighting a section of code (e.g. the LIBNAME statement) and clicking the Add to My Snippets icon on the toolbar above the code editor
- Give the snippet a name (e.g. My libname) and click Save
- Expand My Snippets in the Snippets section of the navigation pane to confirm that the snippet was saved.

```sas
%macro ODSOff();
/* Call prior to BY-group processing */
ods graphics off;
ods exclude all;
ods noresults;
options nonotes;
/* OPTIONAL: use NONOTES to suppress notes to the log */
%mend;

%macro ODSOn(); /* Call after BY-group processing */
options notes;
ods graphics on;
ods exclude none;
ods results;
%mend;
```
Snippets

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QUESTIONS
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Review SAS Studio Interface

1. The navigation pane is on the left, the work area is on the right.
2. The work area has tabs (Code, Log, and Results for the code editor).
3. Try out the Maximize icon on toolbar in work area.
4. View files in Files and Folders section of navigation pane.
5. View SAS data sets in Libraries section of navigation pane.
Creating New Libraries from Libraries

- Files and Folders
- Tasks and Utilities
- Snippets

Libraries
- My Libraries
  - MAPS
  - MAPSGFK
  - MAPSSAS
  - SASHELP
  - SASUSER
  - WEBWORK
  - WORK

- File Shortcuts
Create New SAS Libraries

1. From the Libraries section of the navigation pane, click the New Library icon ➡️
2. Give the library the name Mylib, use my file shortcut, mytest_678.
3. It fills in the expanded path: /home/wiencb00/mytest/. Click OK.
4. Expand Mylib library, then expand the Montana data set to view variable names
5. In the Files and Folders section, navigate to the folder: /home/wiencb00/mytest
6. Right-click folder name, mytest, and choose Create ► Library
7. Give the library a name different than Mylib (e.g. BDWTEST) and click OK

You now have two ways to create a Library within SAS Studio!
Navigating a SAS Dataset in the Viewer

1. Drag and drop HEART from the SASHELP library from the Library section of the navigation pane, or double-click from the Libraries section.

2. Review: Column names, Column Properties, Data, Total rows and columns.

3. Scroll through data rows over 100 by clicking arrows in upper right.

4. Size grid columns by dragging column dividers.

5. Re-size all grid columns by right-clicking any column heading and selecting **Size grid columns to content**.
Sorting and Filters

1. Click any column heading to change sort order
   a) Right-click column heading and select sort order

2. Right-click Systolic column heading and select Add Filter

3. Choose > 120 and click Filter

4. Right-click Smoking column heading and select Add Filter entering > 0 and click Filter

5. View SQL code for the Filter by clicking the Display the code that generates the current table icon

6. Remove the filter by clicking the Clear filter icon next to the filter above the data table
Try the Code Editor

1. Try out the Autocomplete feature by entering some SAS statements into the blank code editor labeled Program 1 (e.g. PROC FREQ DATA=)

2. Open the Preferences window by clicking More application options icon and selecting Preferences

3. On the Editor page of Preferences window, turn off Enable autocomplete, turn on Enable Hint, and click Save

4. Enter more SAS statements in the code editor to see the difference

5. Try using Ctrl <spacebar> to show autocomplete now that you have autocomplete turned off by default

6. Hover over keywords to show help (Hint feature)

7. From the Libraries section of the navigation pane, try dragging and dropping variable and data set names into the code editor.
Run a Program – View the Log and Results Tabs

- Run the program by clicking the Run icon on the toolbar
- Click **LOG** tab and try out navigation in the SAS log (e.g. expand Notes and click on a note in the list to jump to that line in the log)
- Click the **RESULTS** tab and try out navigation in the results (e.g. expand Table of Contents and click on a result)
- From the Results tab, click the Download the results as a PDF file icon (file is saved in the Downloads folder)
- Click the **OUTPUT DATA** tab to view the dataset that was created
- Select the desired data set from the **Table** pull-down menu on the toolbar
- Click the **CODE** tab and introduce some mistakes in the program by removing some semicolons
- Run the program and use navigation in the log to find error messages
Some Hands-On Examples of the Editor (Cont.)

- **View Submission History**
  - Click the Submission history icon on the toolbar of the Code tab
  - Choose an earlier version of the program to view a read-only copy of submitted code

- **Submit Background Job**
  - From the Files and Folders section of the navigation pane, right-click the program file to submit and select Background submit
  - Check its status by clicking the More application options icon and selecting Background Job status
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PROC SQL;
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RUN;
QUIT;
PROC DATASETS NOLIST NODATE;
   CONTENTS DATA=WORK.query OUT=WORK.details;
RUN;
PROC PRINT DATA=WORK.details;
RUN;
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