

Introduction to SAS

SAS Studio 3.2

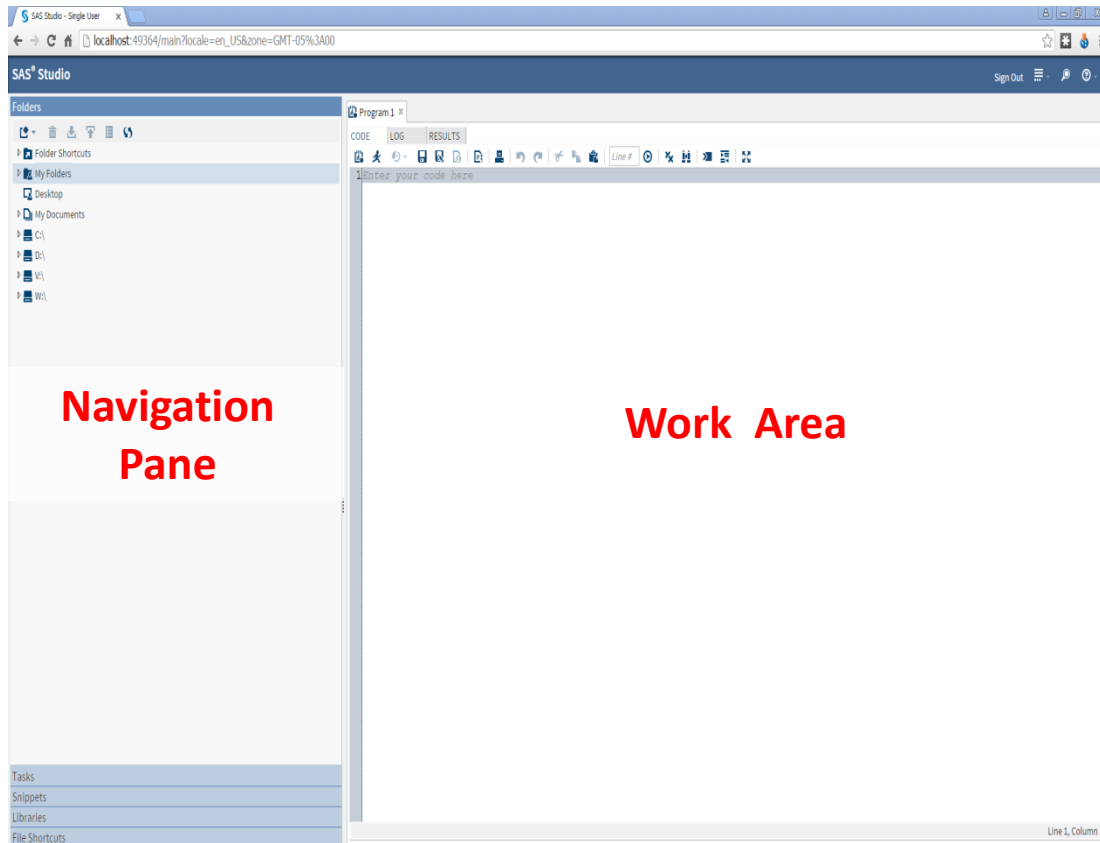


By Maya Pham

Agenda

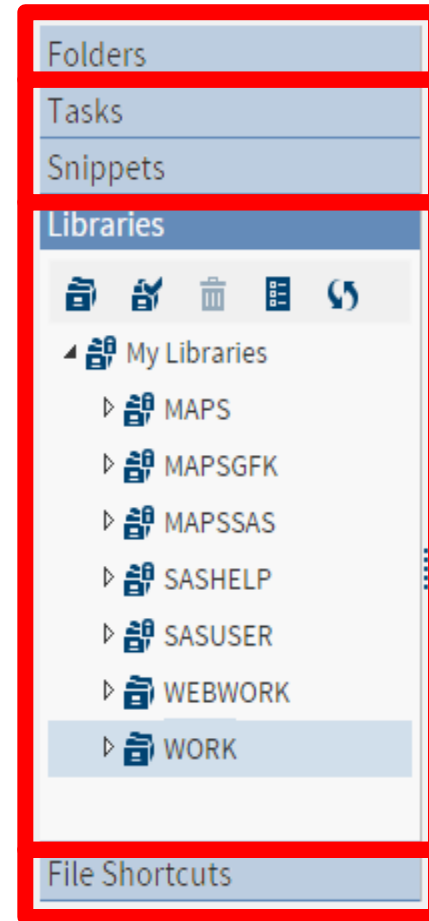
- Why use SAS?
- SAS Studio interface, libraries, and syntax structure
- Practice to import data, run some analysis, create new variable and plots.
- Look for SAS help

SAS Studio



**Navigation
Pane**

Work Area



Browse files

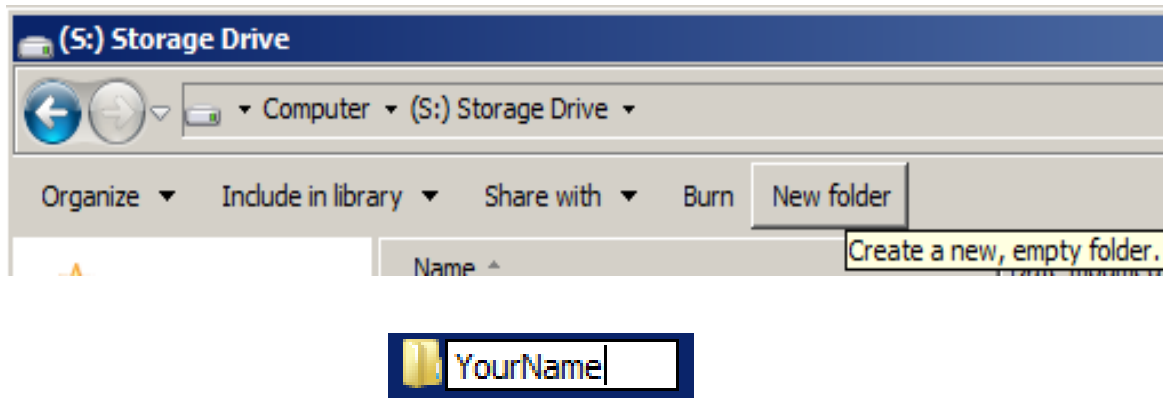
Templates

SAS folders

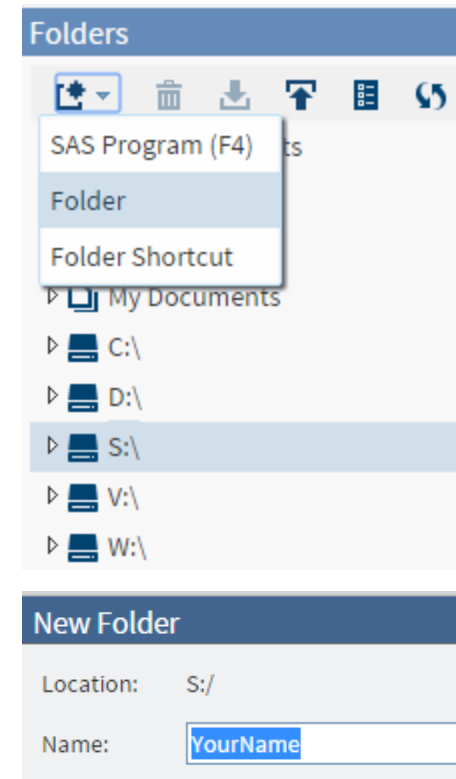
Quick access

Create New Folder in S Drive

- Use Window Explorer



- Use SAS Studio



- Go back to SAS Studio.

Create New Library

The image shows the SAS Libraries panel and the 'New Library' dialog box. The Libraries panel on the left shows a list of libraries: MAPS, MAPSGFK, MAPSSAS, SASHELP, SASUSER, WEBWORK, and WORK. The 'New Library' dialog box in the center has the following fields: Name: mylib, Path: S:\myFolder, and Options: LIBNAME options (separated by spaces). The 'Re-create this library at start-up' checkbox is unchecked. The Libraries panel on the right shows the same list of libraries, with 'MYLIB' highlighted in blue. A red box highlights the 'New Library' button in the top-left panel, and another red box highlights the 'MYLIB' entry in the right panel. The text 'Permanent' is written in red to the right of the 'MYLIB' entry, and 'Temporary' is written in red to the right of the 'WORK' entry.

Libraries

My Libraries

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

New Library

To create a library for this session, specify these values:

Name: mylib

Path: S:\myFolder

Options: LIBNAME options (separated by spaces)

Re-create this library at start-up
(adds the library to the SAS autoexec file)

OK Cancel

Libraries

My Libraries

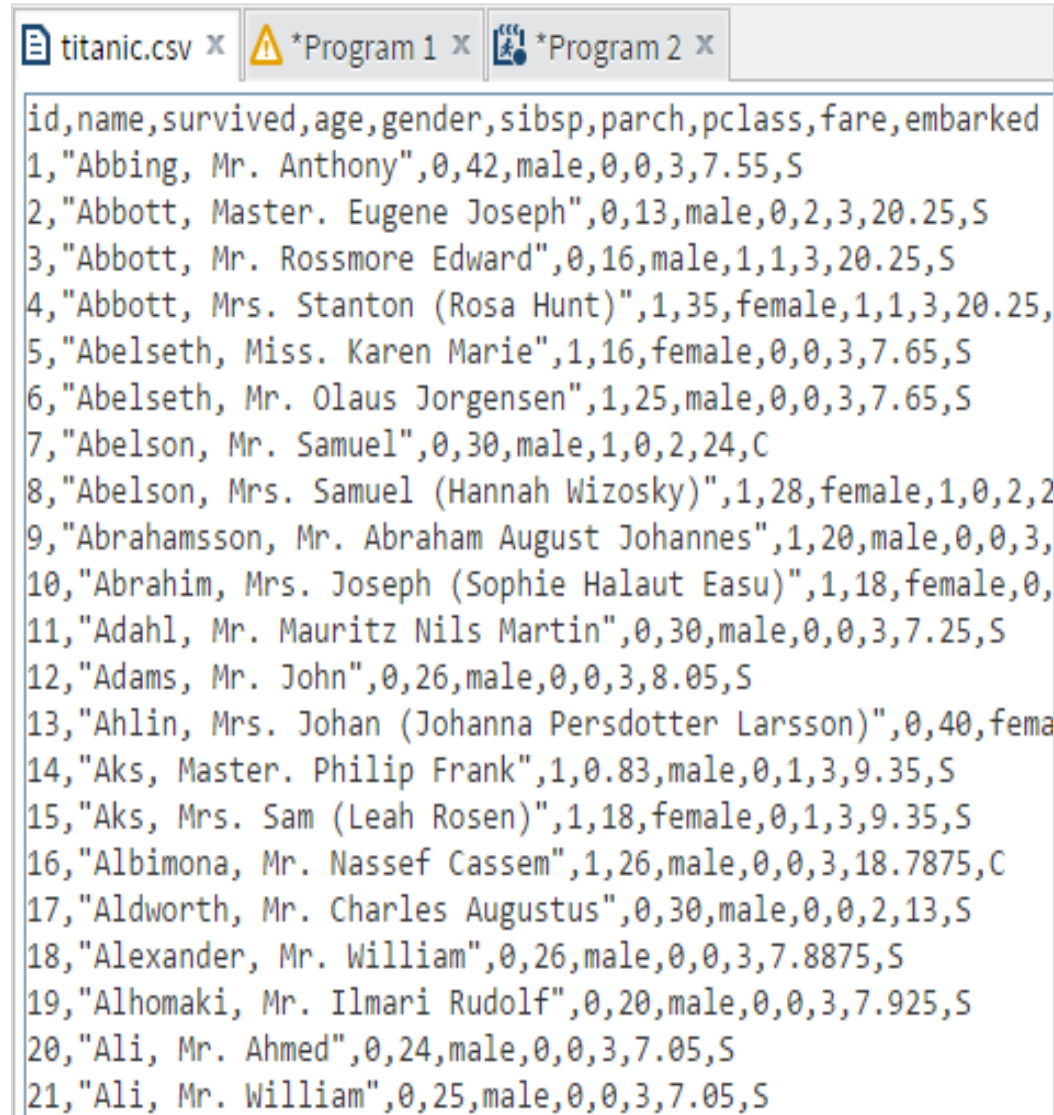
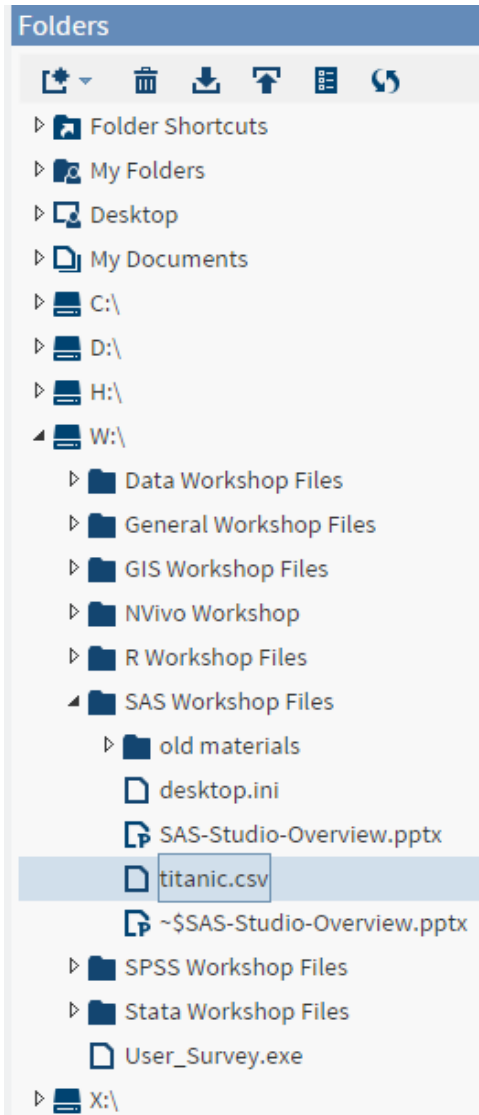
- MAPS
- MAPSGFK
- MAPSSAS
- MYLIB
- SASHELP
- SASUSER
- WEBWORK
- WORK

Permanent

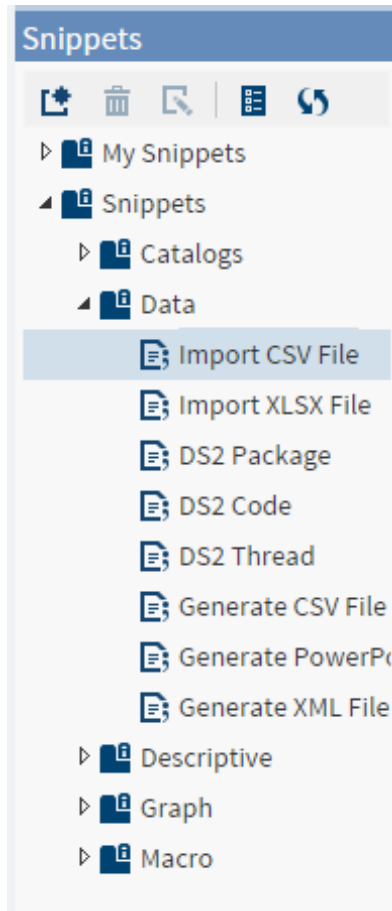
Temporary

```
LIBNAME mylib 'S:\myFolder' ;
```

View CSV Data File



Import CSV File With Snippet



```
/** FOR CSV Files uploaded from Windows **/
```

```
FILENAME CSV "W:\SAS Workshop Files\titanic.csv" termstr= crlf;
```

```
/** Import the CSV file. **/
```

```
PROC IMPORT DATAFILE= CSV  
            OUT= mylib.titanic  
            DBMS= CSV  
            REPLACE;
```

```
RUN;
```

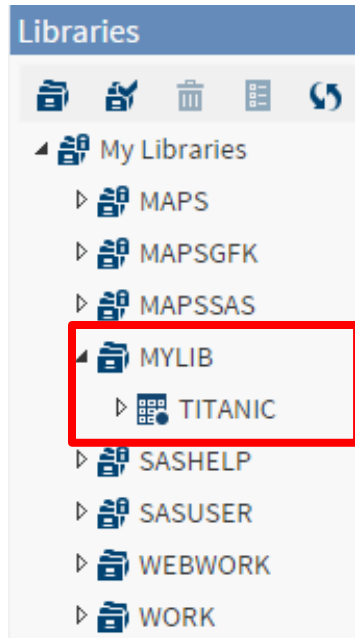
```
/** Print the results and data structure **/
```

```
PROC PRINT DATA = mylib.titanic ; RUN ;  
PROC CONTENTS DATA = mylib.titanic ; RUN ;
```

- To execute, select the entire code and hit F3.

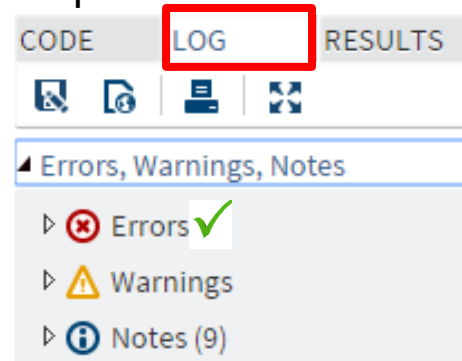
View Data Table

Step 1



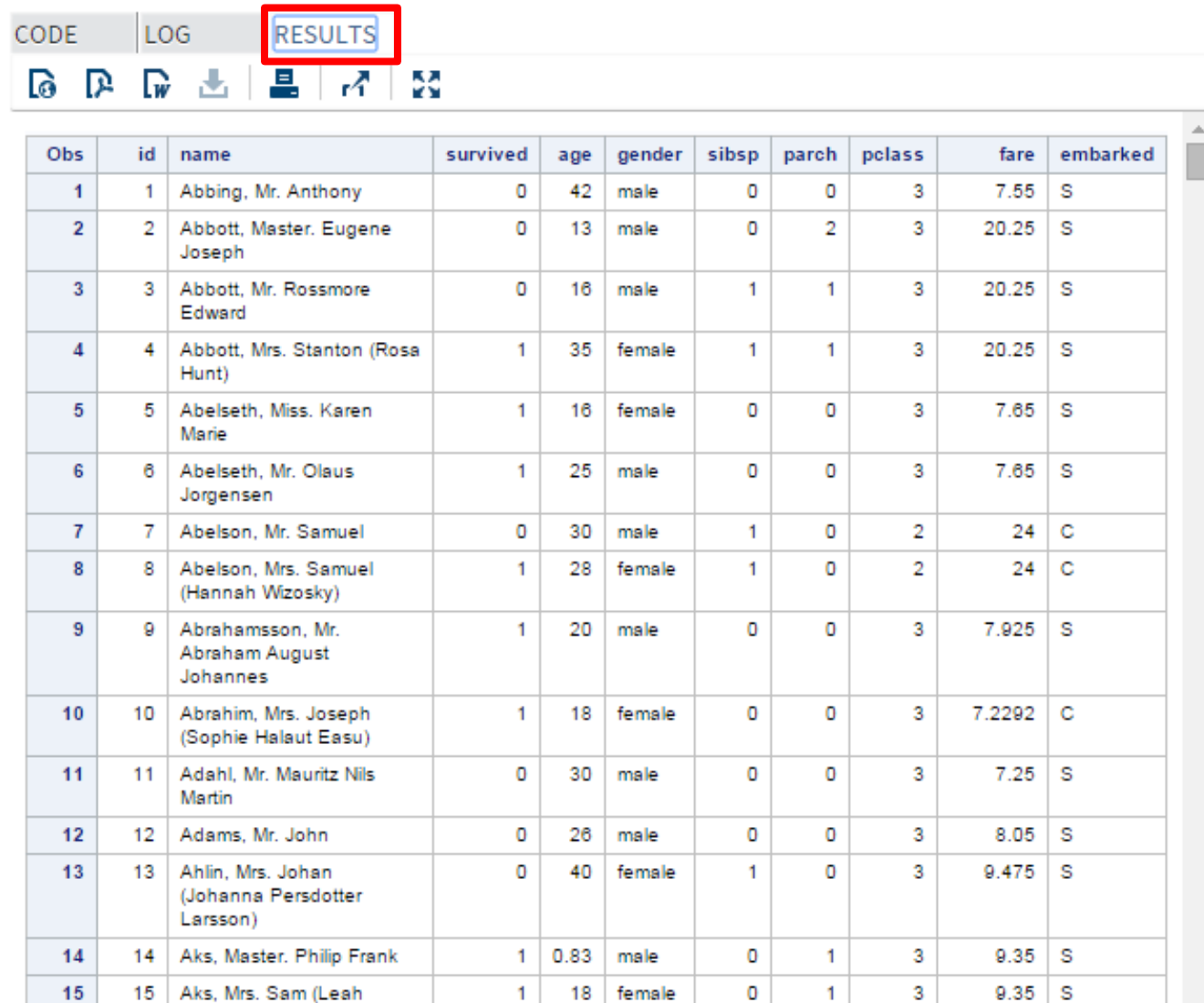
The screenshot shows the 'Libraries' panel in SAS. The 'MYLIB' library is highlighted with a red box, and the 'TITANIC' dataset is visible below it. Other libraries listed include MAPS, MAPSGFK, MAPSSAS, SASHELP, SASUSER, WEBWORK, and WORK.

Step 2



The screenshot shows the top of the SAS interface. The 'LOG' tab is selected and highlighted with a red box. Below the tabs, there is a section for 'Errors, Warnings, Notes' with sub-items: Errors (with a green checkmark), Warnings, and Notes (9).

Step 3



The screenshot shows the SAS interface with the 'RESULTS' tab selected and highlighted with a red box. Below the tabs, there is a data table with 15 rows and 11 columns. The columns are: Obs, id, name, survived, age, gender, sibsp, parch, pclass, fare, and embarked.

Obs	id	name	survived	age	gender	sibsp	parch	pclass	fare	embarked
1	1	Abbing, Mr. Anthony	0	42	male	0	0	3	7.55	S
2	2	Abbott, Master. Eugene Joseph	0	13	male	0	2	3	20.25	S
3	3	Abbott, Mr. Rossmore Edward	0	16	male	1	1	3	20.25	S
4	4	Abbott, Mrs. Stanton (Rosa Hunt)	1	35	female	1	1	3	20.25	S
5	5	Abelseth, Miss. Karen Marie	1	16	female	0	0	3	7.65	S
6	6	Abelseth, Mr. Olaus Jorgensen	1	25	male	0	0	3	7.65	S
7	7	Abelson, Mr. Samuel	0	30	male	1	0	2	24	C
8	8	Abelson, Mrs. Samuel (Hannah Wizosky)	1	28	female	1	0	2	24	C
9	9	Abrahamsson, Mr. Abraham August Johannes	1	20	male	0	0	3	7.925	S
10	10	Abraham, Mrs. Joseph (Sophie Halaut Easu)	1	18	female	0	0	3	7.2292	C
11	11	Adahl, Mr. Mauritz Nils Martin	0	30	male	0	0	3	7.25	S
12	12	Adams, Mr. John	0	26	male	0	0	3	8.05	S
13	13	Ahlin, Mrs. Johan (Johanna Persdotter Larsson)	0	40	female	1	0	3	9.475	S
14	14	Aks, Master. Philip Frank	1	0.83	male	0	1	3	9.35	S
15	15	Aks, Mrs. Sam (Leah	1	18	female	0	1	3	9.35	S

Variable Types

MYLIB.TITANIC x

View: Column names Filter: (none)

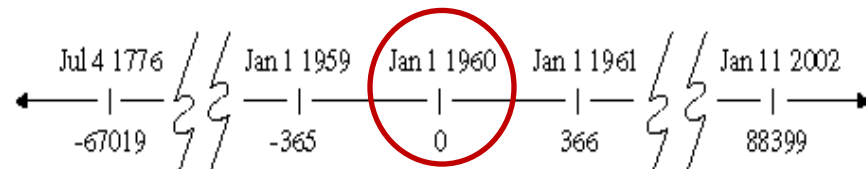
Columns	Total rows: 1309 Total columns: 10	
	id	name
<input checked="" type="checkbox"/> Select all		
<input checked="" type="checkbox"/> 123 id	1	Abbing, Mr. Anthony
<input checked="" type="checkbox"/> A name	2	Abbott, Master. Eugene Joseph
<input checked="" type="checkbox"/> 123 survived	3	Abbott, Mr. Rossmore Edward
<input checked="" type="checkbox"/> 123 age	4	Abbott, Mrs. Stanton (Rosa Hunt)
<input checked="" type="checkbox"/> A gender	5	Abelseth, Miss. Karen Marie
<input checked="" type="checkbox"/> 123 sibsp	6	Abelseth, Mr. Olaus Jorgensen
<input checked="" type="checkbox"/> 123 parch	7	Abelson, Mr. Samuel
<input checked="" type="checkbox"/> 123 pclass	8	Abelson, Mrs. Samuel (Hannah Wizosky)
<input checked="" type="checkbox"/> 123 fare	9	Abrahamsson, Mr. Abraham August Johannes
<input checked="" type="checkbox"/> A embarked	10	Abraham, Mrs. Joseph (Sophie Halaut Easu)
	11	Adahl, Mr. Mauritz Nils Martin

Property	Value
Label:	id
Name	id
Length:	8
Type:	Numeric
Format:	BEST12.
Informat:	BEST32.

Property	Value
Label:	gender
Name	gender
Length:	6
Type:	Char
Format:	\$6.
Informat:	\$6.

Calendar Date (Numeric)

```
PROC CONTENTS DATA=titanic1;
RUN;
```



Common Charts

- Using templates in Tasks pane

The screenshot shows the SAS software interface. On the left, the 'Tasks' pane is open, displaying a tree view with 'My Tasks', 'Tasks', 'Data', 'Econometrics', and 'Graph' (selected). Under 'Graph', several chart types are listed: Bar Chart, Bar-Line Chart, Box Plot, Histogram, Line Chart, Pie Chart, Scatter Plot, Series Plot, and Simple HBar. On the right, the 'Bar Chart' configuration window is open, showing the 'DATA' tab. The 'DATA' dropdown is set to 'WORK.TITANIC2'. The 'ROLES' section is expanded, showing 'Category variable: (1 item)' set to 'pclass', 'Response variable: (1 item)' set to 'Column', 'Group variable: (1 item)' set to 'survived', 'URL variable: (1 item)' set to 'Column', and 'BY variable: (1 item)' set to 'Column'. The 'DIRECTION', 'GROUP LAYOUT', and 'STATISTICS' sections are also visible.

- Auto-code generation

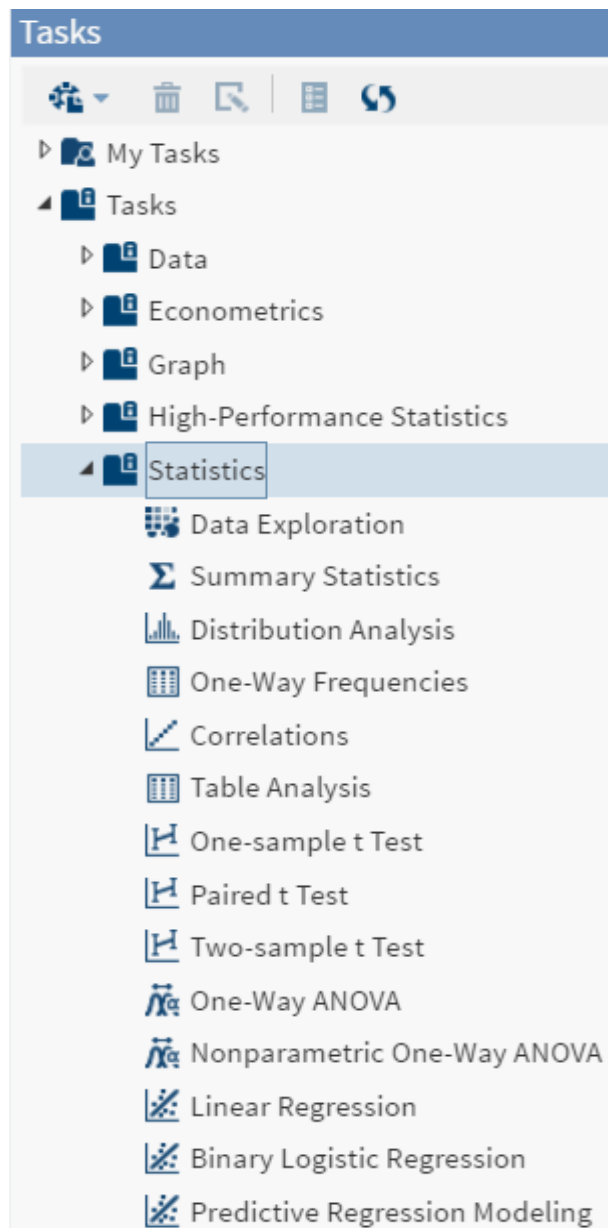
1) Bar Chart

```
PROC SGPLOT DATA=mylib.titanic ;  
    VBAR pclass / GROUP = survived ;  
RUN ;
```

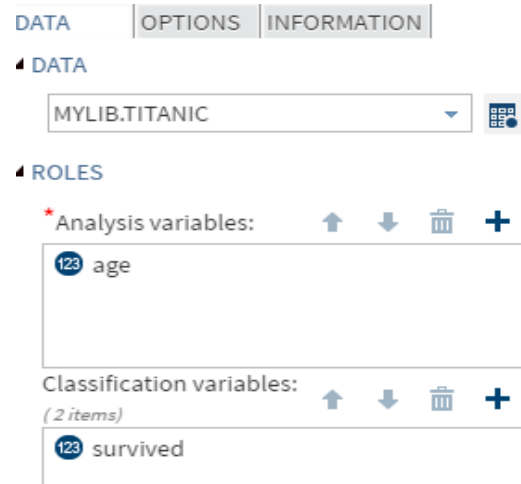
2) Histogram

```
PROC SGPLOT DATA=mylib.titanic ;  
    HISTOGRAM age ;  
RUN ;  
QUIT;
```

Common Statistical Analysis



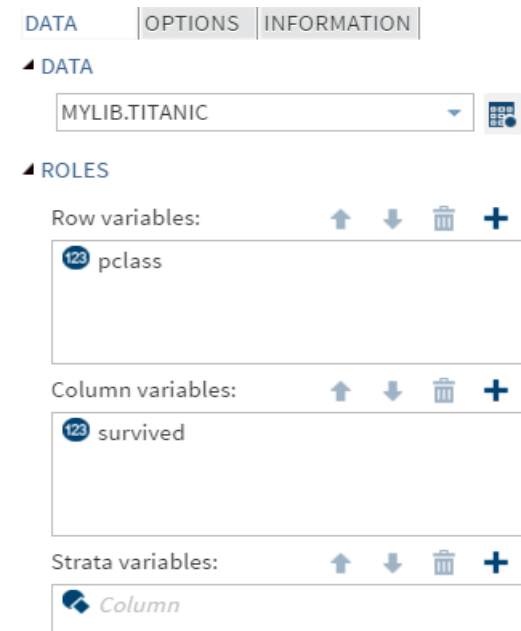
The screenshot shows the SAS 'Tasks' menu. The 'Statistics' option is selected and highlighted. Below it, various statistical tasks are listed, including Data Exploration, Summary Statistics, Distribution Analysis, One-Way Frequencies, Correlations, Table Analysis, One-sample t Test, Paired t Test, Two-sample t Test, One-Way ANOVA, Nonparametric One-Way ANOVA, Linear Regression, Binary Logistic Regression, and Predictive Regression Modeling.



The screenshot shows the SAS PROC MEANS dialog box. The 'DATA' tab is selected, and the data source is set to 'MYLIB.TITANIC'. Under the 'ROLES' section, 'age' is listed as an analysis variable, and 'survived' is listed as a classification variable.

1) Summary Statistics

```
PROC MEANS DATA=mylib.titanic  
  chartype mean std min  
  max n vardef=df ;  
VAR age ;  
CLASS survived ;  
RUN ;
```



The screenshot shows the SAS PROC FREQ dialog box. The 'DATA' tab is selected, and the data source is set to 'MYLIB.TITANIC'. Under the 'ROLES' section, 'pclass' is listed as a row variable, and 'survived' is listed as a column variable.

2) Table Analysis

```
PROC FREQ DATA=mylib.titanic  
  noprint ;  
TABLES (pclass)*(survived) /  
  chisq nopercnt norow  
  nocol nocum  
  plots(only)=(freqplot  
  mosaicplot) ;  
RUN ;
```

Syntax Structure

To open new Program window: press **F4** or use Folder pane

DATA working-dataset <options>;

- Create dataset
- Read and transform data

PROC command DATA= working-dataset <options>;

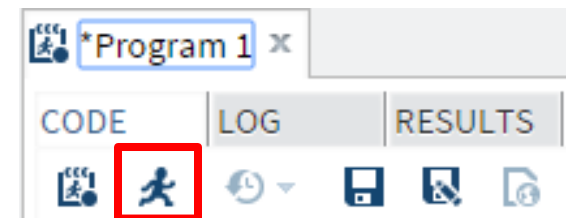
- Analyze data
- Create reports and graphs

RUN;

- Execute
- Click SUBMIT  on the menu bar or **F3**

COMMENT

- Not executable
- Has special character: `*example1 /*example2*/`
- **Ctrl+/**** to make or remove a comment



Autocomplete

Help with SAS syntax

The screenshot shows the SAS Preferences dialog box. The 'Editor' tab is selected. The 'Enable autocomplete' checkbox is checked and highlighted with a red box. Other options include 'Enable hint', 'Substitute spaces for tabs', 'Enable color coding', 'Show line numbers', 'Enable autosave', and 'Autosave Interval' set to 30 seconds. A 'Reset to Defaults' button is at the bottom right, and 'Save' and 'Cancel' buttons are at the bottom.

The screenshot shows the SAS IDE interface. The 'LOG' window is open, showing 'Errors, Warnings, Notes' and a sub-section for 'Errors'. A red arrow points from the 'LOG' window to the 'Check log' text. The 'CODE' window is also open, showing the 'DATA' keyword. An autocomplete popup is visible, displaying 'Global Statements' and 'DATA' with a detailed description: 'Keyword: DATA', 'Context: [GLOBAL STATEMENT] DATA statement', 'Begins a DATA step and provides names for any', 'Syntax: (1) DATA <data-set-name-1 <(data-set-options-: <... data-set-name-n <(data-set-options-n)>>', and a scrollable list of options.

Manage Data Files

- Copy data from SET **A** to DATA **B**

```
DATA titanic1 ;  
    SET mylib.titanic ;  
RUN ;
```

```
DATA work.titanic2 ;  
    SET mylib.titanic ;  
RUN ;
```

```
DATA mylib.titanic1 ;  
    SET mylib.titanic ;  
RUN ;
```

- Check Libraries



WORK
TITANIC1



WORK
TITANIC1
TITANIC2



MYLIB
TITANIC
TITANIC1

Data Manipulation

- Generate descriptive statistics with distribution chart

```
PROC UNIVARIATE DATA = titanic1 ;
```

```
    VAR age ;
```

```
    HISTOGRAM ;
```

```
RUN ;
```

- Create a new variable, named YOUTH

```
DATA titanic2 ;
```

```
    SET titanic1 ;
```

```
    IF age < 16 THEN youth=1 ;
```

```
    IF 16 <= age < 99 THEN youth=0 ;
```

```
    IF age = 99 THEN youth=.a ;
```

```
RUN ;
```



New values
→ Missing value

Crosstabulation / Table Analysis

```
PROC FREQ DATA = titanic2 ;  
    TABLES youth survived ;  
    TABLES youth * survived  
            /NOPERCENT CHISQ NOCOL ;  
    TABLES youth * pclass * survived ;  
RUN ;
```

```
PROC TABULATE DATA = titanic2 ;  
    CLASS pclass gender ;  
    VAR age ;  
    TABLE pclass ALL ,  
           age * gender * (N MEAN) ;  
RUN ;
```

→ Row label

→ Column label

Save Files

- Save SAS Data File as ***.sas7bdat**

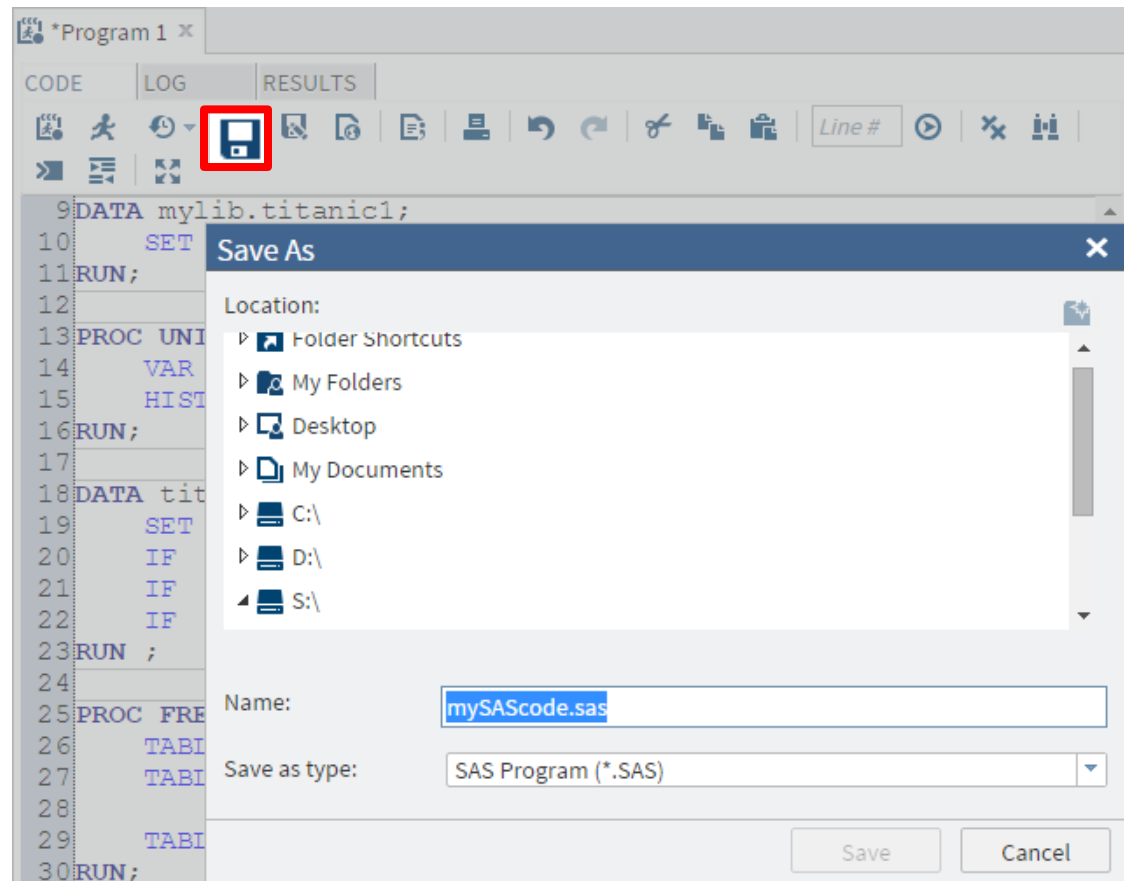
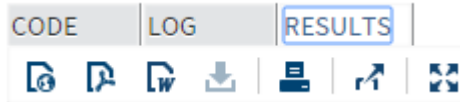
```
DATA mylib.titanic1;
```

```
    SET titanic2;
```

```
RUN;
```

- Save SAS Syntax File as ***.sas**

- Save output files as HTML, PDF, Word



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SAS

SAS is statistical software created by large organizations, including management and analysis. SAS is when working with very large data powerful computer to do so. Although powerful, the syntax is difficult to intend to work at one of the public extremely large data sets might cor

Resources from **SAS Institute, Inc.**

- [Free SAS software \(University Edition\)](#)
- [SAS Support](#)
 - Get all information about SAS installation, updates, resources, trainings, and etc.
- [SAS Documentation](#)
 - Look up index of all SAS procedures in most recent versions
- [SAS Forums "Support Communities with online Q&A"](#)
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