

SAS EG Tips and Tricks from a Statistical Programmer's Perspective

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ABSTRACT

SAS® is one of the most widely used tools in the clinical research industry, particularly by statistical programmers responsible for generating datasets and outputs used in regulatory submissions. While SAS® Enterprise Guide® offers a rich graphical interface and productivity features, many users underutilize its full capabilities in daily programming. This paper presents key tips and tricks within SAS® Enterprise Guide®(EG) that help programmers work more efficiently and take full advantage of the platform. Topics include Increasing the number of visible output datasets, displaying full dataset paths, Using Query Builder, stacking datasets without manual coding, creating abbreviation macros for repetitive tasks, Leveraging keyboard shortcuts in SAS® Enterprise Guide®(EG) and other useful methods. This paper intends to serve as a quick reference guide for programmers looking to optimize their use of SAS® Enterprise Guide®(EG). Whether new or experienced, users will find value in these practical approaches to maximize productivity.

INTRODUCTION

SAS® Enterprise Guide® (EG) is a versatile tool that empowers statistical programmers to streamline workflows and enhance productivity. While its graphical interface simplifies many tasks, there are numerous features and options that, when used effectively, can significantly improve efficiency, accuracy, and consistency in programming. This paper highlights practical tips and tricks from a statistical programmer's perspective, covering everything from optimizing dataset views and managing output tables to leveraging macros and shortcuts. These insights aim to help programmers navigate complex projects with ease, reduce manual effort, and maintain high standards of data integrity and traceability.

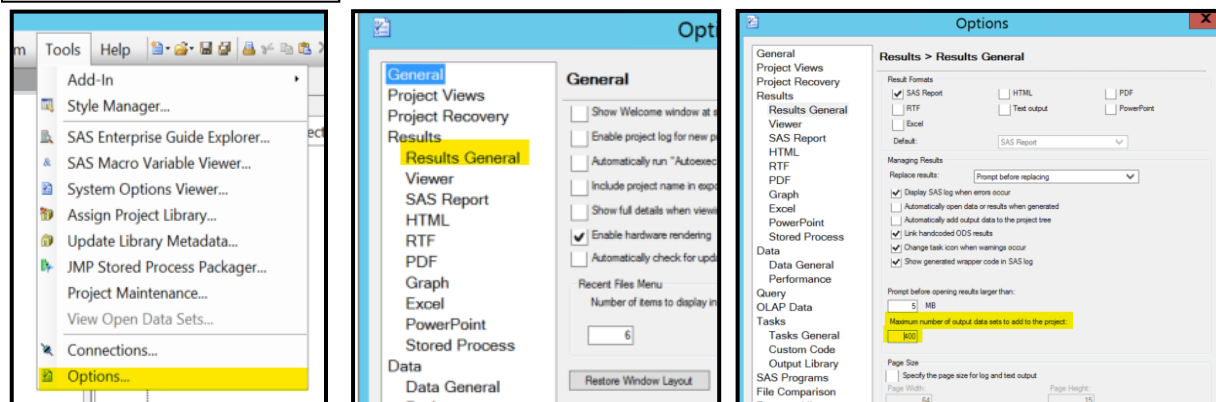
INCREASE THE NUMBER OF OUTPUT DATASETS

By default, SAS® Enterprise Guide® (EG) displays a maximum of 50 output datasets at a time. When working with complex or extensive programs, it is common to generate a substantially larger number of datasets, which cannot all be viewed simultaneously. In such scenarios, users often resort to navigating the Work library and reviewing each dataset individually, a process that is both time-consuming and prone to confusion. This limitation can be overcome by increasing the maximum number of output datasets displayed within the SAS® EG window. The steps below outline how to implement this adjustment.

Click on '**Tools**' in SAS® EG toolbar and select '**Options**'

Click on '**Results General**' in the '**Options**' window

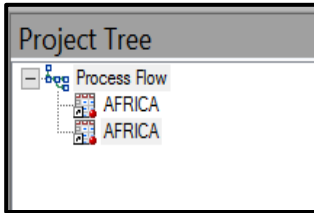
In '**Results General**' update the maximum number of datasets as you may need



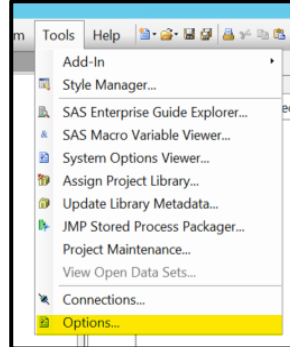
DISPLAYING FULL PATH OF THE DATASET

In SAS® Enterprise Guide® (EG), datasets show their names by default without the library reference. This can lead to confusion when several libraries have datasets with the same names, like AFRICA in both the MAPS and MAPSGFK libraries. In these situations, it can be hard to tell which dataset is being used, raising the chance of errors during analysis. To solve this, SAS® EG offers an option to show the full library path next to the dataset name, such as MAPS.AFRICA or MAPSGFK.AFRICA. Turning on this setting is especially helpful for complex projects with multiple libraries. It ensures clarity and reduces the chances of misunderstandings. The following steps explain how to enable this option.

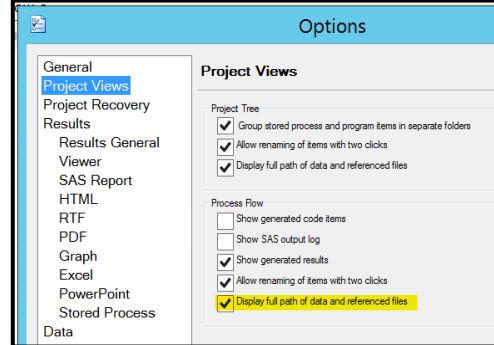
Before implementation



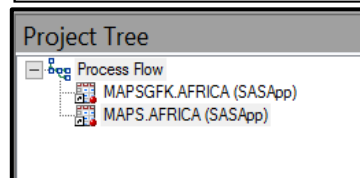
Click on 'Tools' in SAS® EG toolbar and select 'Options'



In 'Project Views' you will see the following line 'Display full path of data and referenced files' check this box



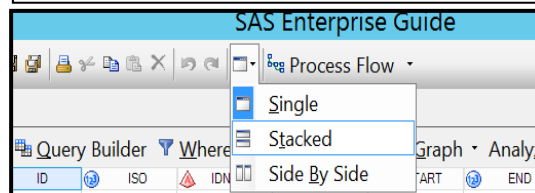
After implementation



'STACKED' OR 'SIDE BY SIDE' DATASETS VIEW OPTIONS

In SAS® Enterprise Guide® (EG), the "Stacked" and "Side-by-Side" options in the Results toolbar decide how multiple datasets are shown in the workspace. The "Stacked" option arranges all datasets vertically in one scrolling view. This setup makes it easier to review results in order without switching tabs. It is helpful for comparing datasets from different steps in a continuous flow. On the other hand, the "Side-by-Side" option splits the window horizontally or vertically. This allows two datasets to be seen at the same time. This layout is especially useful when comparing datasets, logs, or graphs in real time. It cuts down the need to toggle between views. Choosing between these options depends on the complexity of the analysis and the user's preference for navigation and comparison. You can use these options by following the steps below.

Click on 'Workspace Layout' in the SAS® EG toolbar. Choose the required option



Now we can open two different datasets in the same screen which become easy to compare and understand the data

CONT	ID	SEGMENT	DENSITY
41	95	110	1
42	95	110	1
43	95	110	1
44	95	110	1
45	95	110	1
46	95	110	1

CONT	ID	ISO	IDNAME
1	95	110	004 AFGHANISTAN
2	95	181	048 SAUDI ARABIA
3	95	182	050 BANGLADESH
4	95	200	064 BHUTAN
5	95	228	086 BRITISH INDIA
6	95	232	096 BRUNEI

Stacked view

CONT	ID	ISO	IDNAME
41	95	110	1
42	95	110	1
43	95	110	1
44	95	110	1
45	95	110	1
46	95	110	1

ID	ISO	IDNAME
1	110	004 AFGHANISTAN
2	181	048 SAUDI ARABIA
3	182	050 BANGLADESH
4	200	064 BHUTAN
5	228	086 BRITISH INDIA
6	232	096 BRUNEI
7	250	104 MYANMAR
8	255	116 CAMBODIA
9	272	144 SRI LANKA
10	280	156 CHINA
11	281	158 TAIWAN
12	305	196 CYPRUS
13	383	275 GAZA STRIP

Side-By-Side view

'SELECT DISTINCT ROWS' OPTION IN QUERY BUILDER

In Query Builder the 'Select Distinct Rows' option in SAS® Enterprise Guide (EG) is useful for understanding data better. It helps to quickly identify unique combinations of key variables, which helps in detecting duplicates, validating data integrity. By reducing redundancy, it provides a clearer view of the underlying patterns and distributions of data, making the analysis and subsequent programming steps more efficient and accurate. To use this option in SAS® EG, follow steps as shown below.

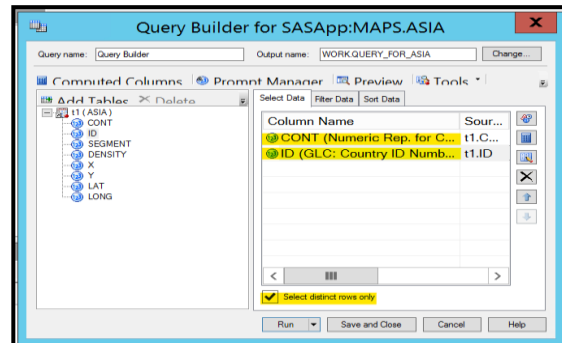
Open the dataset you want to analyze, you will see an option called 'Query Builder' in the Data Grid Toolbar, click on this option

ASIA

Filter and Sort Query Builder Where Data Describe

	CONT	ID	SEGMENT
1	95	110	1
2	95	110	1
3	95	110	1

The below pop-up window opens; we can choose the variables for which we need distinct rows and check the box for 'Select distinct rows'



ASIA

Filter and Sort Query Builder Where Data Describe Graph Analyze Export

	CONT	ID	SEGMENT	DENSITY	X	Y	LAT	LONG
1	95	110	1	4	0.3399016	-2.609042206	0.5947161123	-1.056030895
2	95	110	1	6	0.3397611217	-2.609787942	0.593988907	-1.056224781
3	95	110	1	6	0.3388052554	-2.61216605	0.591569652	-1.0565584
4	95	110	1	6	0.3384713501	-2.613196602	0.59056392	-1.05635631
5	95	110	1	3	0.3382942011	-2.6139824	0.590153992	-1.056869582
6	95	110	1	4	0.3379308861	-2.61400821	0.589632462	-1.056719268
7	95	110	1	3	0.3370647408	-2.614471334	0.5888595444	-1.056016291
8	95	110	1	6	0.336589577	-2.615697708	0.5876232696	-1.056234477
9	95	110	1	1	0.3365007166	-2.616152753	0.5872014811	-1.056408995
10	95	110	1	5	0.33659321	-2.616575661	0.5868718129	-1.05728982
11	95	110	1	4	0.336733519	-2.616961204	0.5866245426	-1.057155633
12	95	110	1	6	0.3369649352	-2.617434253	0.586328214	-1.057598639
13	95	110	1	6	0.3372128805	-2.617731416	0.5861882169	-1.058154324
14	95	110	1	3	0.3375182775	-2.618277461	0.5859634007	-1.058233381
15	95	110	1	5	0.3379832878	-2.618687908	0.58572279	-1.059589383
16	95	110	1	5	0.338861826	-2.619095205	0.5857664325	-1.060815985

The below dataset is the output from query builder which displays the distinct rows based on the variables provided

Query Builder

Input Data Code Log Output

Modify Task Filter and

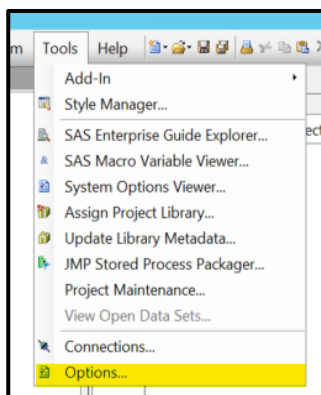
	CONT	ID
1	95	110
2	95	181
3	95	182
4	95	200
5	95	228
6	95	232

Screenshot of the data being used

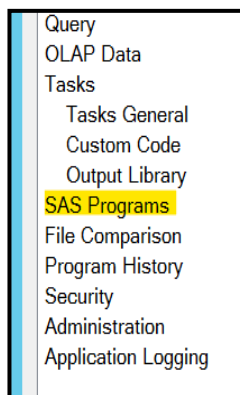
ADDING LINE NUMBERS TO PROGRAM

Enabling line numbers in SAS® Enterprise Guide®(EG) is important for clarity and precision when reviewing or debugging code for programmers. Line numbers make it easier to locate specific sections of a program, reference errors reported in the log and communicate code changes with team members. This feature is particularly useful in large programs where quick navigation and accurate identification of problematic statements are essential for efficient troubleshooting and maintaining code quality. If you want to add line numbers to you Code Editor follow the steps as shown below.

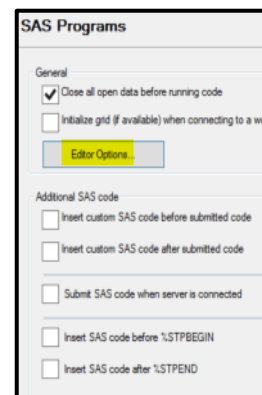
Click on 'Tools' in toolbar and select 'Options'



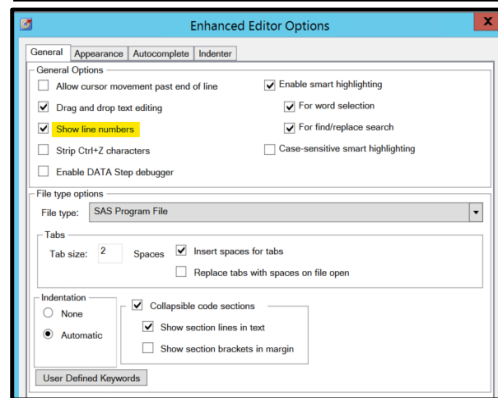
Click on 'SAS Programs' option



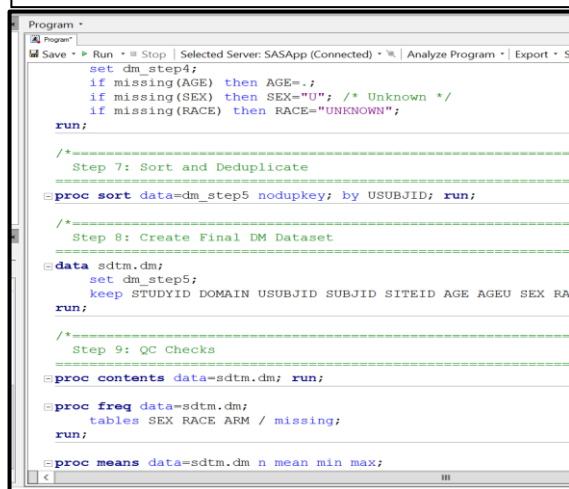
Click on the 'Editor Options...' option



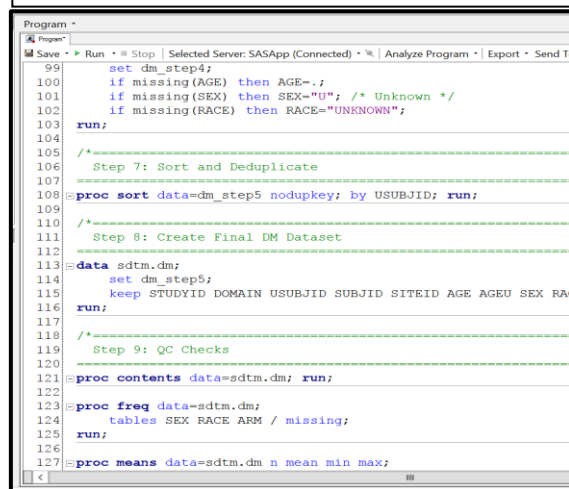
'Enhanced Editor Options' opens check the box corresponding to the line 'Show line numbers'



Program before adding line numbers



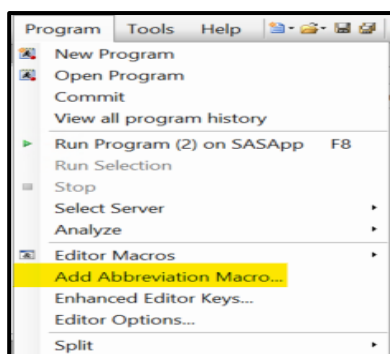
Program after adding line numbers



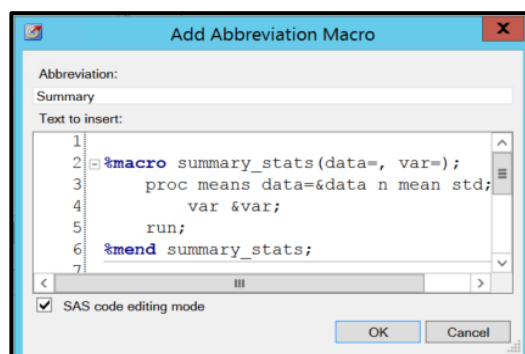
ADD ABBREVIATION MACRO

Adding an abbreviation macro in SAS® Enterprise Guide® (EG) is a valuable practice for enhancing coding efficiency and consistency. By defining short, reusable references for commonly used terms, variable names, or code snippets, you can significantly reduce typing effort and minimize the risk of errors. This approach promotes uniformity across programs, accelerates development and maintainability particularly when working with large clinical datasets or performing repetitive tasks. To utilize the 'Add Abbreviation Macro' follow the below steps.

Click on Program and in the drop down select 'Add Abbreviation Macro...' option

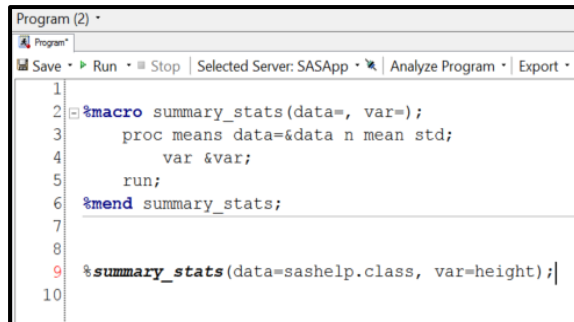
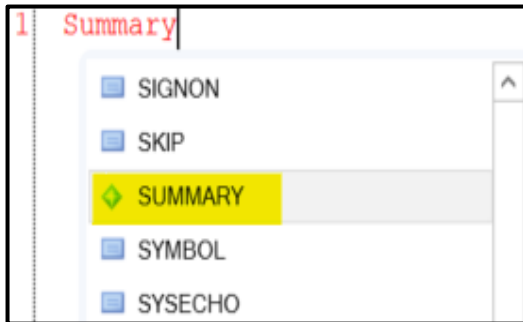


Under 'Abbreviation' the key word can be added. In the 'Text to insert' section the code that is required can be added, once done click on 'OK'



When required if the key word is typed out a drop down will be seen as shown below, if we select the option with the green mark the code we had inserted will auto populate

The below is auto populated code or text required

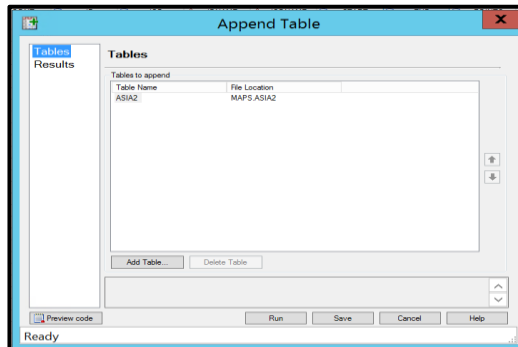
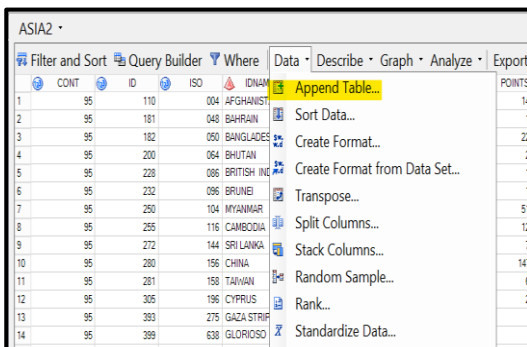


STACK DATASETS USING APPEND TABLE OPTION

The Append Tables option in SAS® Enterprise Guide® (EG) is an efficient way to stack datasets that share the same structure. It allows you to stack multiple datasets vertically into a single consolidated dataset without writing manual code. This feature is particularly useful when merging data from different sources, study periods, or batches. By ensuring consistency and reducing processing time, it simplifies data preparation, accelerates analysis, and helps maintain traceability an essential aspect of clinical programming workflows. Follow the below shown steps to use 'Append Table' option.

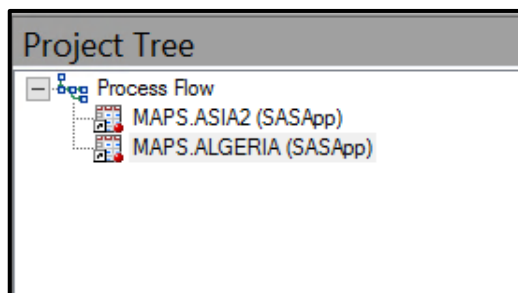
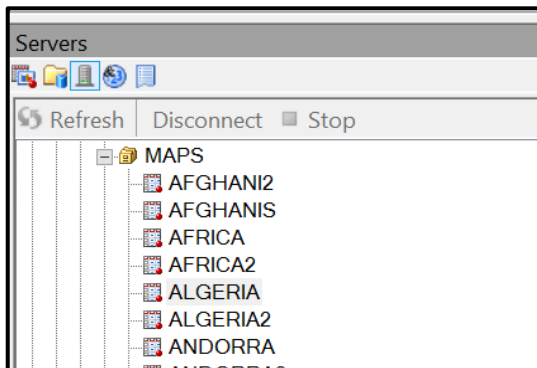
Now select the 'Data' option from the Data Grid Toolbar

You will see the below Window pop up. Which shows the already selected dataset and give an option to add additional tables for appending

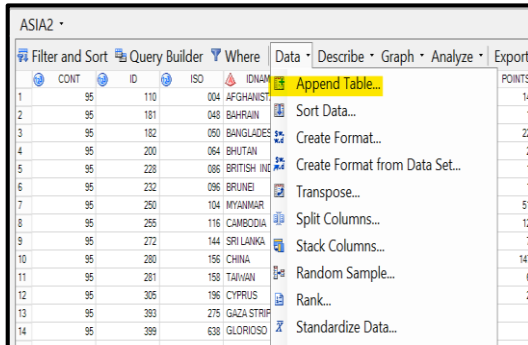


From the respective server select and open the required datasets for stacking.

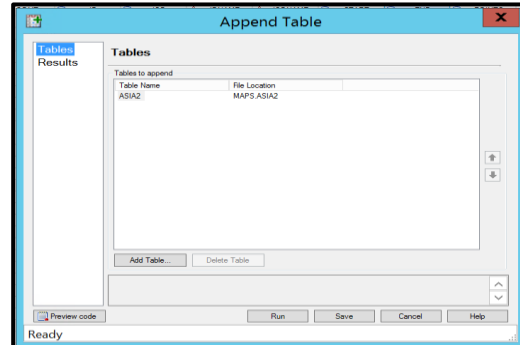
From the 'Project Tree' section open one of the required datasets.



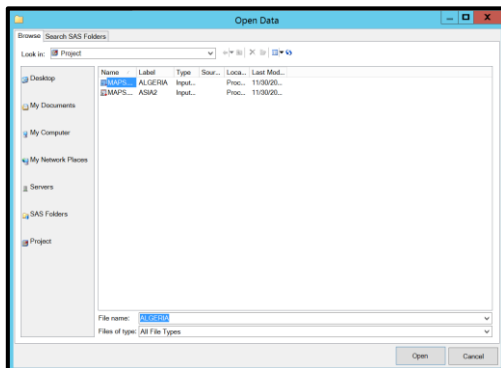
Now select the **'Data'** option from the Data Grid Toolbar



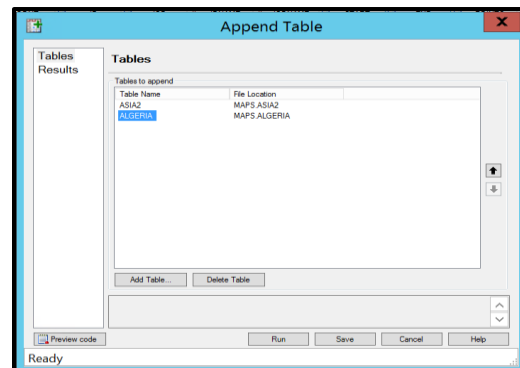
You will see the below Window pop up. Which shows the already selected dataset and give an option to add additional tables for appending



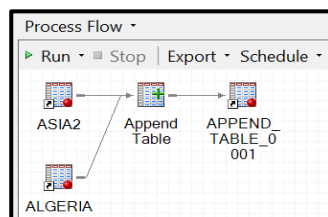
Once we select the option **'Add tables'** then the file browse widow opens this shows us the list of datasets in our current project tree. Select the other datasets required to append.



Once we see the required datasets in the **'Append Table'** window, select the run option



Once the run is complete, the new Appended Table is displayed



Workflow

The screenshot shows the final SAS Data Grid after the append operation. The table now includes data from both 'ASIA2' and 'ALGERIA'. The columns are: CONT, ID, ISO, IDNAME, ISONAME, START, and END. The data is sorted by CONT and ID.

	CONT	ID	ISO	IDNAME	ISONAME	START	END
1	95	110	004	AFGHANISTAN	AFGHANISTAN	1	1456
2	95	181	048	BAHRAIN	BAHRAIN	1457	1584
3	95	182	050	BANGLADESH	BANGLADESH	1585	3867
4	95	200	064	BHUTAN	BHUTAN	3868	4159
5	95	228	086	BRITISH INDIA	BRITISH INDIA	4160	4320
6	95	232	096	BRUNEI	BRUNEI DARU	4321	4482
7	95	250	104	MYANMAR	MYANMAR	4483	9648
8	95	255	116	CAMBODIA	CAMBODIA	9649	10852
9	95	272	144	SRI LANKA	SRI LANKA	10853	11640
10	95	280	156	CHINA	CHINA	11641	26405
11	95	281	158	TAIWAN	TAIWAN, PRO.	26406	27044
12	95	305	196	CYPRUS	CYPRUS	27045	27270
13	95	393	275	GAZA STRIP	PALESTINIAN	27271	27291

QUICK SAS SHORCUTS

Below are some few keyboard shortcuts, which can help during programming in SAS® Enterprise Guide® (EG).

Purpose	Shortcuts
Convert selected text to upper case	Ctrl + Shift + U
Convert selected text to lower case	Ctrl + Shift + L
Run or submit a program	Ctrl + F3
Comment the selected code	Ctrl + /
Uncomment the selected code	Ctrl + Shift + /
Go to specific row or column	Ctrl + G
Code Indentation	Ctrl + I

CONCLUSION

Mastering SAS® Enterprise Guide®(EG) goes beyond understanding its basic functionality; it involves exploring features that can simplify repetitive tasks, improve clarity, and accelerate analysis. Techniques such as displaying full dataset paths, stacking or appending tables, using abbreviation macros, and applying query builder options not only save time but also minimize errors in clinical and statistical programming workflows. By incorporating these tips and tricks into everyday practice, programmers can achieve greater efficiency, maintain consistency across projects, and unlock the full potential of SAS® EG as a powerful tool for data management and analysis.

REFERENCES

SAS Documentation: <https://support.sas.com/en/documentation.html>

SAS Help Center, SAS® Enterprise Guide® 8.3: User's Guide:

<https://documentation.sas.com/doc/en/egug/8.3/p1teiflqrhk7qnn16i4d6uburzlx.htm>

SAS Help Center, SAS® Enterprise Guide® 8.6:

<https://documentation.sas.com/doc/en/egcdc/8.6/egdoccdc/egamotasks/n0jnxoz7p3t2f3n13kc3hc4xzp0g.htm>

SAS BLOGS:

<https://blogs.sas.com/content/sasdummy/2011/11/17/sas-program-editor-abbrevs/>

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