

APL64: Using EDSS and)EDSS

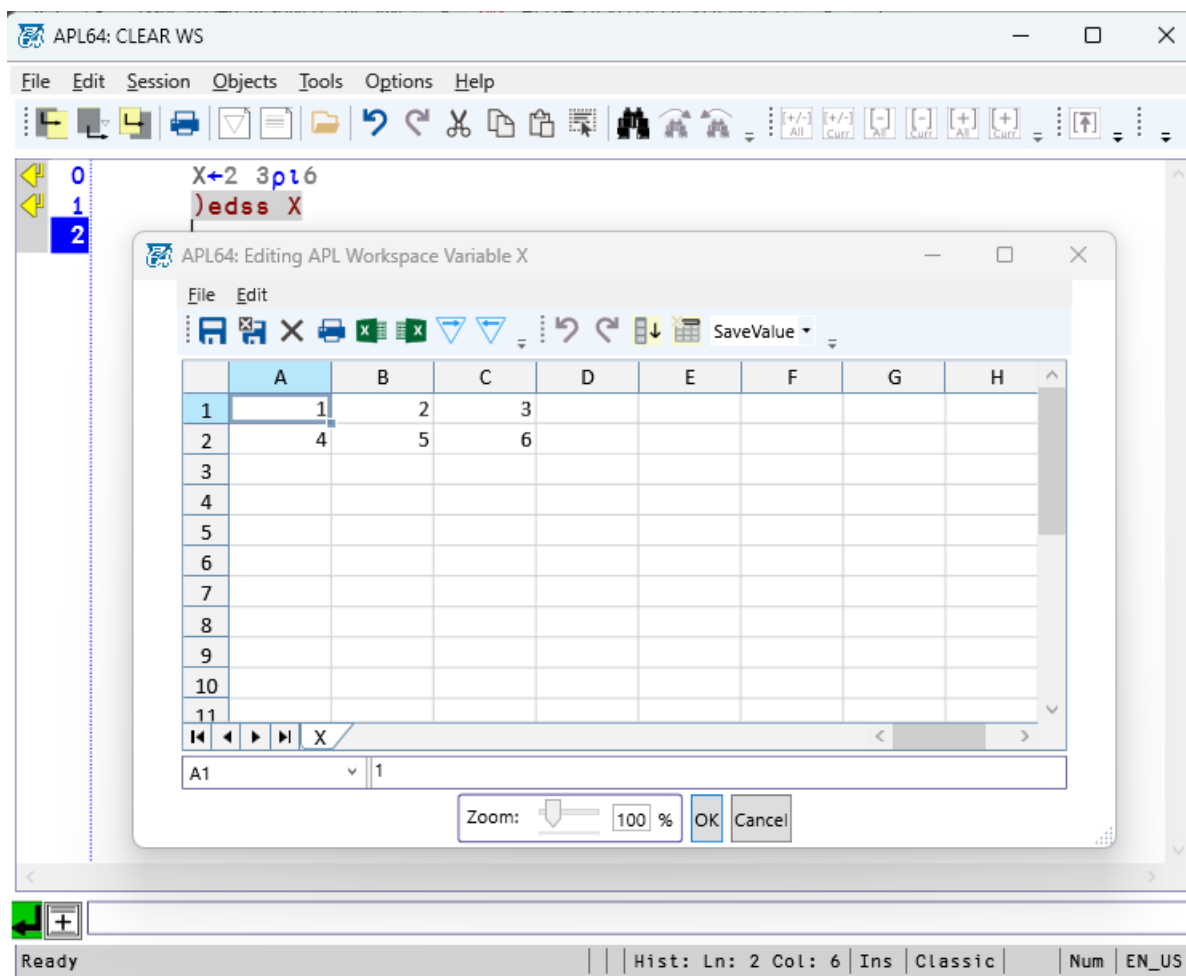
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Overview

The  EDSS system function and)EDSS system command may be used to review and edit the values of an existing APL programmer-defined variable. When executed, the variable's values will be presented in the EDSS worksheet dialog. The value of each element of the APL variable is contained in a cell of the EDSS worksheet dialog:



Syntax

```
⌈edss 'aplVariableName'  
)edss aplVariableName
```

Argument

The APL variable must have rank two or less.

An APL variable which is zilde ($\emptyset$) or contains $\subset \emptyset$ is not supported.

APL Variable Element Data Types Supported	
Element APL Data Type	Examples
Boolean scalar	0, 1
Integer scalar	3, $\bar{3}$, 3E3, $\bar{3}E\bar{3}$
Double scalar	1.234, $\bar{1}.234$, 1.234E3, $\bar{1}.234E\bar{3}$
String scalar	«abcd»
Character scalar	'a'
Enclosed character vector	$\subset$ 'abcd'

Notes

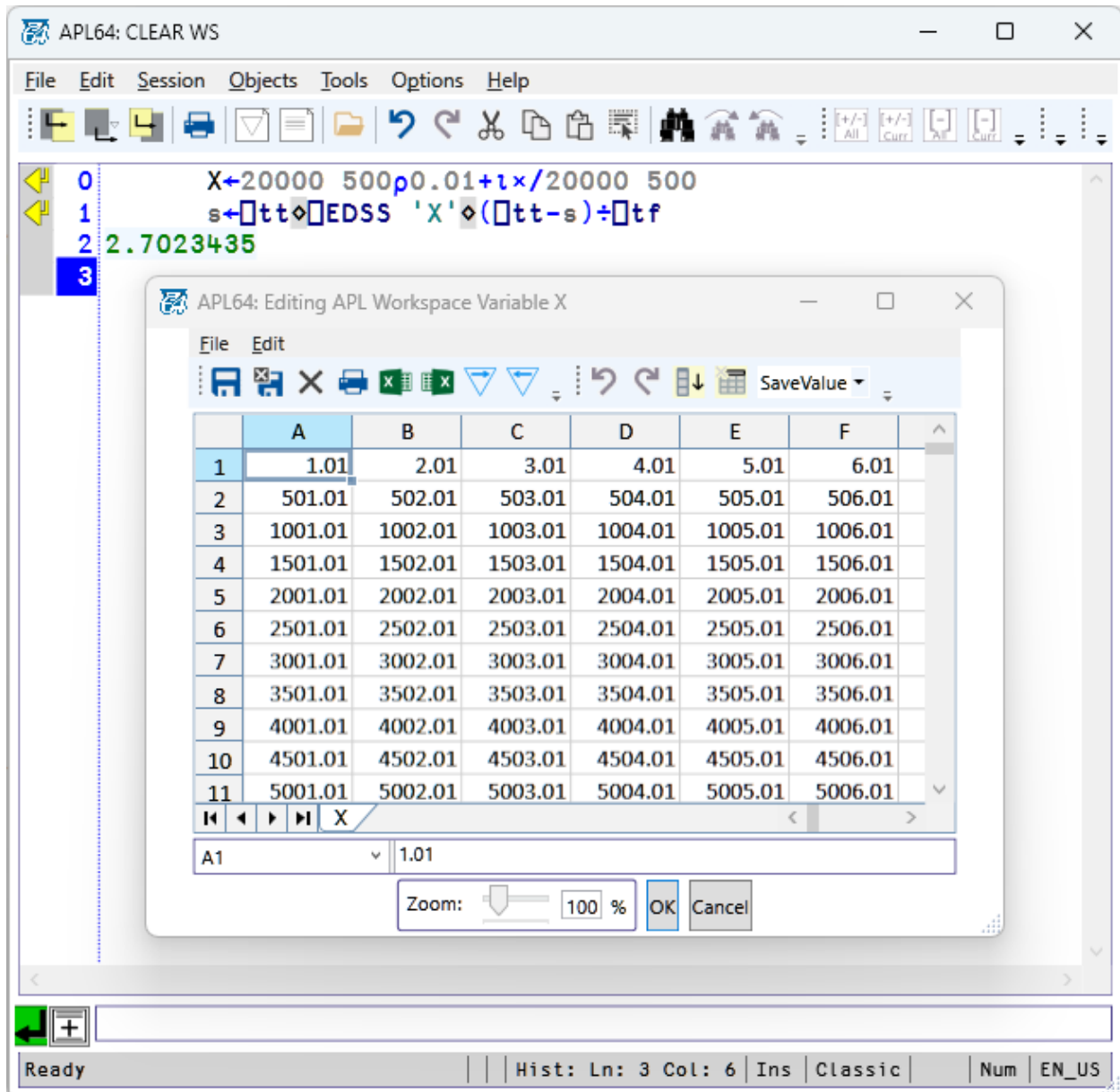
- $\square$ edss has no result.
- $\square$ edss and)edss are available only in the APL64 Developer version.
- $\square$ edss and)edss do not require or use Microsoft Excel.
- The $\square$ edss system function is fully analogous to the)edss system command.
- $\square$ edss and)edss require a right argument and no left argument.
- The EDSS dialog is not modal. Multiple EDSS dialogs may be instantiated in the same APL64 Developer version instance.
- Data may be copied/pasted between an EDSS dialog and other areas of an APL64 Developer version instance, such as another EDSS dialog, the editable classic history pane, the command line and variable or function editors as well as other Windows applications.
- APL64 glyphs or any other Unicode glyphs may be pasted into a cell or entry field of the EDSS dialog. The EDSS dialog does not support the Alt+ or Shift+Alt+ keystroke prefixes to enter APL glyphs.
- An EDSS dialog may be ended using the Cancel/OK buttons or Ctrl+Q/Ctrl+E keyboard shortcuts,
- If an EDSS dialog is not successfully closed, the APL variable will not be updated in the workspace.
- The $\square$ EDSS system function, and)EDSS system command, are supported only in the APL64 development version.
- The maximum number of worksheets, columns and rows supported in the EDSS worksheet dialog are the same as Microsoft Excel xlsx format.
- Cell formulas may be saved as the formula text or the evaluated value of the formula using the SaveValue/SaveFormula combobox on the EDSSI dialog window.
- Hyperlinks in worksheets which are imported to EDSS are preserved in the EDSS dialog. Hyperlinks may be edited in the EDSS dialog. Only the hyperlink display text can be saved to an APL variable.

Performance

The performance of EDSS is excellent. For example, importing a large rank-2 APL variable into the EDSS dialog is extremely fast.

$X \leftarrow 20000 \ 500p0.01 + i \times / 20000 \ 500$

☐ EDSS 'X'



Used Range of an EDSS Dialog

The 'used range' of an EDSS dialog is determined by the contiguous array of EDSS dialog cells which have existing values at the time the dialog is closed, or which had existing values at any time during the EDSS dialog existence. The used range can contain cells which never had a value, because they are included in the contiguous array of EDSS dialog cells which define the 'used range'. The APL programmer-defined variable in the workspace will be updated using the 'used range'.

The EDSS dialog worksheet format cannot contain/preserve APL shape or rank metadata. It is up to the APL64 programmer to handle the shape and rank of an APL programmer-defined variable modified by the EDSS dialog.

The rank of the updated variable will depend on the number of row and columns in the used range of the worksheet:

#Rows in Used Range	#Columns in Used Range	Rank of Updated Variable
1	1	0
1	≥1	1
≥1	≥1	2

Data Type Conversion

- The EDSS dialog worksheet format cannot distinguish between the APL64 string and APL64 character data types. An APL variable element which has the string or character data type before modification by the EDSS dialog will have the character data type when the EDSS dialog is closed, and the APL variable is updated.
- An EDSS dialog cell which is empty will become an empty character vector (Ⓒ'') element in the APL result variable.
- The EDSS dialog worksheet format cannot distinguish between the APL Boolean, Integer or Double data types. An APL variable element which has the APL Boolean, Integer or Double data type before modification by the EDSS dialog will have the double data type when the EDSS dialog is closed, and the APL variable is updated.
- After editing, an EDSS dialog cell in the used range of the worksheet which contains text which can be converted to a number will have the double data type.
- After editing, an EDSS dialog cell in the used range of the worksheet which contains text preceded by a single quote (') will have the character data type.

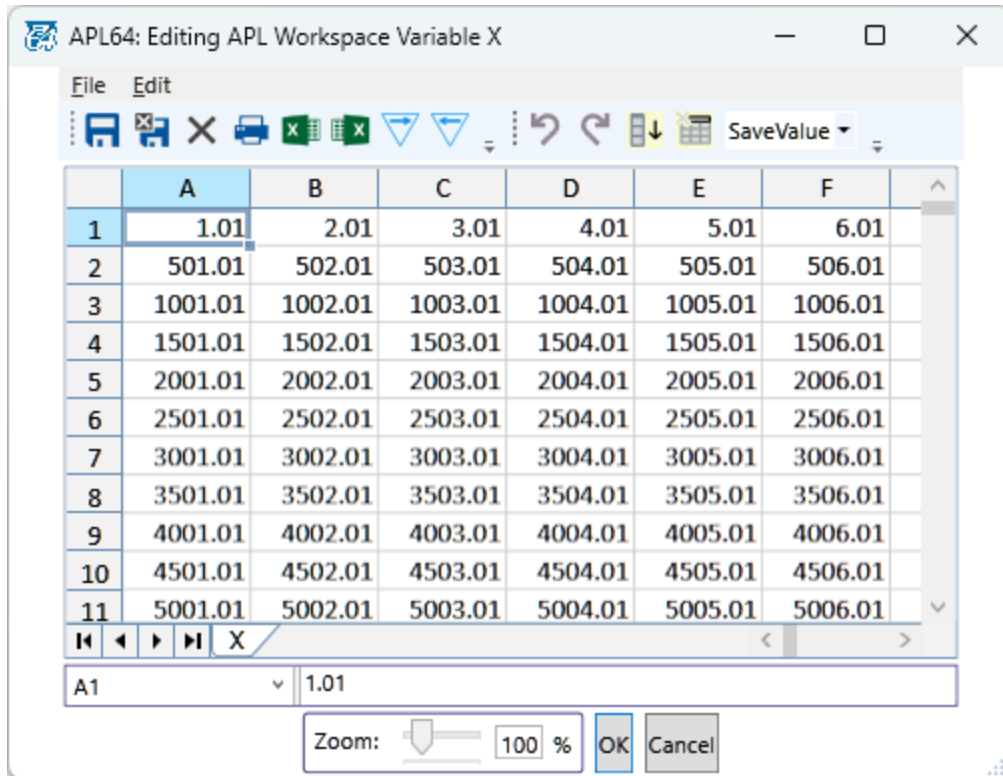
Editing the Value of an Existing Cell

Editing a Cell Value

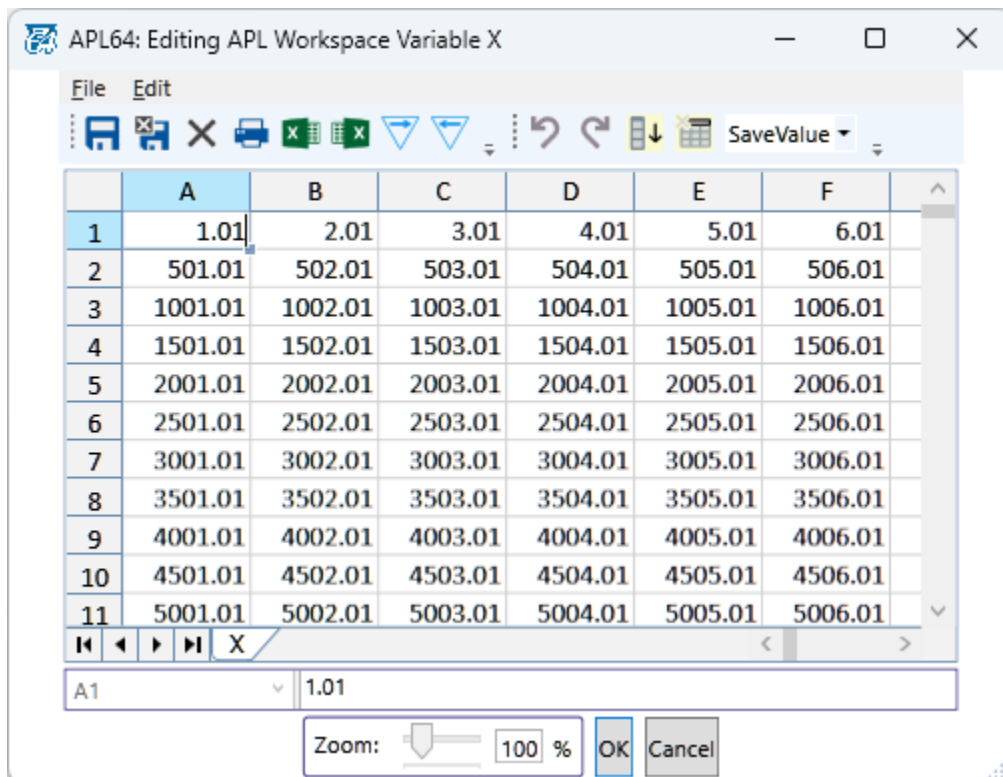
To edit the value of an EDSS dialog worksheet cell with a pre-existing value, the cell must be set to edit mode, for example with a double left mouse click on the cell. To instantiate the edited value in the cell, after entering the desired value, the cell must be changed to non-edit mode by placing the keyboard focus on a different cell.

Moving the keyboard focus to an EDSS dialog worksheet cell without setting the cell to edit mode, places that cell in replacement mode, so that the first glyph keystroke will replace the entire value of the cell and subsequent keystrokes will be appended to the cell value.

Cell A1 is in replacement mode:

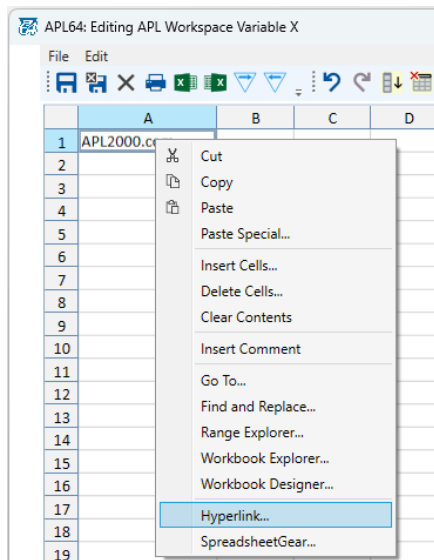


Cell A1 is in edit mode:

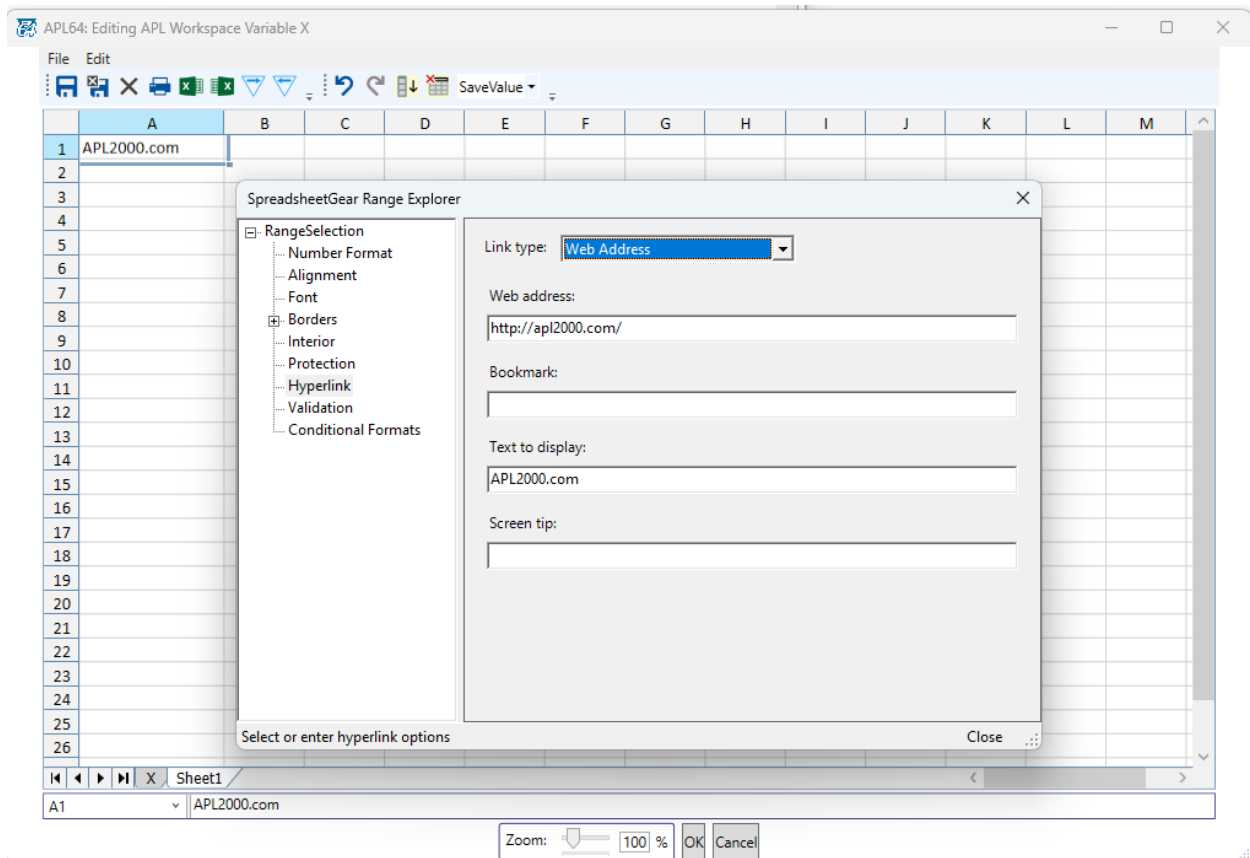


Create a HyperLink Cell

To make the active cell a hyperlink cell, right mouse click on the active cell and select the hyperlink option:

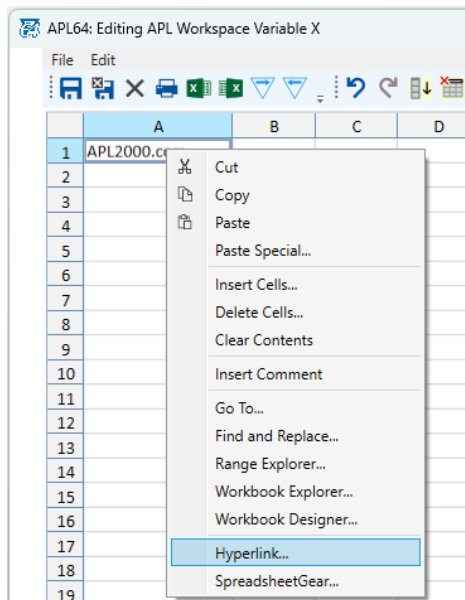


Complete the desired fields in the Hyperlink editing dialog:

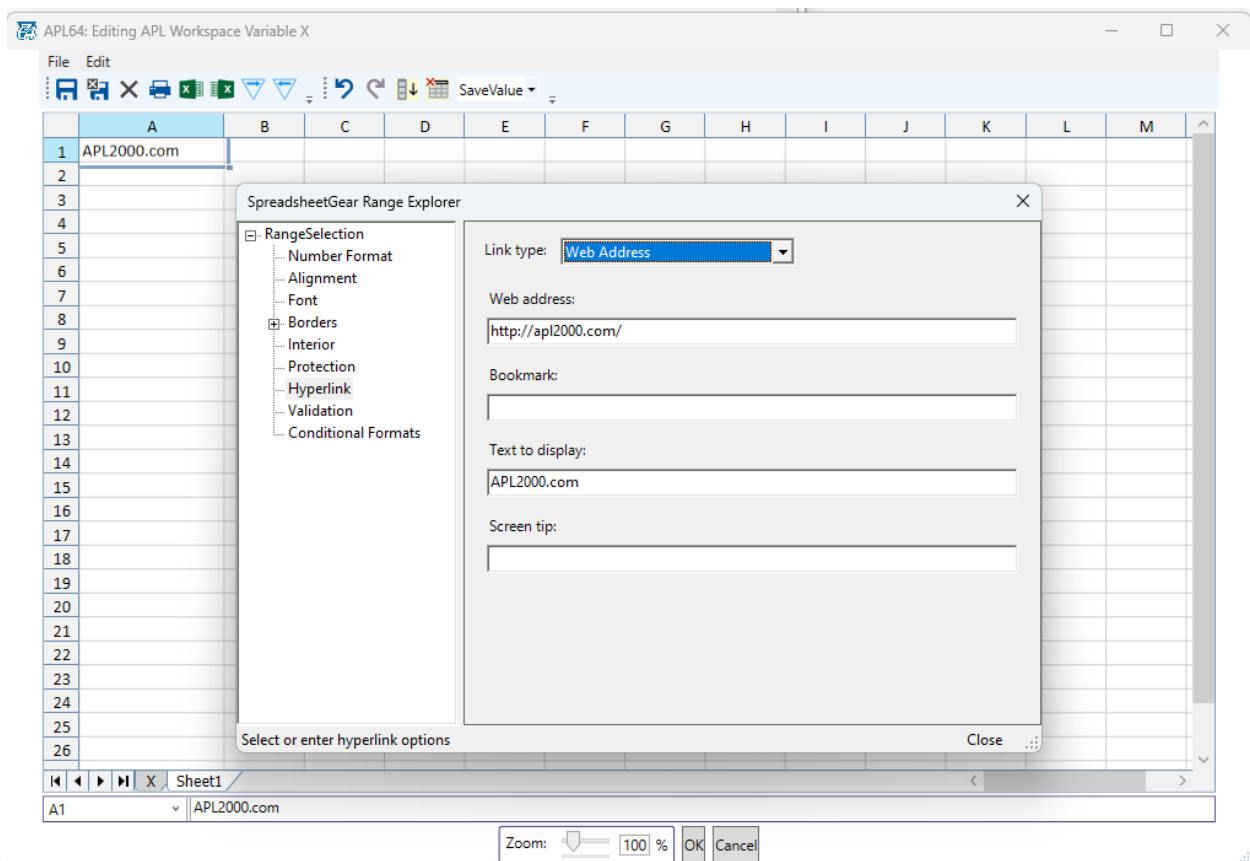


Edit a Hyperlink Cell

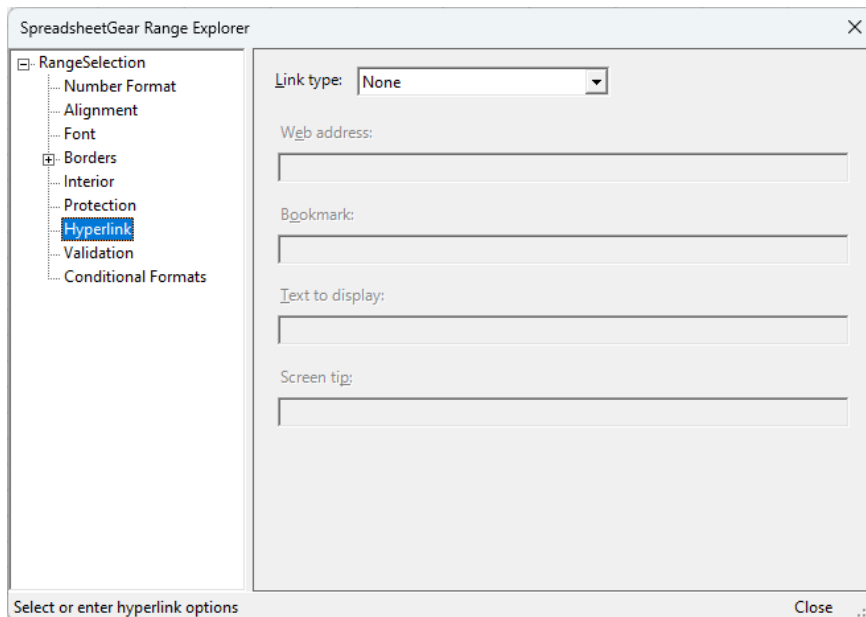
If the active cell contains a hyperlink, right mouse click on the hyperlink cell, and select the Hyperlink option to edit the hyperlink:



Review and edit the fields in the Hyperlink editing dialog:



To remove the hyperlink in the cell, select the Link type as 'None':



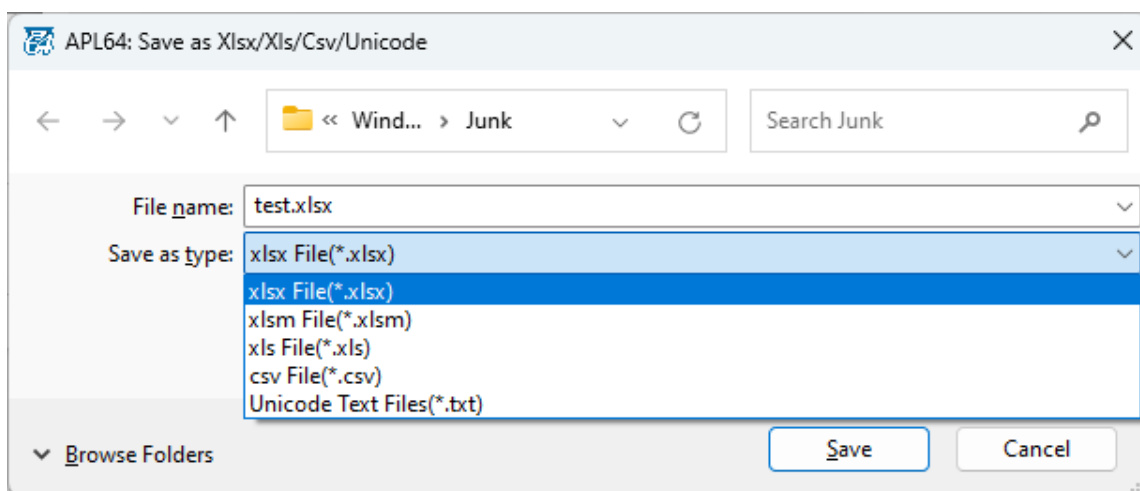
Save

The EDSS dialog provides a save action. If a portion of worksheet(s) are to be saved, select the applicable cell range(s) for the worksheet(s) to be saved.

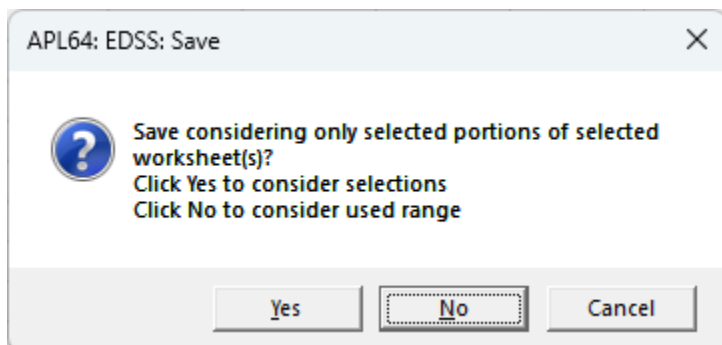
Click the or File | Save Selected Workbook Content as Xlsx, Xlx, Csv, or Unicode... menu item or the  toolbar button to present the save dialog.

If the worksheet to be saved contains hyperlinks, they will be saved to the target file, if the selected target file format supports hyperlinks.

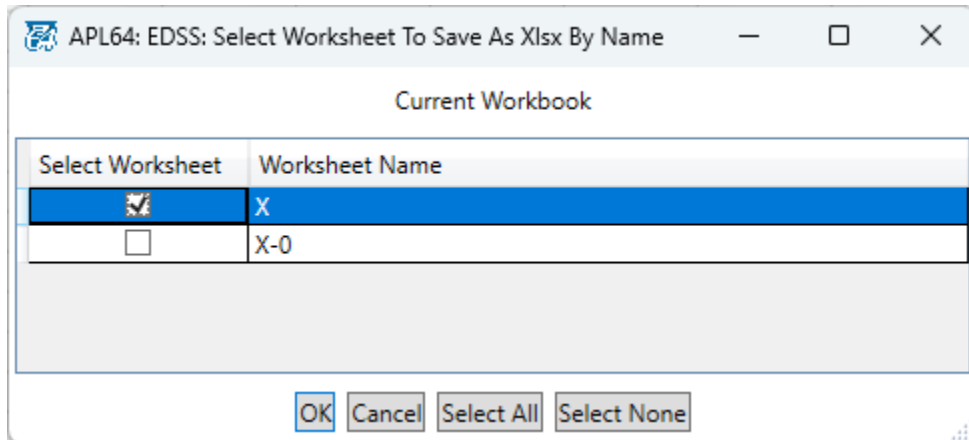
When the Save button of the EDSS dialog is clicked the File Save As dialog is presented. Several file formats are available:



After the user has specified a file name, the Selection Option dialog is presented. When only the user-selected portion of the worksheet(s) to be saved is to be considered, click the 'Yes' button. If the 'No' button is clicked the 'Used Range' of the worksheet(s) to be saved is considered.



If the EDSS instance contains more than one worksheet, the worksheet selection dialog is presented. When saving to CSV or Unicode Text format only one worksheet may be selected.



When the 'OK' button is clicked the file is created according to the user's specifications for the save action.

Print

The EDSS dialog provides a print action. Select the cell range(s) for the current worksheet to be printed.

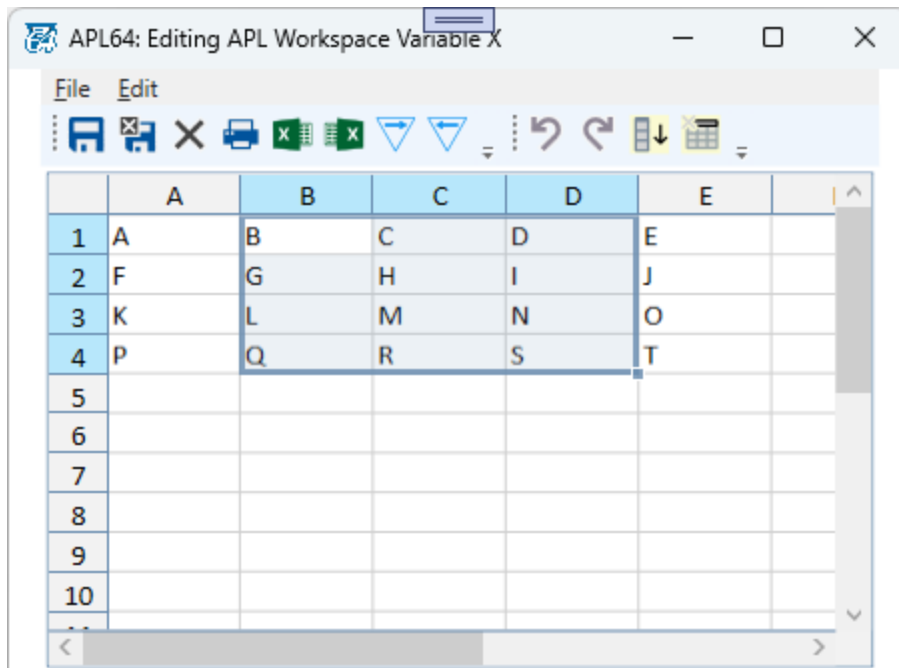
Sort Rows

The EDSS dialog provides a sort rows action. Prior to clicking the Sort Rows button:

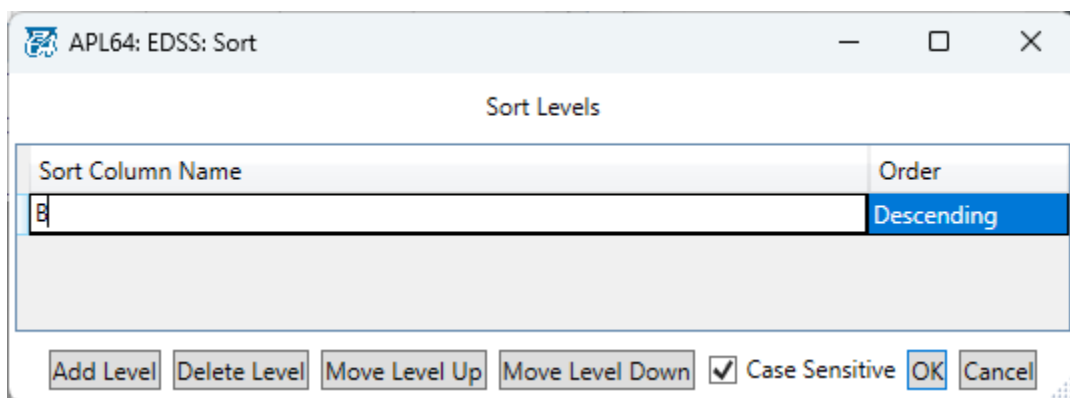
- Define a variable and instantiate an EDSS dialog for the variable.

```
X←4 5p a
edss 'X'
```

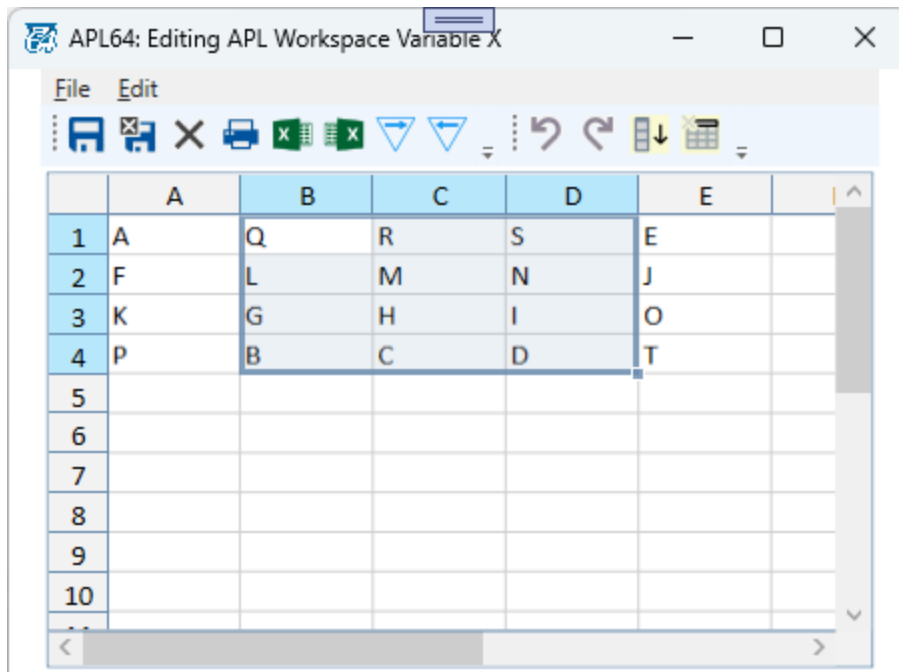
- If the EDSS dialog contains multiple worksheets, select the applicable worksheet
- Select the single applicable contiguous cell range to sort



When the Sort Rows button is clicked, the Sort Levels dialog is presented. Click the 'Add Level' button and select the column on which to sort and the sort order. Each subsequent sort level, if any, is used to break sorting ties of the previous sort level. Duplicate sort columns may not be selected.



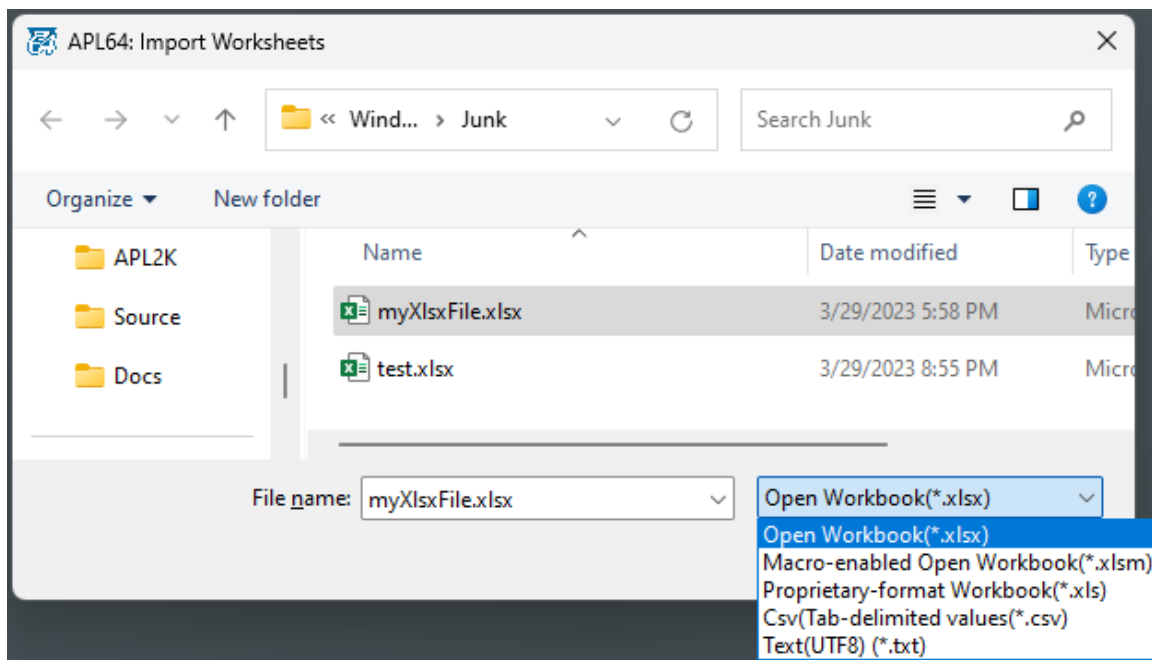
When the OK button is clicked, the selected range of the selected worksheet is sorted:



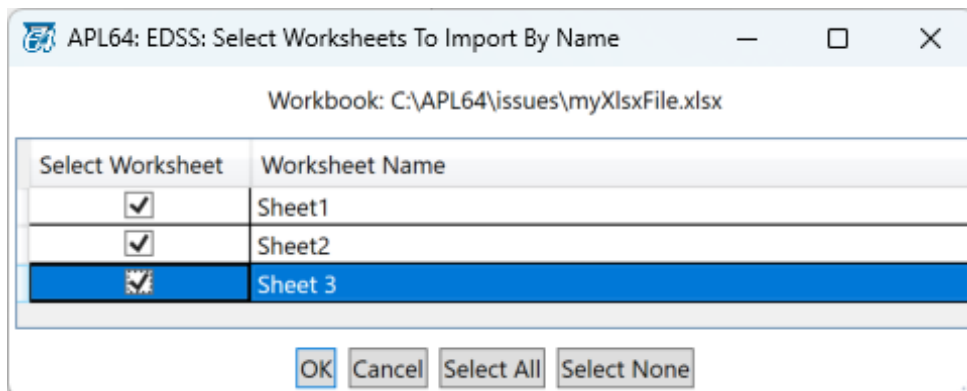
Import Worksheets

The EDSS dialog supports an Import action to import Excel worksheets into an EDSS dialog. If the Excel worksheet to import contains hyperlinks, they will be imported to the EDSS dialog.

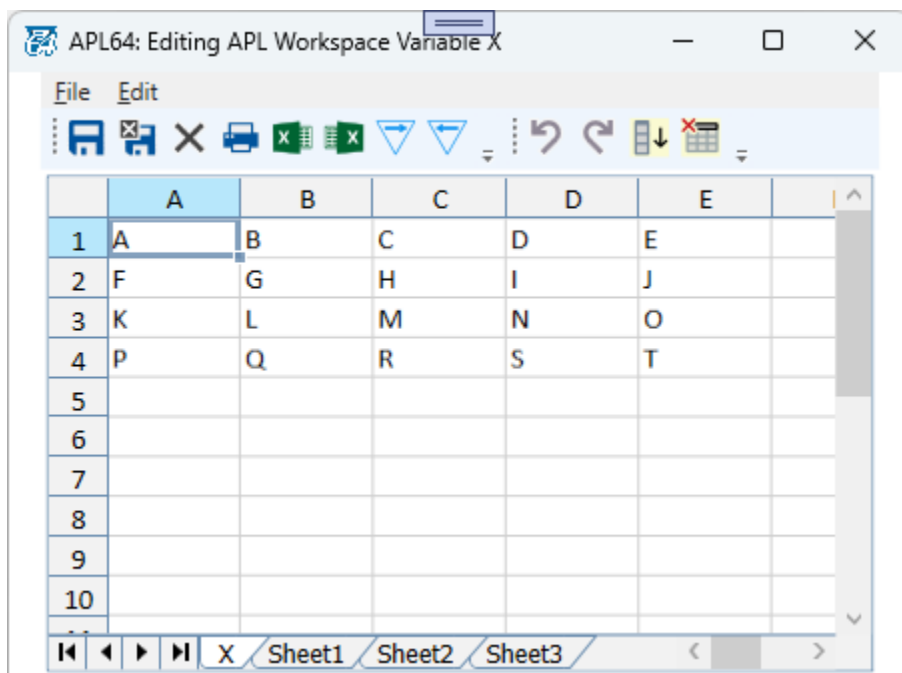
When the Import button is clicked, the Import Worksheets file open dialog is presented. Enter or browse to the existing file to import, select the format associated with the source file from the available supported formats:



When the file open dialog Open button is clicked, the Select Worksheets to Import by Name dialog is presented. Check the Select Worksheet column in the rows with the names of the worksheets to import.



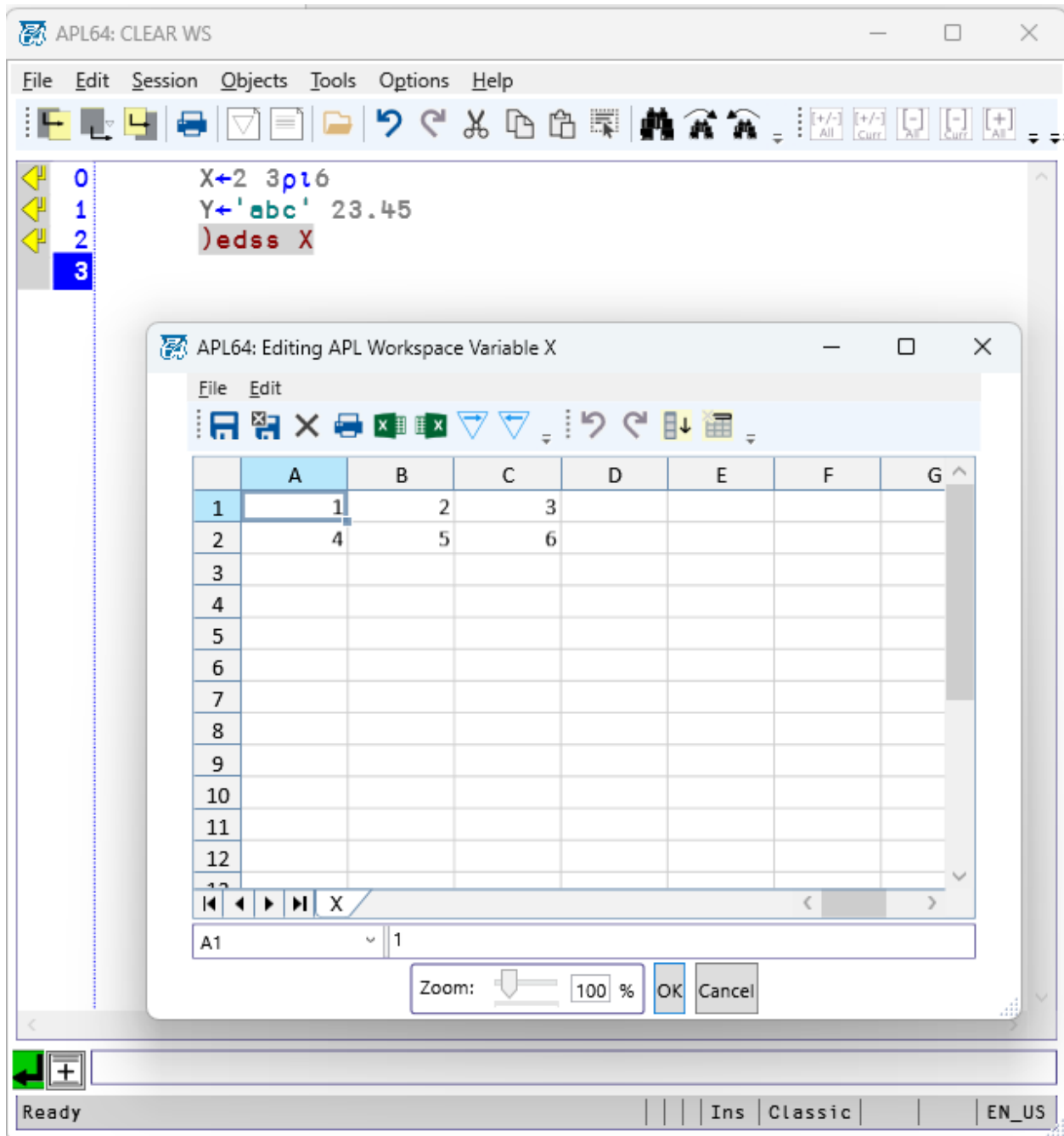
When the OK button of the Select Worksheets to Import By Name dialog is clicked, the values of the 'used range' of the selected worksheets will be copied to the imported worksheets in the EDSS dialog:



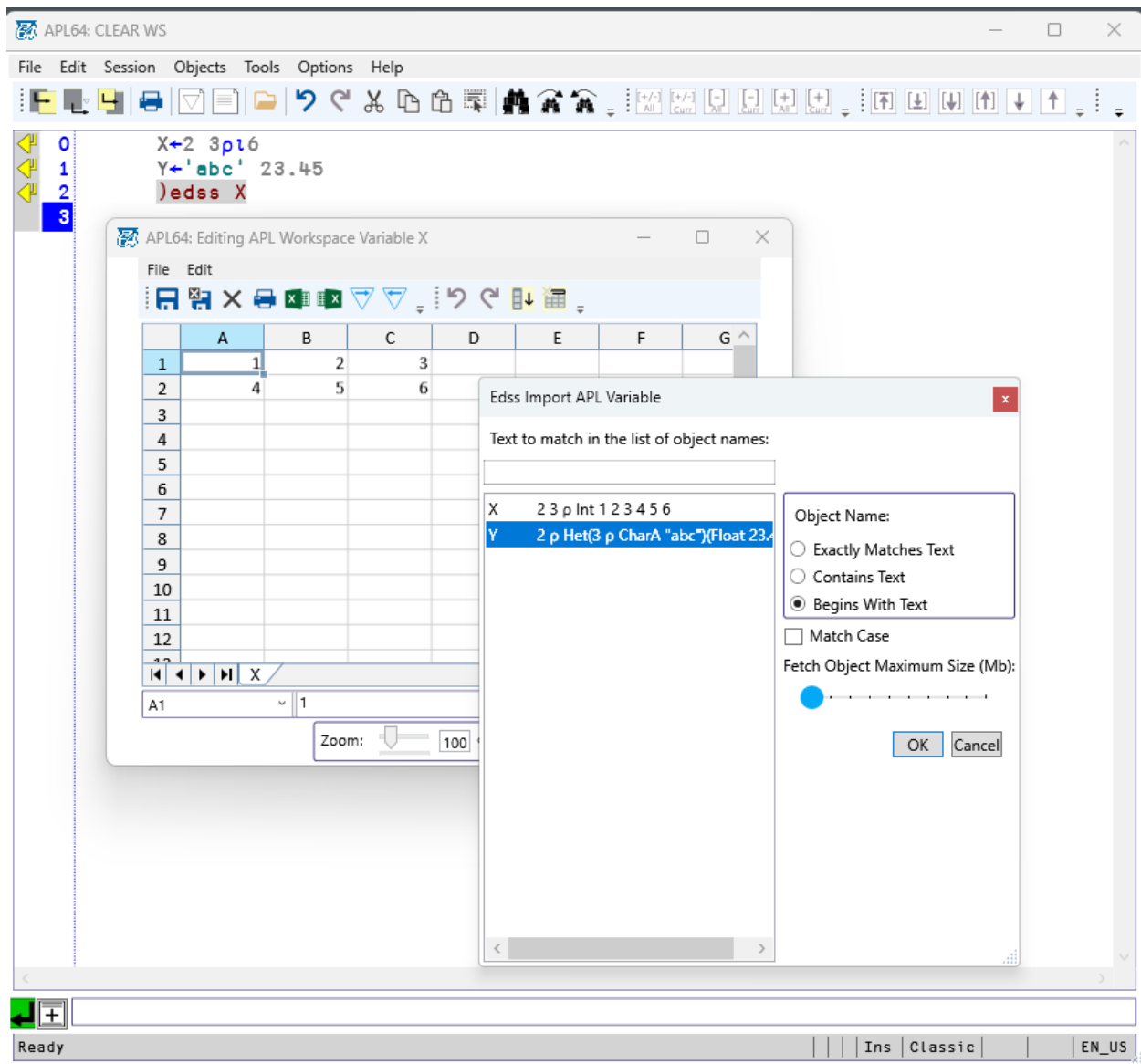
If the name of a worksheet to be imported is the same as the name of an existing worksheet in the EDSS dialog, the imported worksheet name will be suffixed with '-####', where '####' is a consecutive integer selected by the EDSS dialog.

Import an APL Variable to a Worksheet

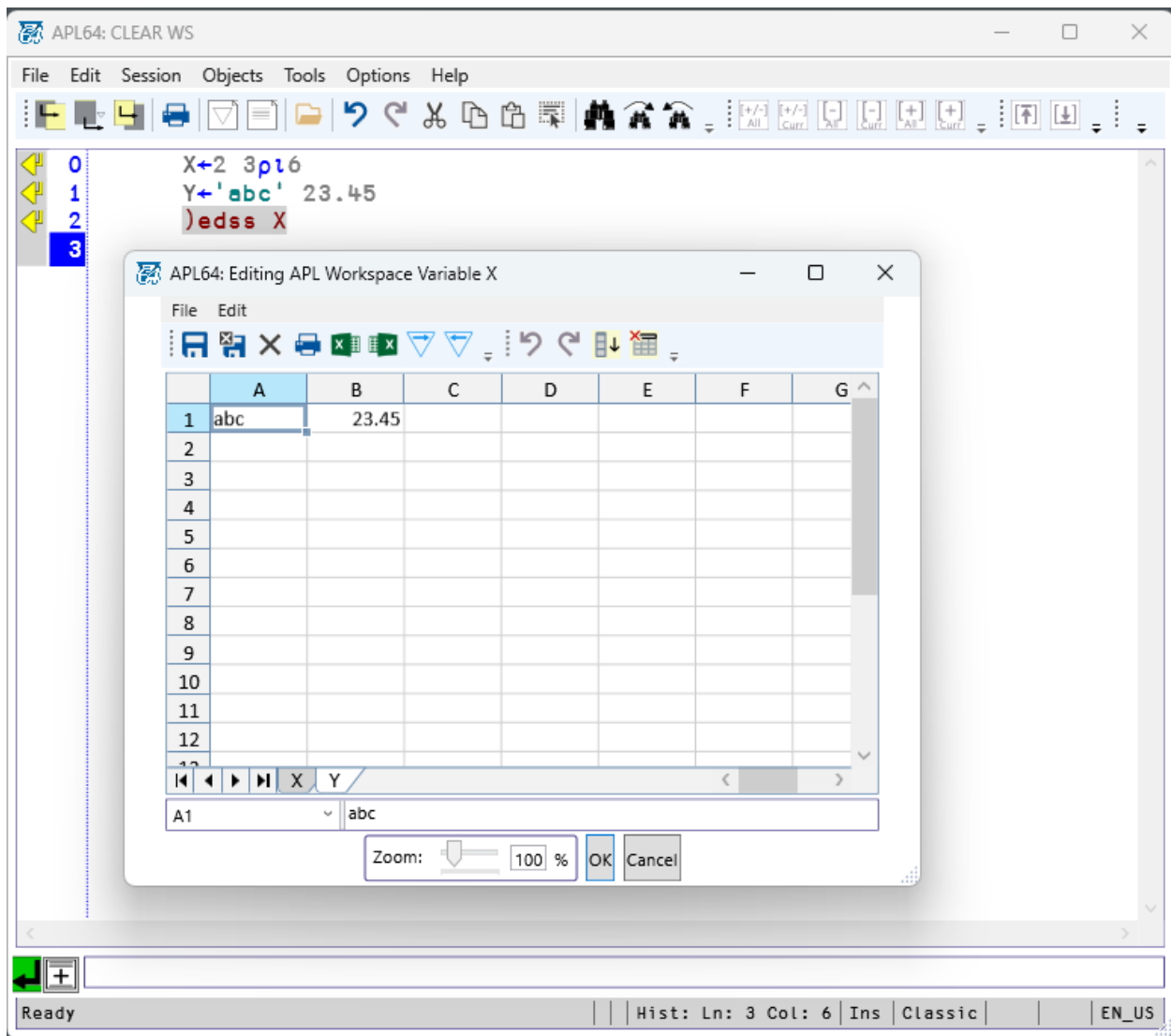
Click the **File | Import APL Variable to Worksheet** menu item or toolbar button  to select the workspace variable to import to the EDSS editor as a worksheet:



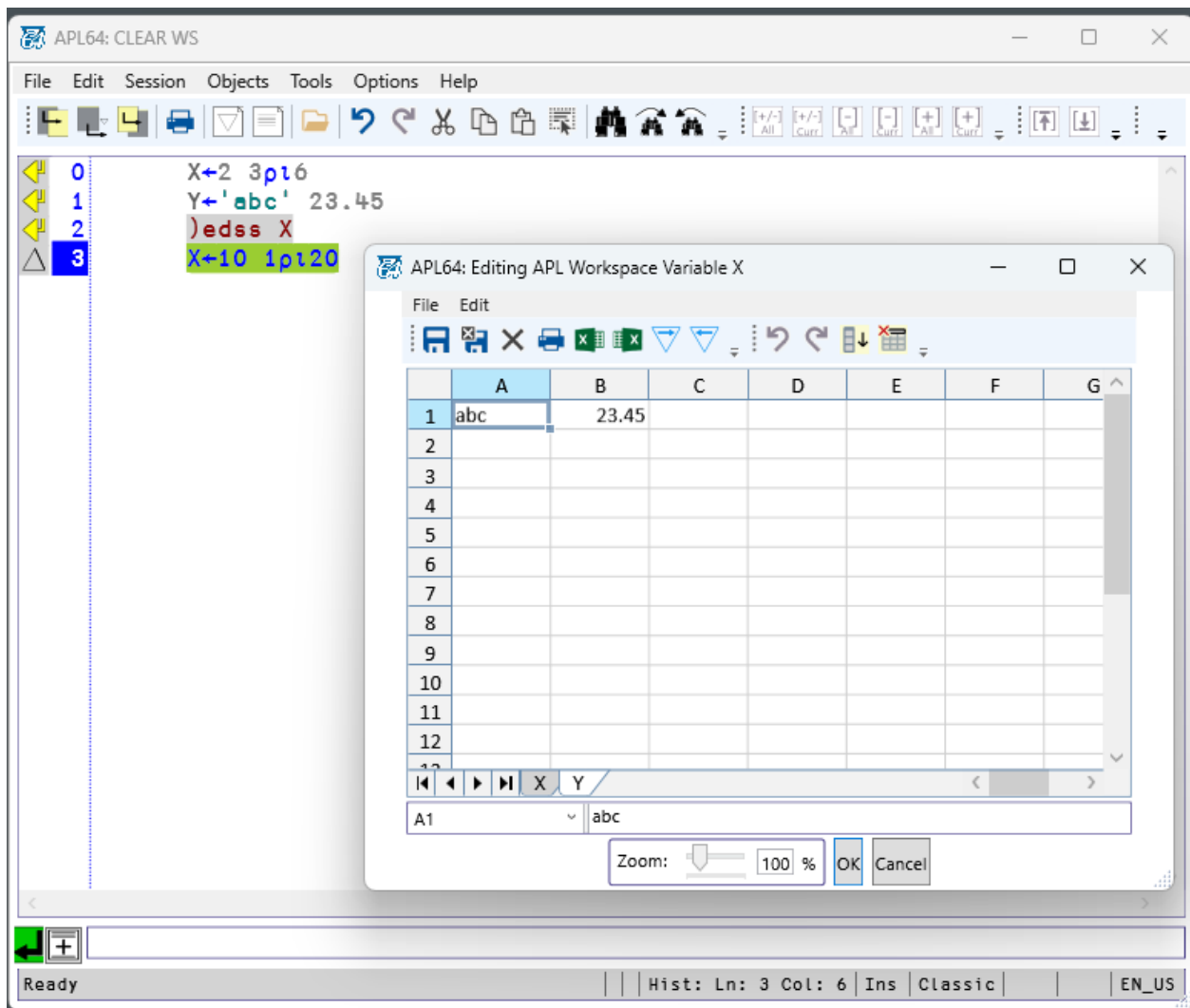
The Object Selector dialog will be presented to select the workspace-resident APL variable to import to the EDSS editor. In this case Y is selected:



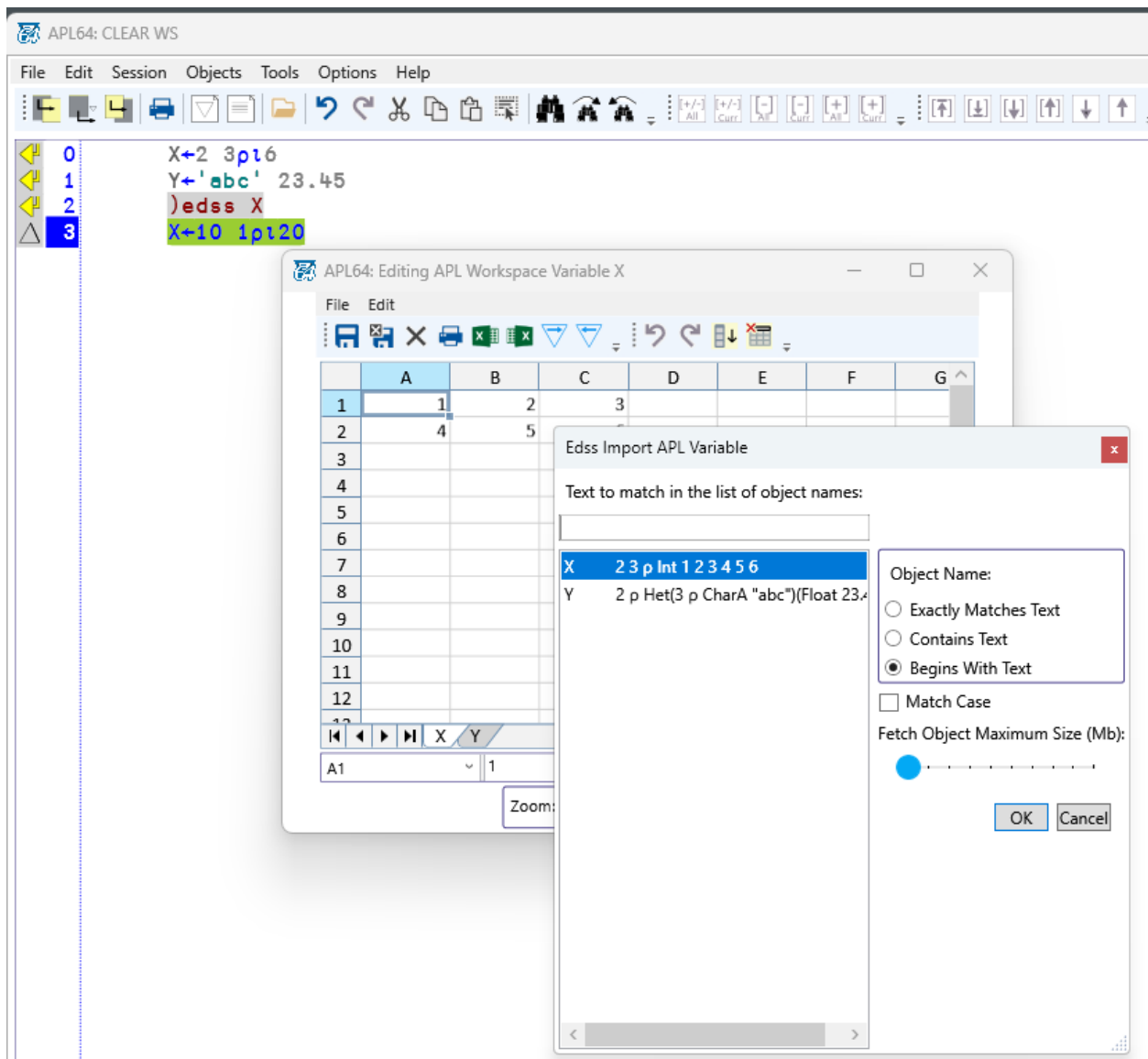
When the OK button of the Object Selector dialog is clicked, a new worksheet will be added to the EDSS editor containing the values of the APL Y variable:



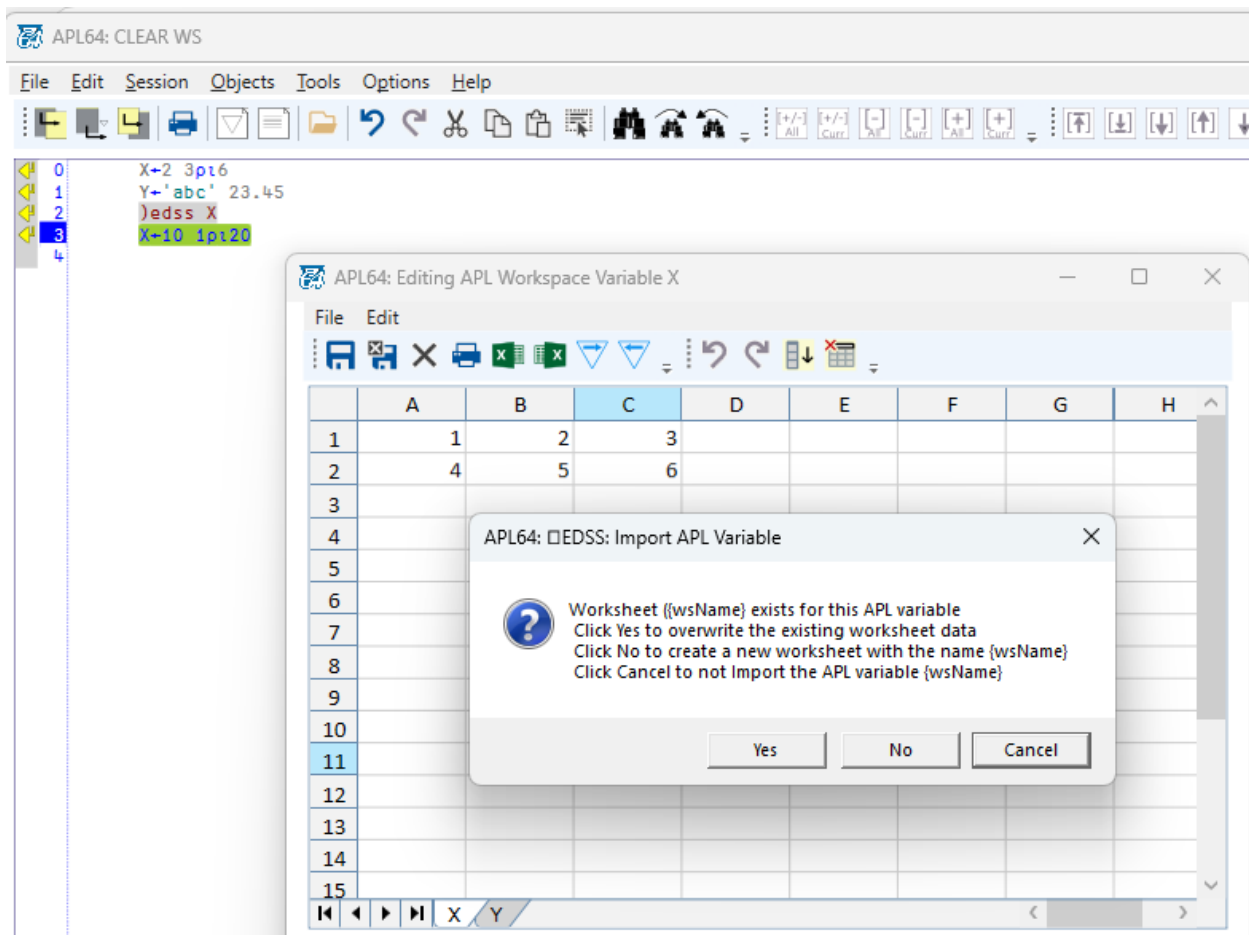
With the EDSS editor open, modify the value of the workspace-resident APL variable X. The EDSS editor is non-modal, so the value of a workspace resident APL variable can change since editing the variable in an EDSS editor.



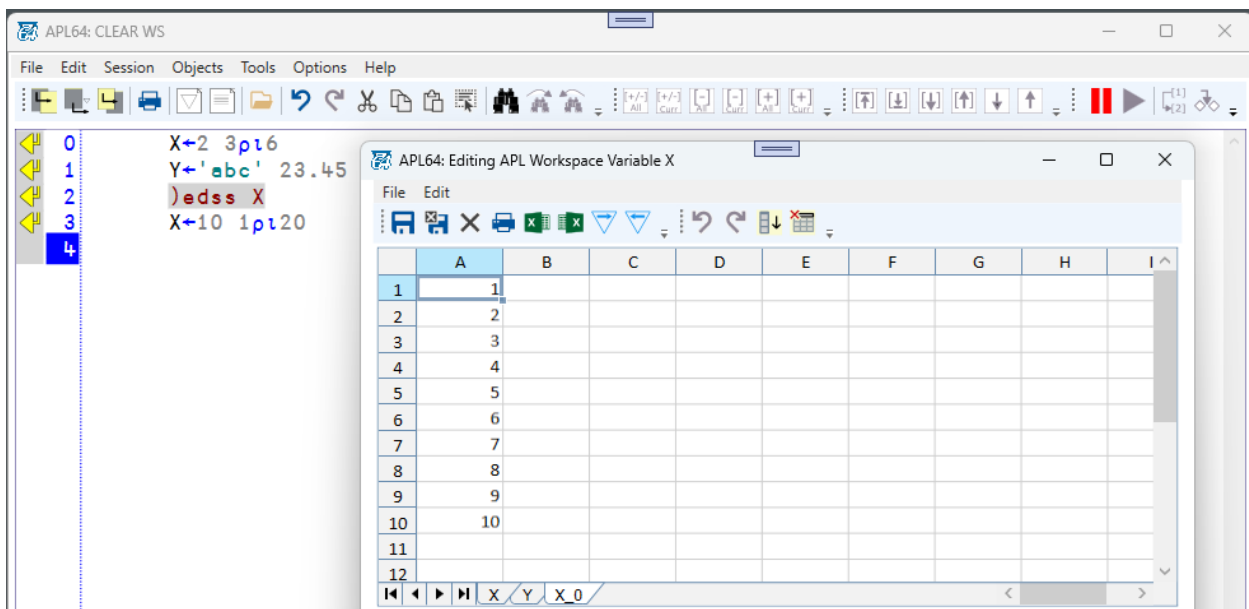
Now import the updated value of X by using the Import APL variable menu item or toolbar button, so that the Object Selector dialog is presented. Select the variable X and click the OK button:



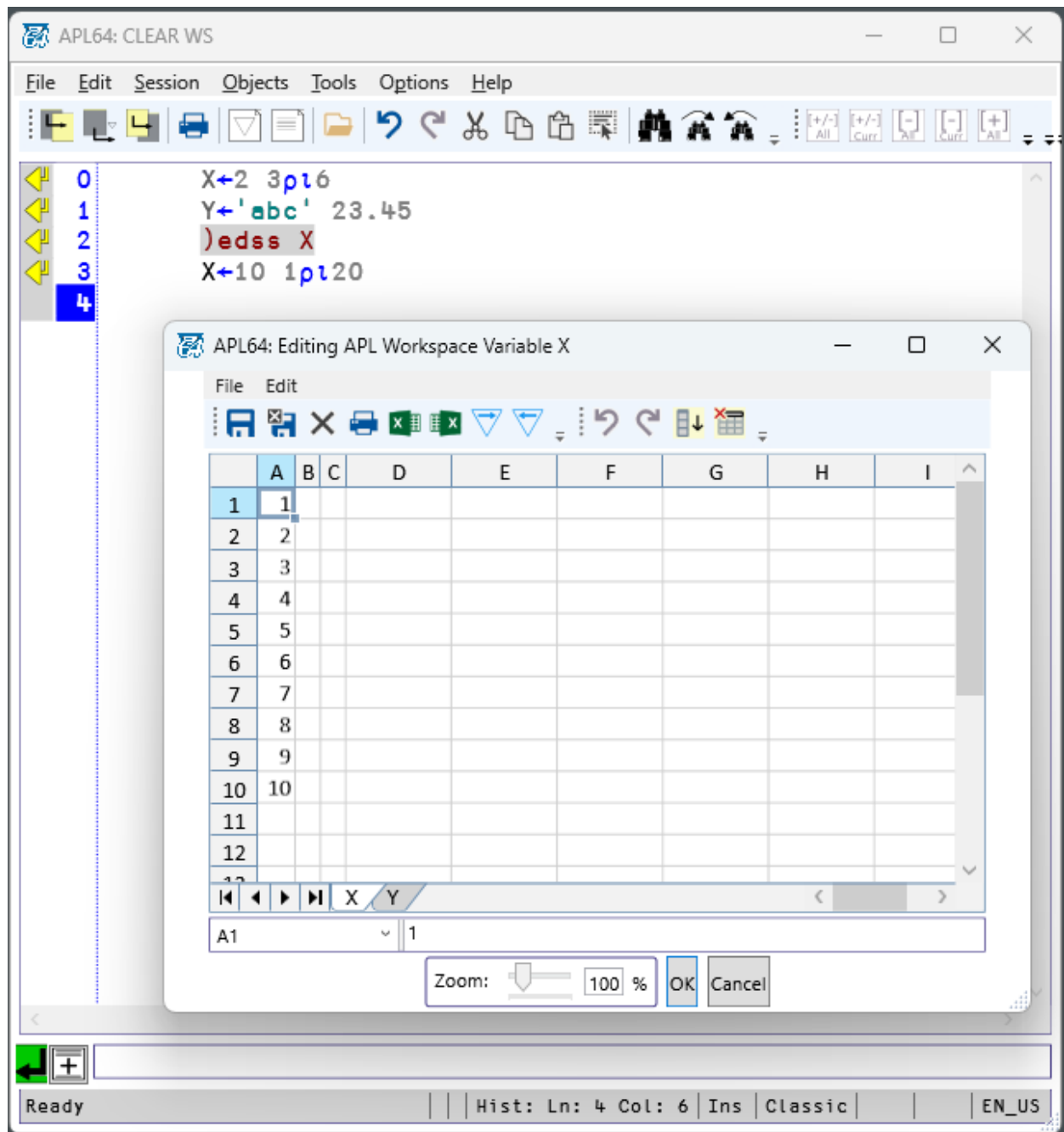
Because there is an existing worksheet named 'X', options are provided to overwrite the existing values of X in the EDSS editor, create a new worksheet in the EDSS editor, or cancel the Import action.



In this example the 'No' button was clicked to create a new worksheet, with a name which avoids duplicate worksheet names:



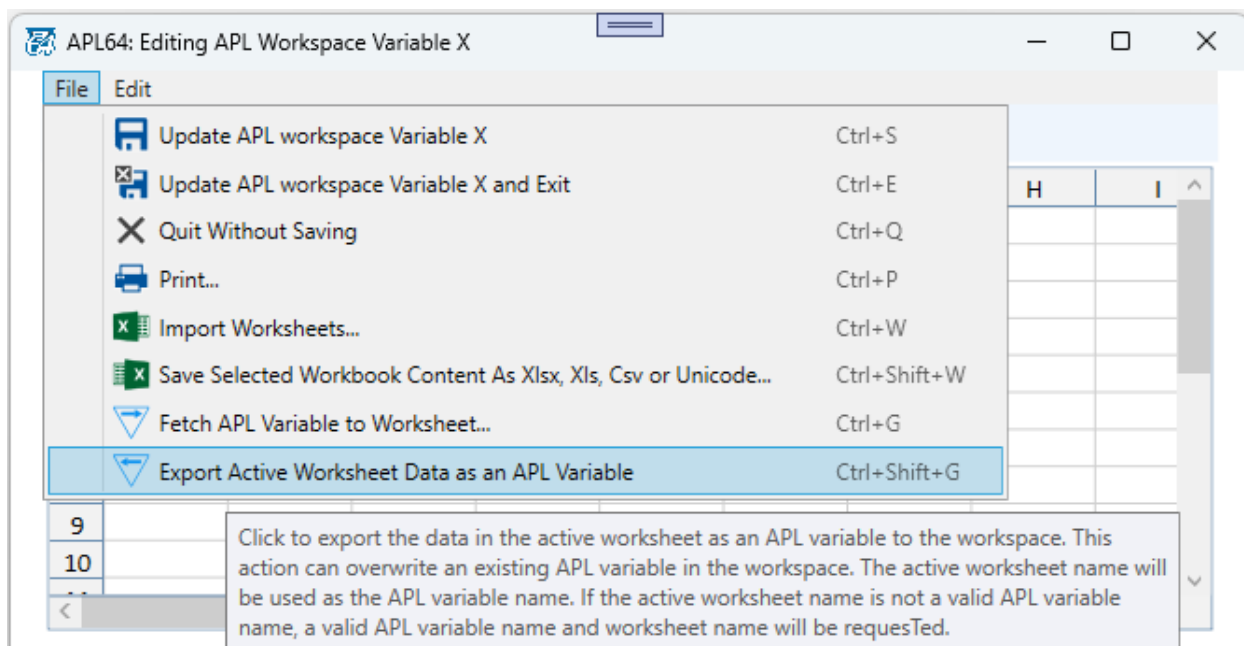
If the 'Yes' button was clicked the existing data in the X worksheet is cleared and replaced by the updated value of the X variable in the workspace:



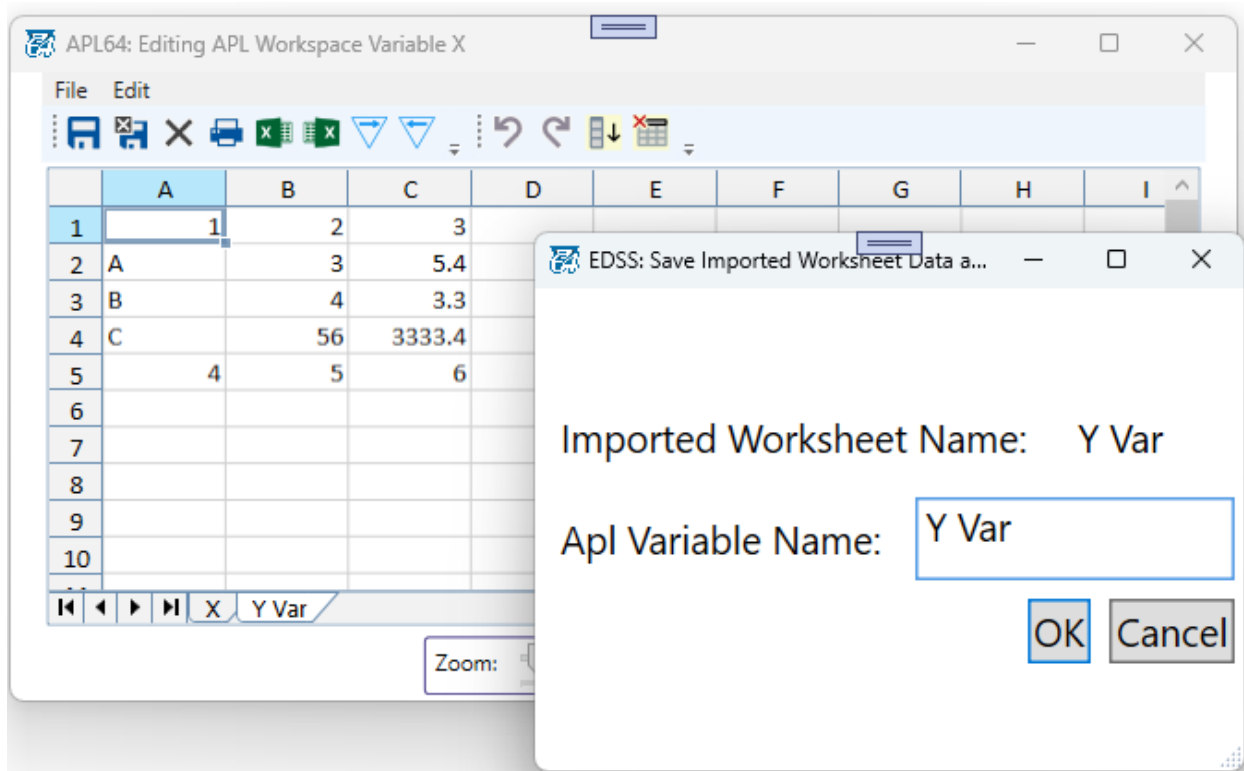
Export Active Worksheet Data to an APL Variable

The EDSS dialog supports exporting data in the active worksheet to the APL workspace as an APL variable. If the worksheet to be exported contains hyperlinks, only the cell display text of the hyperlink will be saved to the APL variable.

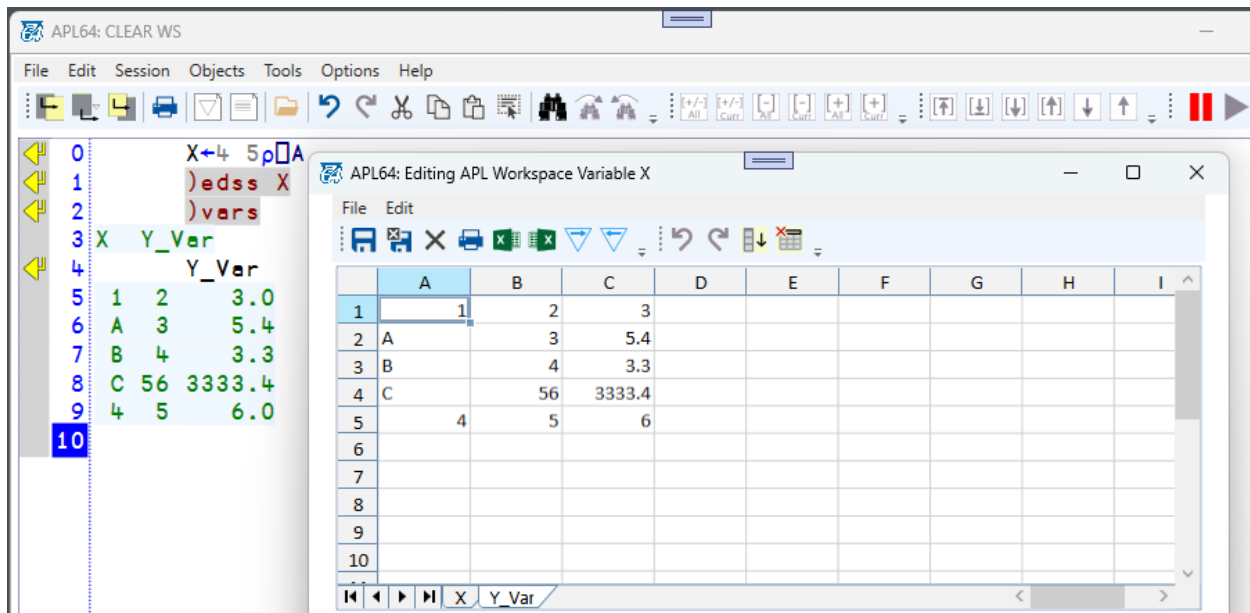
Click the **File | Export Active Worksheet Data As APL Variable** menu item or the toolbar button  to initiate this action. If the exported worksheet name is a valid APL variable name, the data will be saved to the workspace with that variable name.



However, if the imported worksheet name is not a valid APL variable name, a dialog will ask the user for a valid variable name.



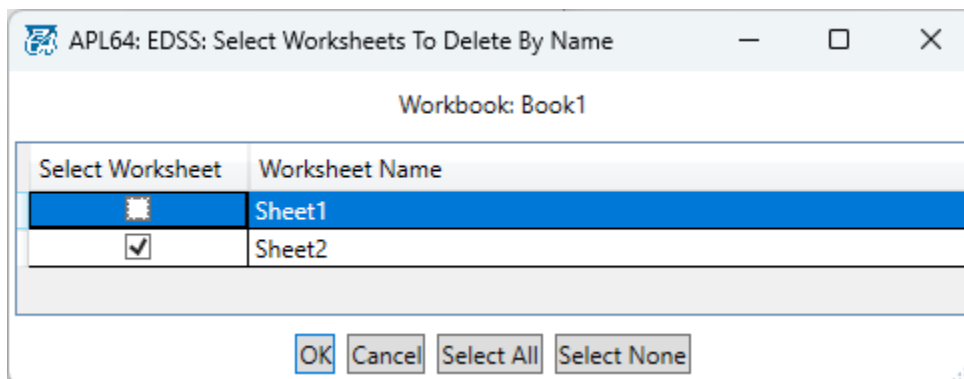
After entering a valid APL variable name, click OK to save the data to the variable name:



Delete Worksheets

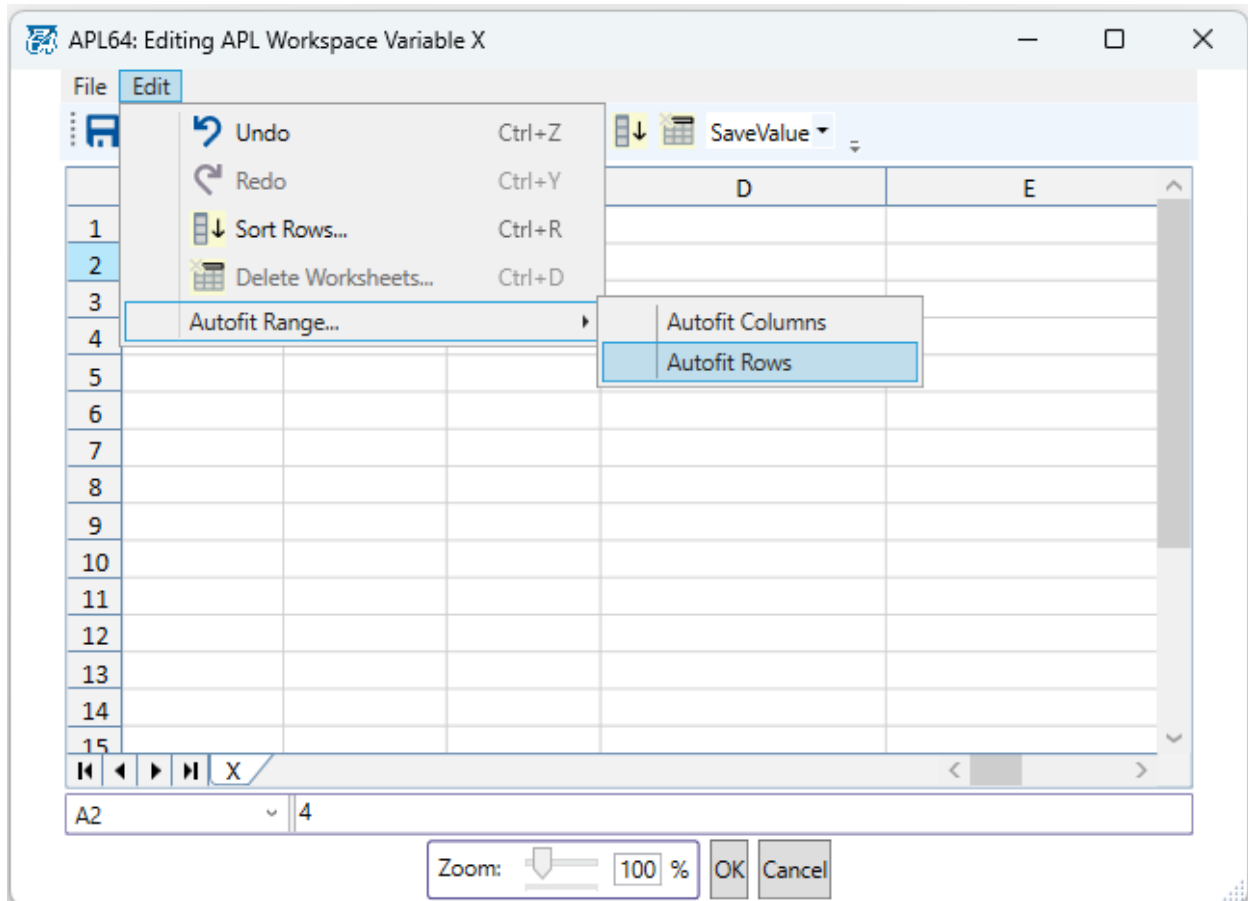
The EDSS dialog supports the Delete action. When the Delete key is clicked the 'Select Worksheets to Delete by Name' dialog is presented. Check the Select Worksheet column in the rows with the names of the worksheets to delete. Clicking the OK button on the Select Worksheets to Delete by Name dialog will delete the selected worksheets in the EDSS dialog.

When the EDSS dialog is presented, e.g. using syntax such as `EDSS 'X'`, the initial worksheet is named for an APL variable in the workspace, e.g. X, and the values of this variable are placed in the cells of the initial worksheet. The initial worksheet associated with this variable cannot be deleted.



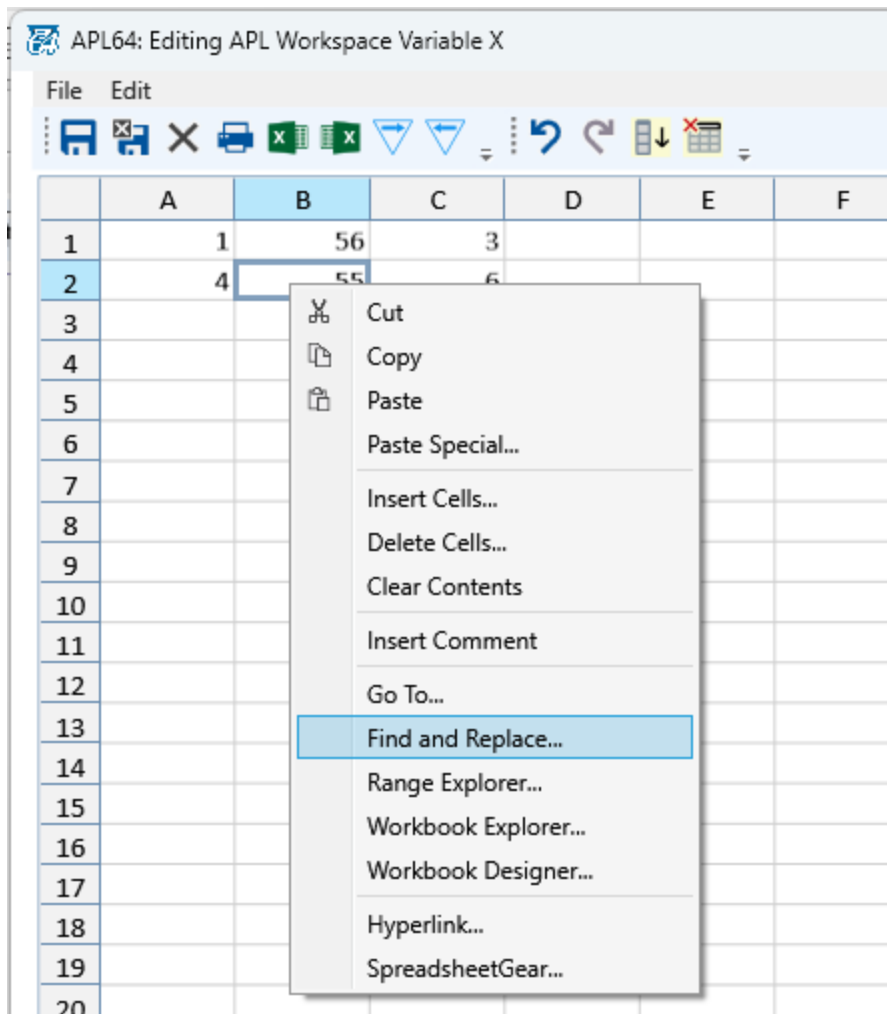
Autofit Columns or Rows

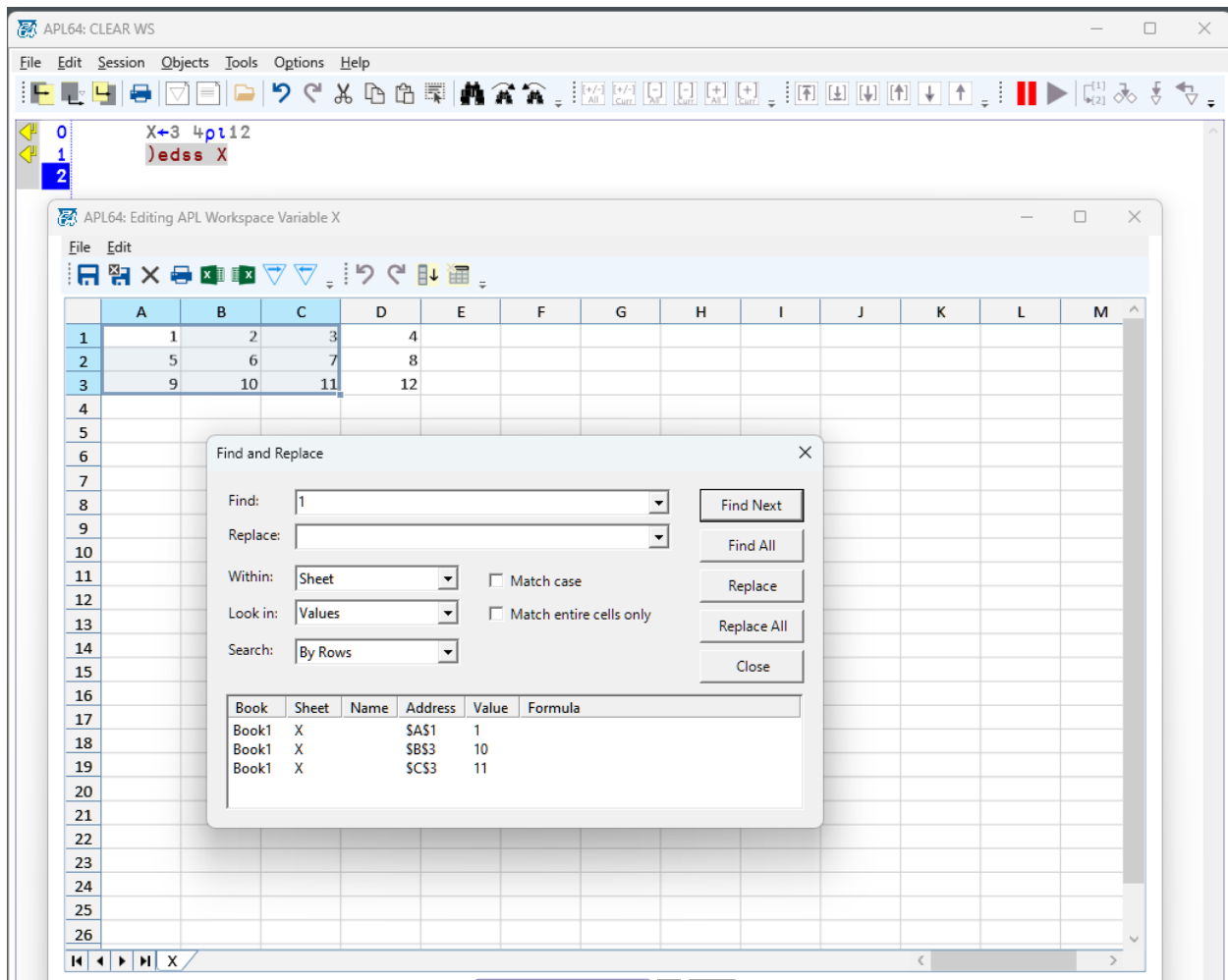
The EDSS dialog supports the Autofit Columns or Autofit Rows actions for a user selected range of cells. After selecting a range of cells use the available Edit | Autofit Range ... options:



Find and Replace

The EDSS dialog supports find and replace actions. Use the Ctrl+F or Ctrl+H keyboard shortcuts or the 'Find and Replace' context menu to display the Find and Replace dialog:

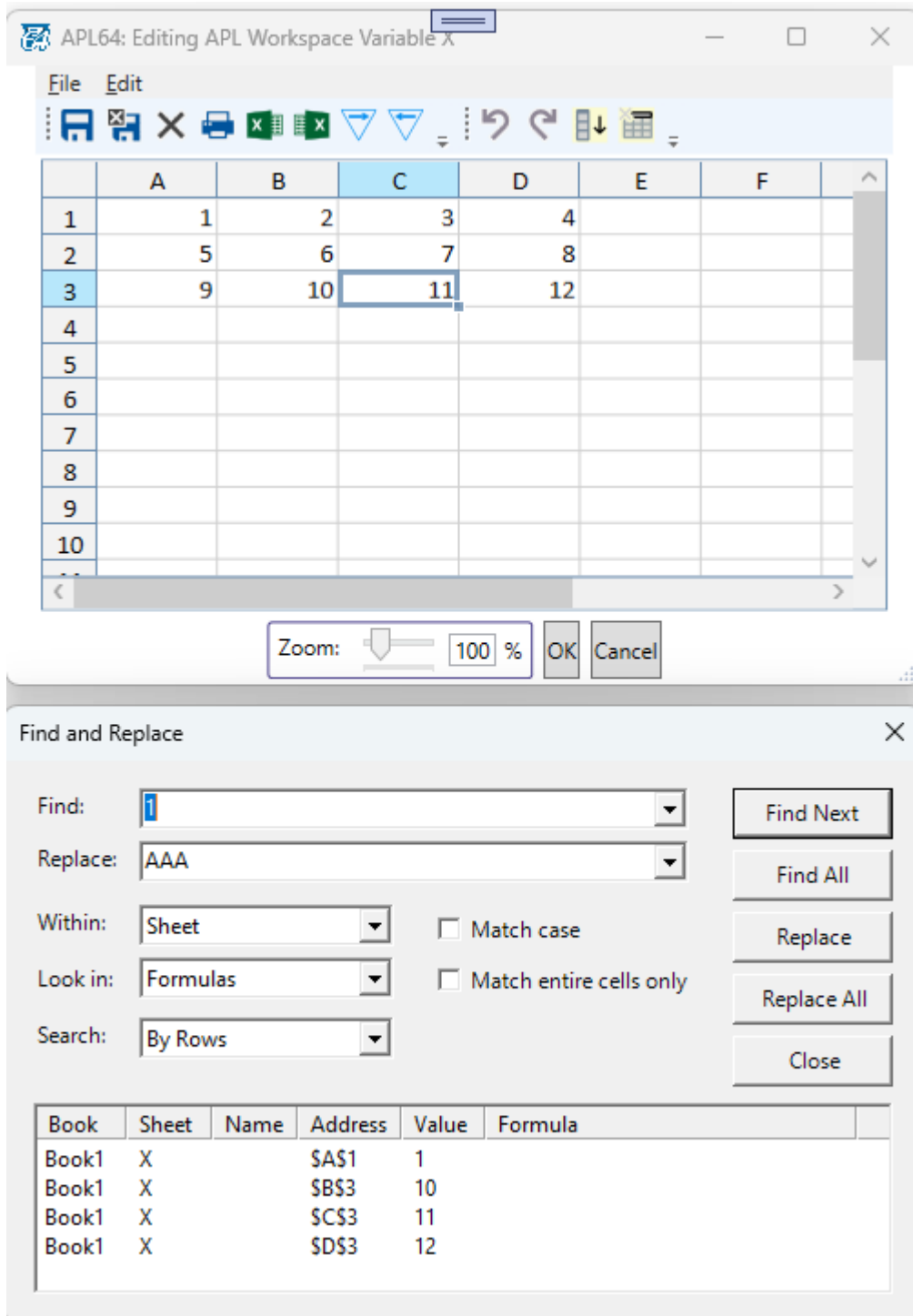




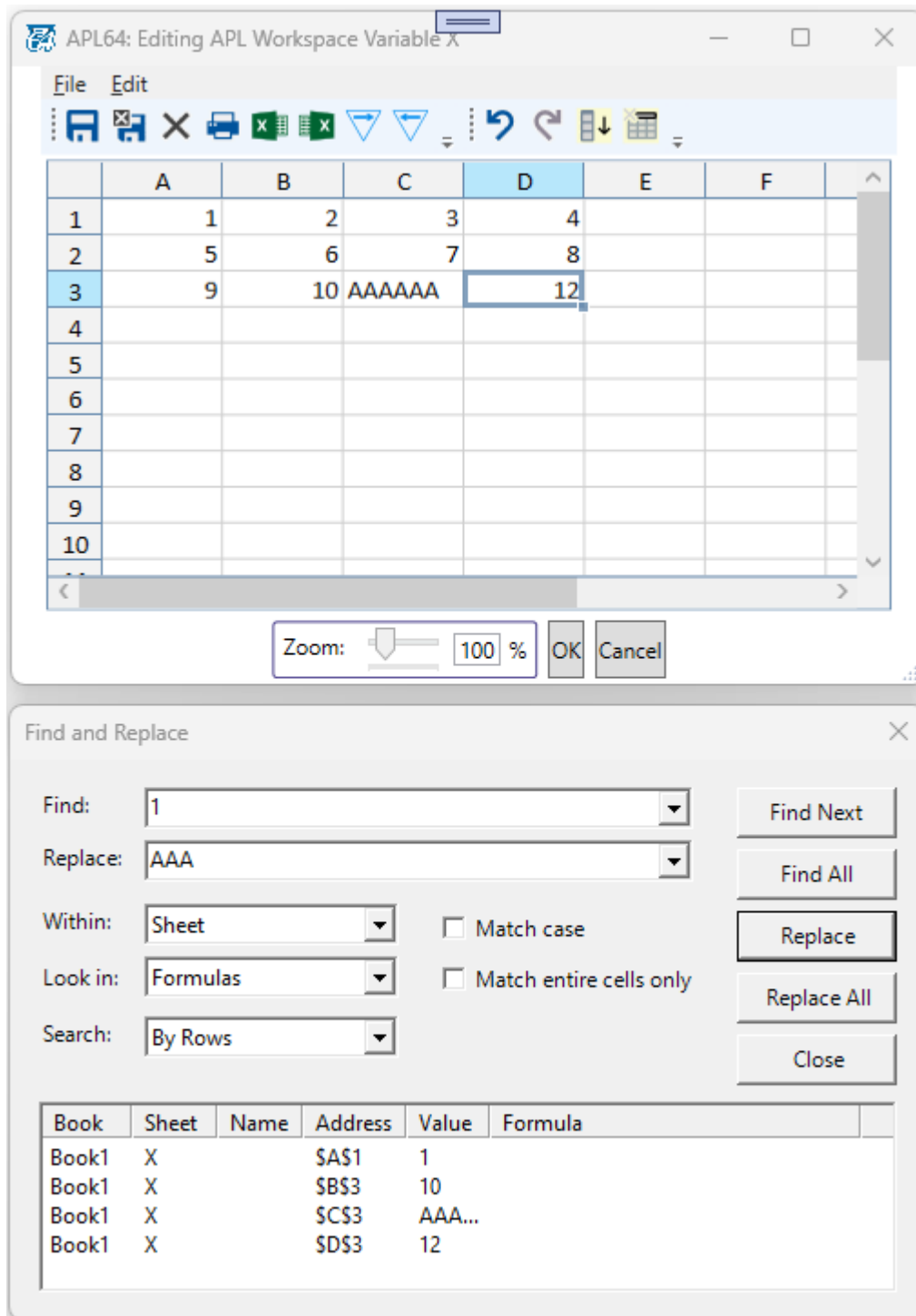
Enter the Find text, select the search criteria click the 'Find Next' or 'Find All' buttons to perform the find action.

If a selection has been made in the worksheet, the Find and Replace action will apply to that selection. If no selection has been made in the worksheet, Find and Replace action will apply to the 'used range' of the worksheet. If a worksheet cell is in edit mode, the find and replace actions are disabled until that cell exists edit mode.

Enter the Replace text and click the Find Next and Replace buttons or the Replace All button to perform the Replace action:



Click the Replace All button to update matched cells in the scope of the find and replace actions:



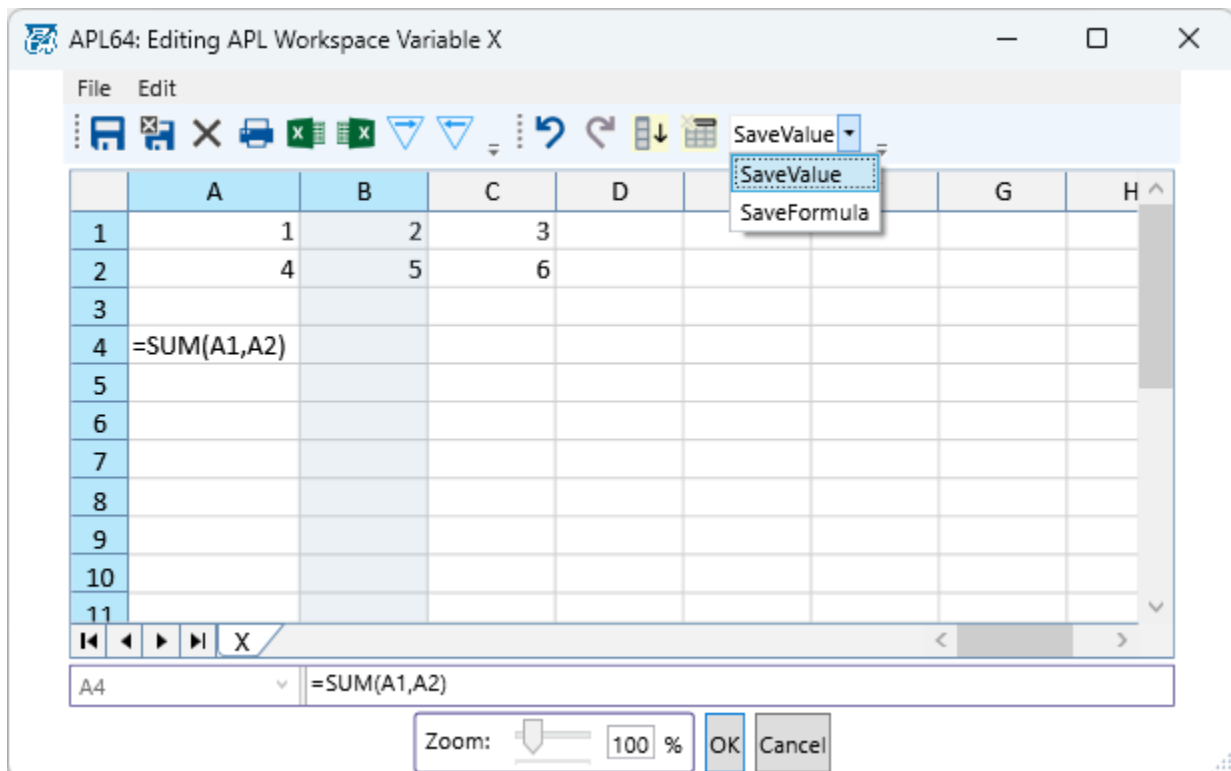
Cell Formulas

An EDSS worksheet cell can contain a user-entered Excel formula. The cell value prefix (=) indicates the cell value is a formula. A cell formula uses Excel notation.

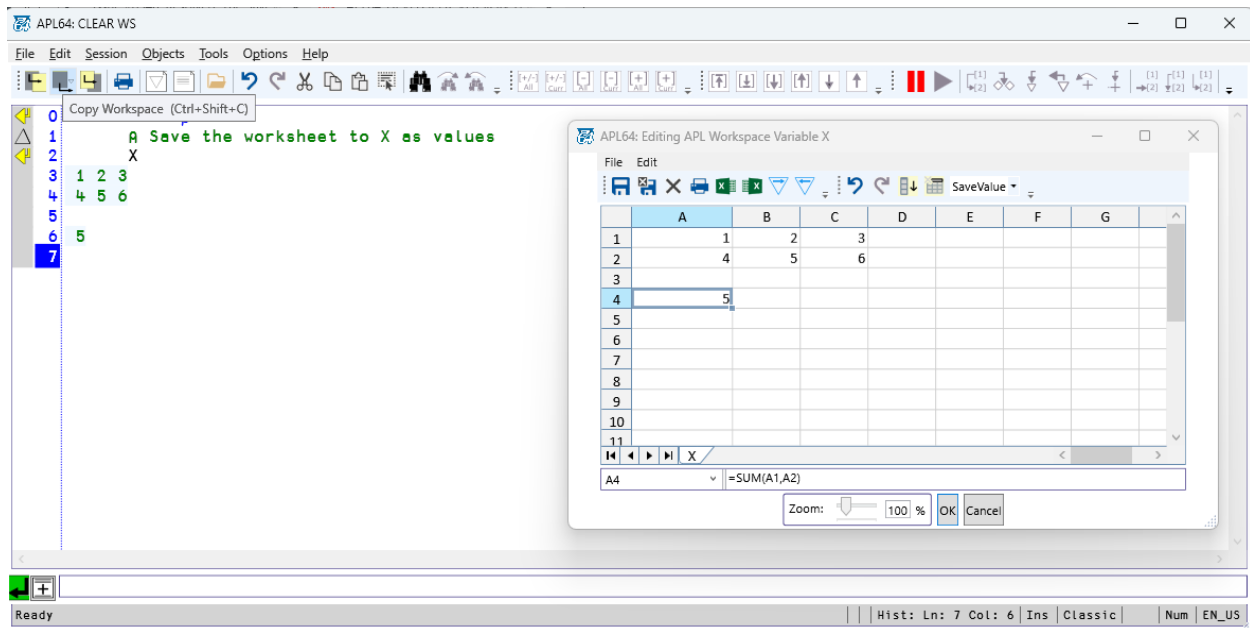
The cell formula may be entered directly into the desired cell or entered using the 'formula bar'. When the cell is in edit mode, the cell formula is visible in the cell. When the cell is in replacement mode, the evaluation of the formula is visible in the cell.

When saving an EDSS worksheet, or importing an Excel worksheet, containing one or more cell formulas to an Excel worksheet, the cell formulas are preserved.

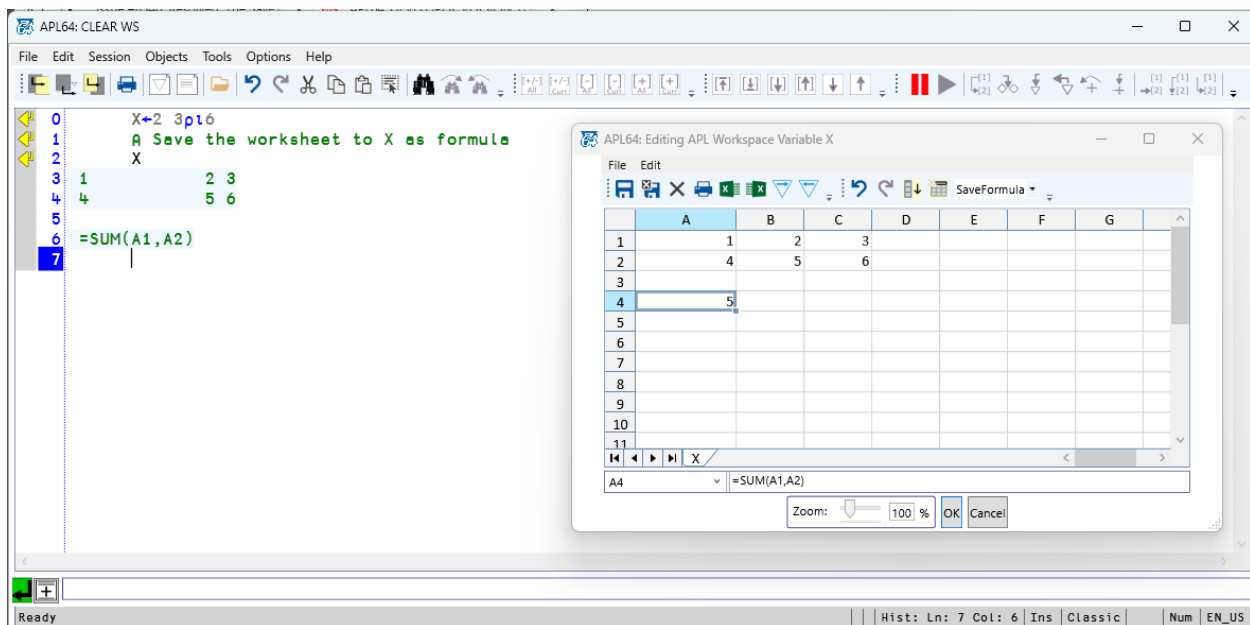
When saving an EDSS worksheet to an APL variable, an option (SaveValue/SaveFormula) is provided to save the cell values which contain a formula as the evaluated value of the cell formula or the text representation of the cell formula. The option selected applies to all cells in the workbook. The selected option is saved in the APL64 xml-format configuration file.



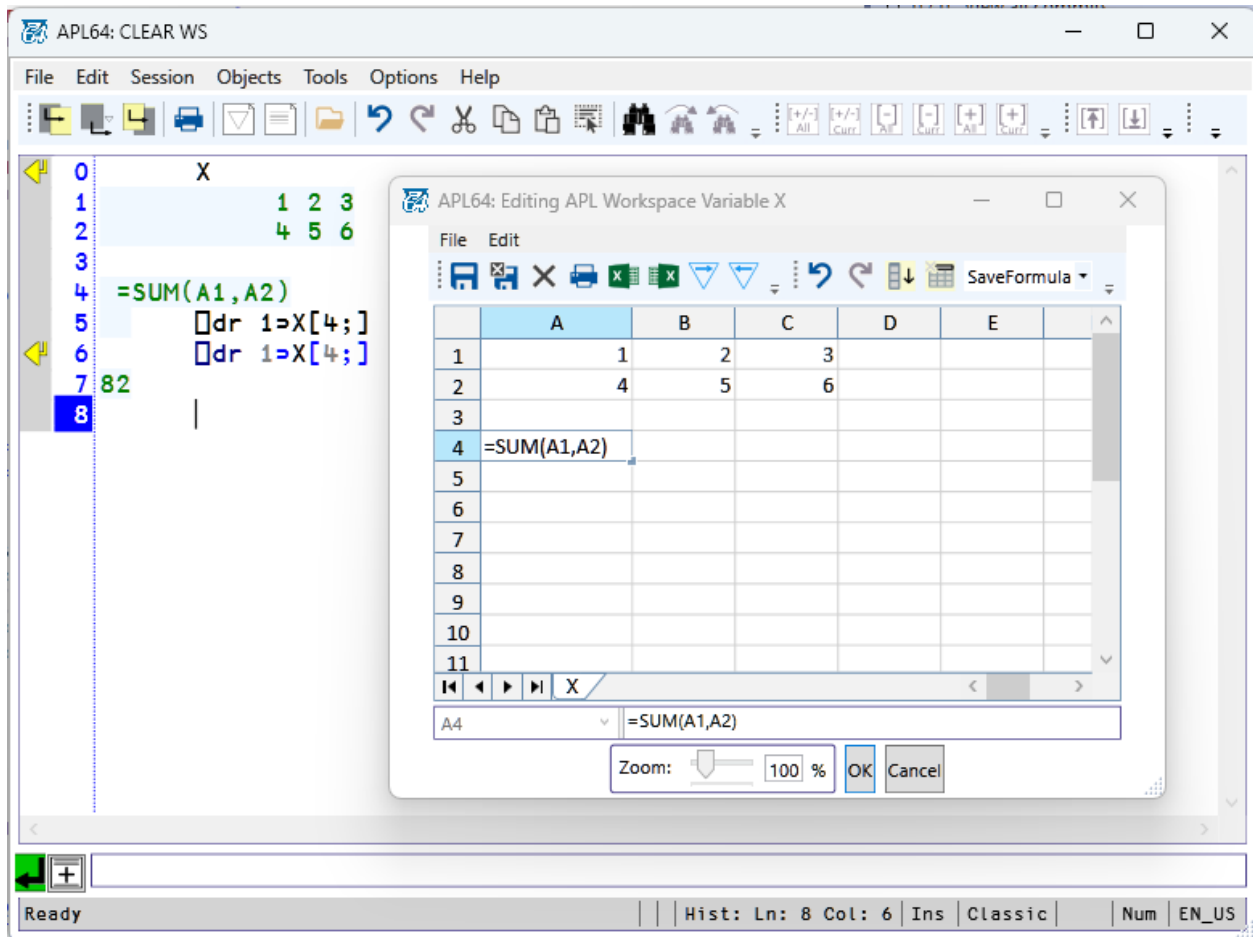
Export the worksheet to an APL64 variable as values:



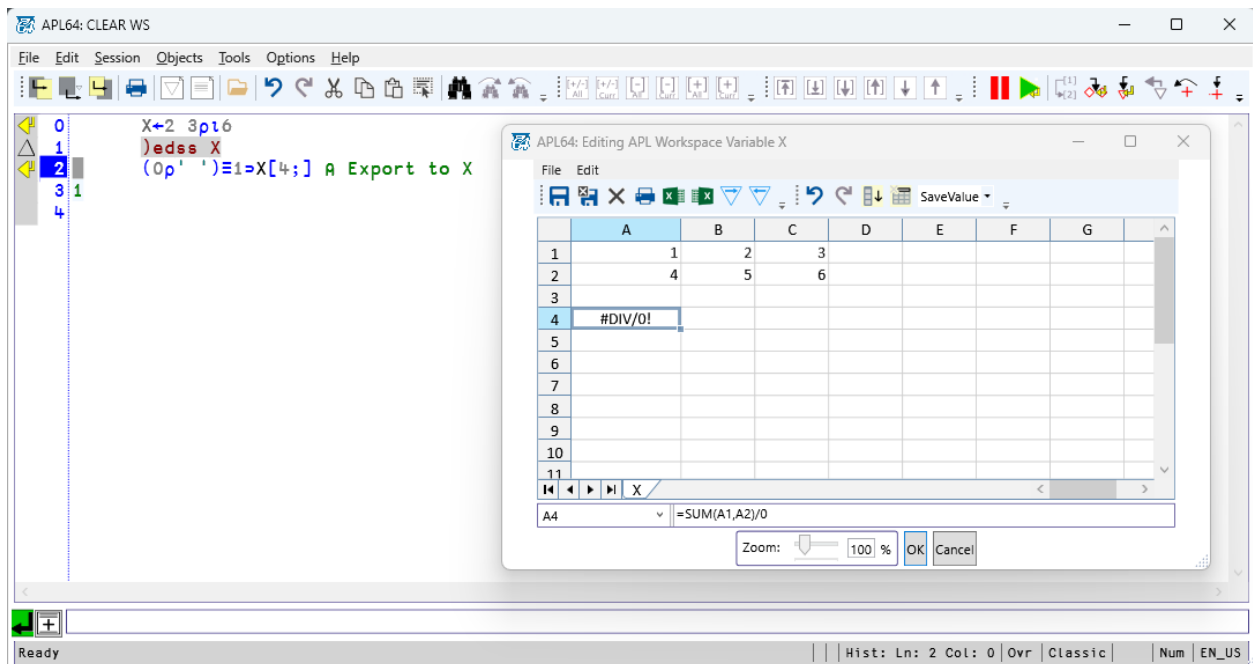
Export the worksheet to an APL64 variable as formula:



When importing an APL64 variable which contains the text representation of a formula, with the '=' prefix, the formula text will be imported to the EDSS dialog as text and operate as a formula by the ESSS dialog.



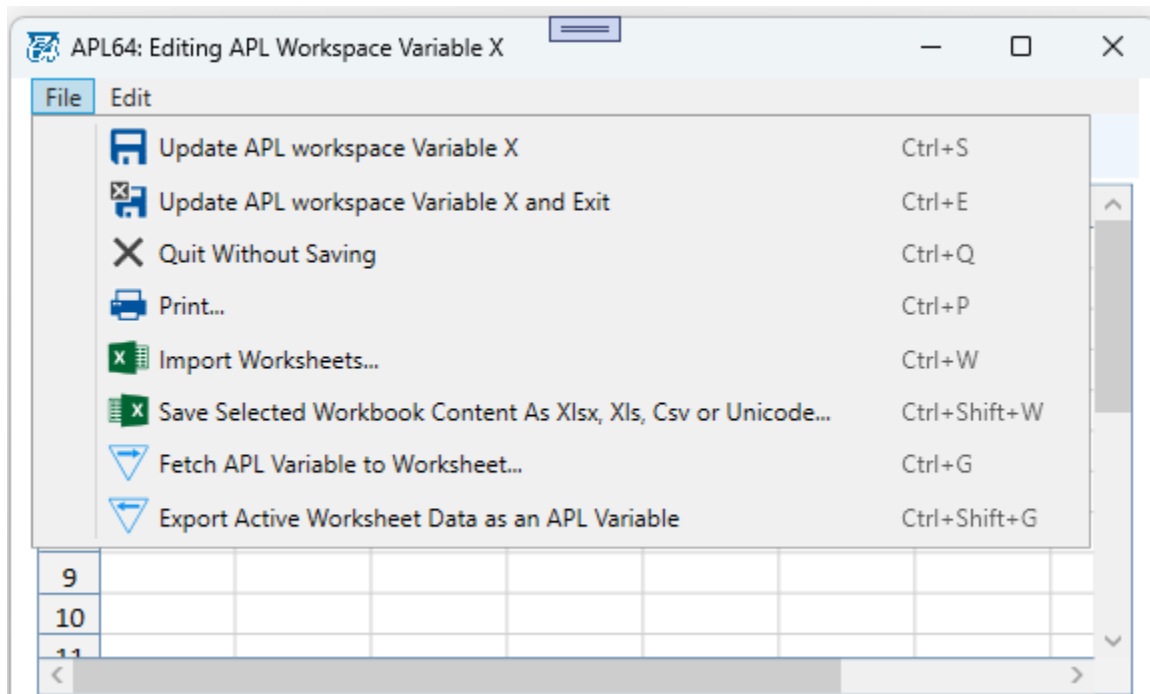
If evaluation of the cell formula is invalid, and the 'Save Value' option is selected, when the EDSS worksheet values are exported to an APL variable, the APL variable element value from the invalid cell is 0p''.



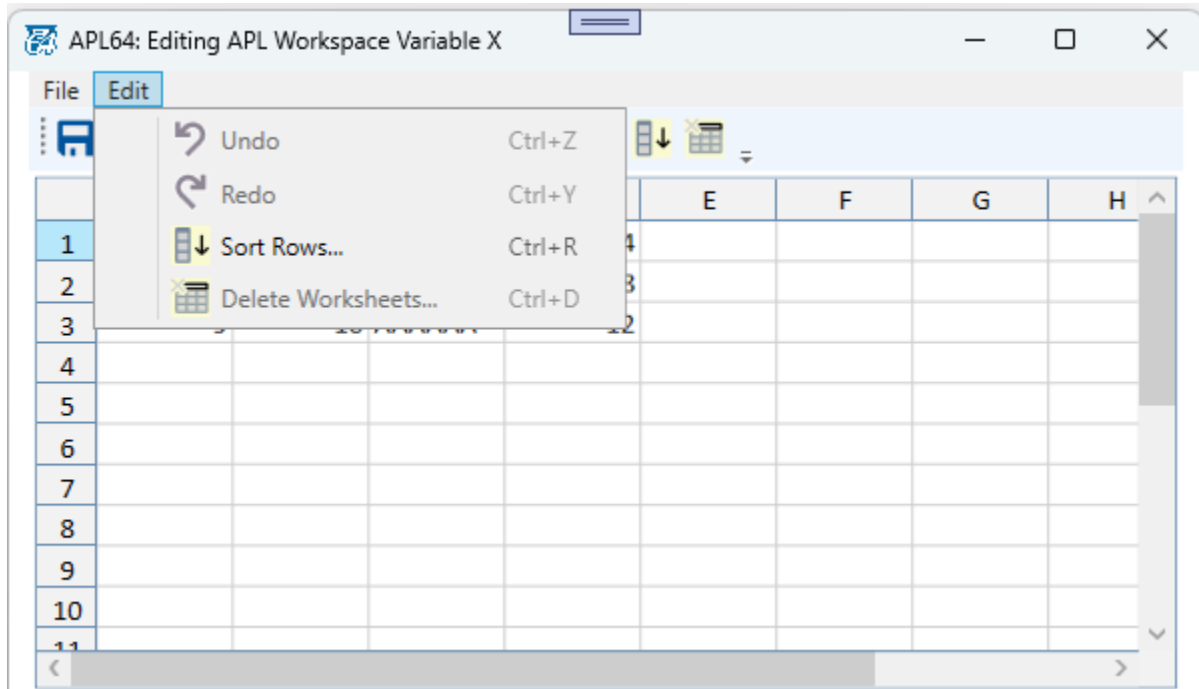
EDSS Menu Items

EDSS File Menu

Corresponding to the EDSS toolbar buttons are analogous menu items for the same functions. These menu items illustrate the keystroke short-cuts for the EDSS dialog actions:

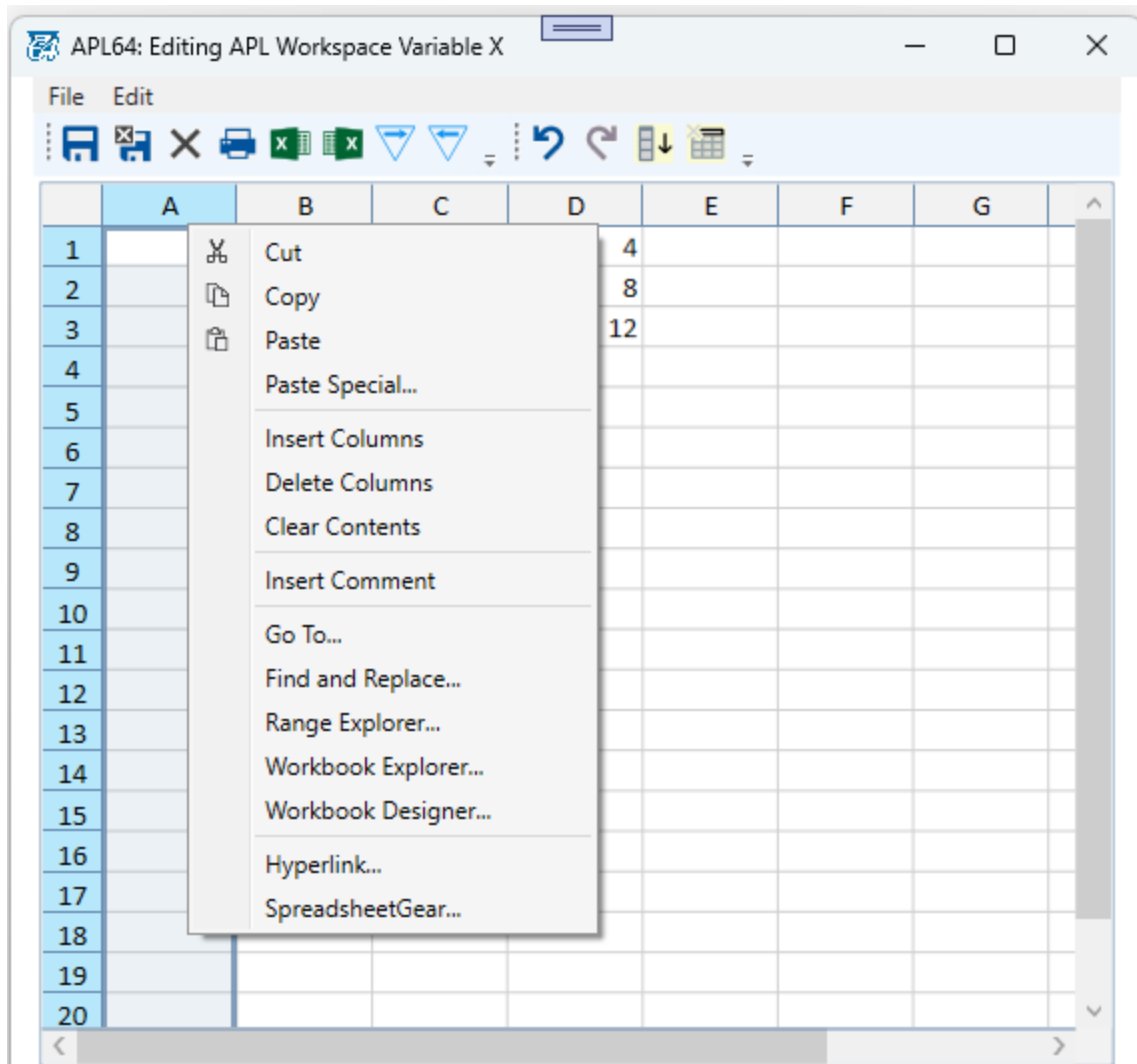


EDSS Edit Menu



EDSS Context Menu for Column Header, Row Header or Cell Content

A right mouse click on a column header, row header or cell will present a context menu.



More Examples

Edit String vs Character Vector

The screenshot shows the APL64 workspace with the following code:

```

0 DR←charV←'abcd'
1 abcd
2 82
3
4 )edss charV
5 DR←string←«abcd»
6 abcd
7 164
8
9 )edss string
10 DR←vectorOfCharVectors←'abcd' 'xyzw'
11 abcd xyzw
12 326
13 )edss vectorOfCharVectors
  
```

Below the code are three windows showing the data grids for the variables:

- Editing APL Workspace Variable charV:** A 12x6 grid with 'abcd' in row 1, column A.
- Editing APL Workspace Variable string:** A 12x6 grid with 'abcd' in row 1, column A.
- Editing APL Workspace Variable vectorOfCharVectors:** A 12x7 grid with 'abcd' in row 1, column A and 'xyzw' in row 1, column B.

Edit an Array with Mixed Datatype Elements

```

DR←Z←'abcd' 'e' 34 OVER 35 36 'pqr' OVER «pqr» ~234 1.345E-63
EDSS 'Z'
  
```

The screenshot shows the APL64 workspace with the following code:

```

0 DR←Z←'abcd' 'e' 34 OVER 35 36 'pqr' OVER «pqr» ~234 1.345E-63
1 abcd e 3.400E1
2 35 36 pqr
3 pqr ~234 1.345E-63
4 807
5
6 )EDSS 'Z'
  
```

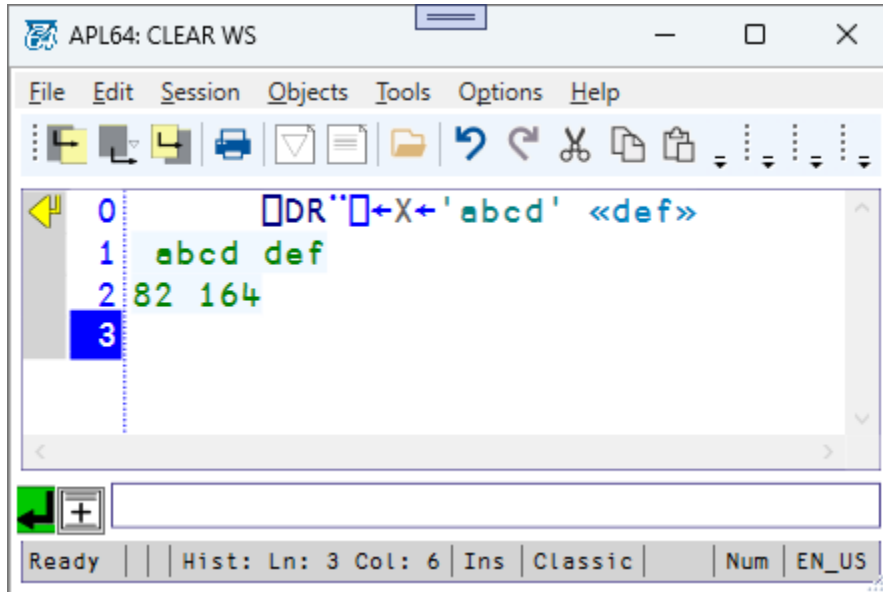
Below the code is a window titled "Editing APL Workspace Variable Z" showing a 12x7 grid with the following data:

	A	B	C	D	E	F	G
1	abcd	e	34				
2		35	36	pqr			
3	pqr		-234	1.345E-63			
4							
5							
6							
7							
8							
9							
10							
11							

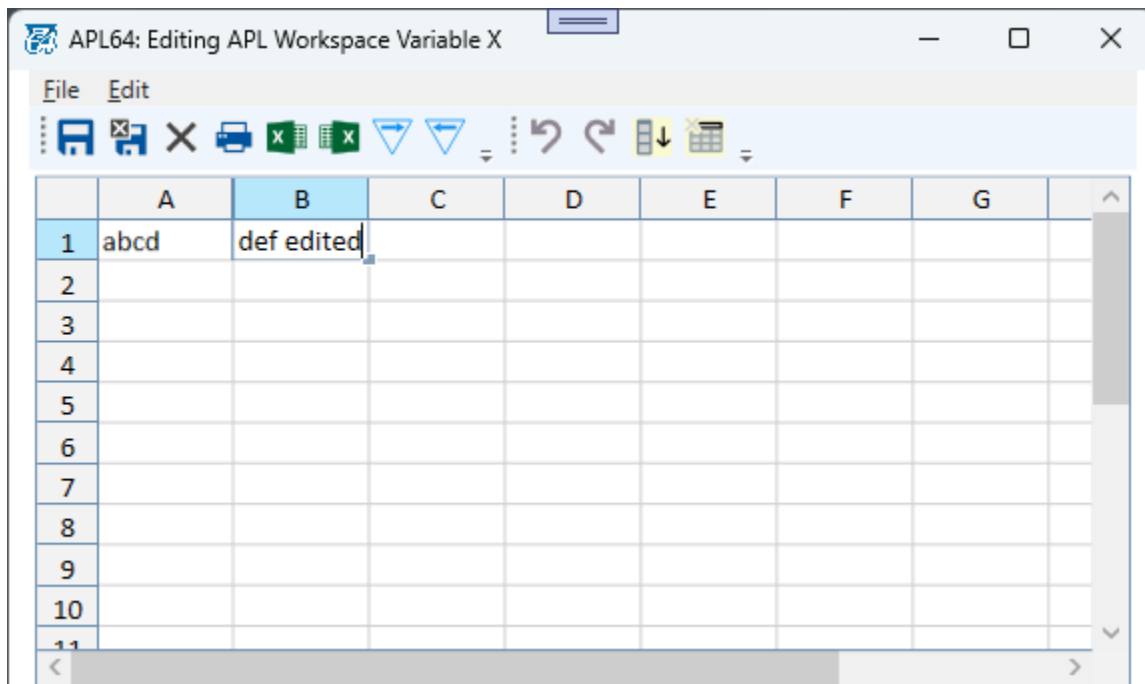
String Datatype becomes Char Vector Datatype after Editing

Because APL has traditionally used character vectors, editing an APL64 string datatype variable element, and then saving the variable back to the workspace, the element type will become character data.

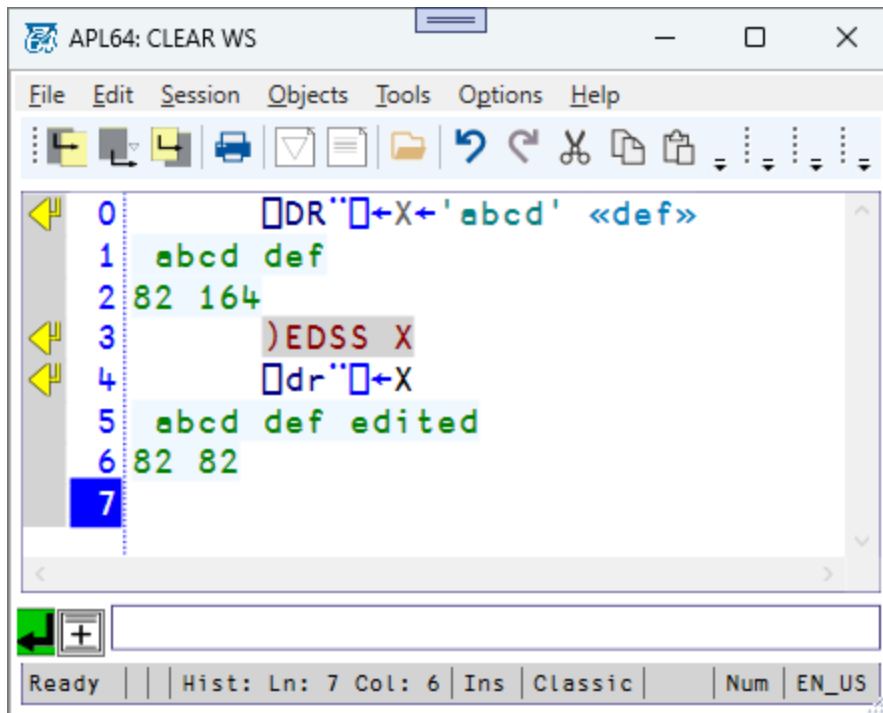
Before editing:



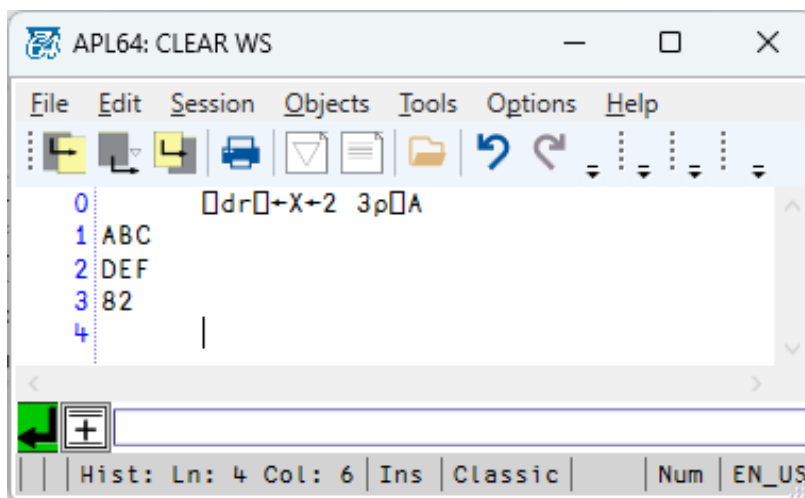
Editing an element of the APL variable in the EDSS dialog:



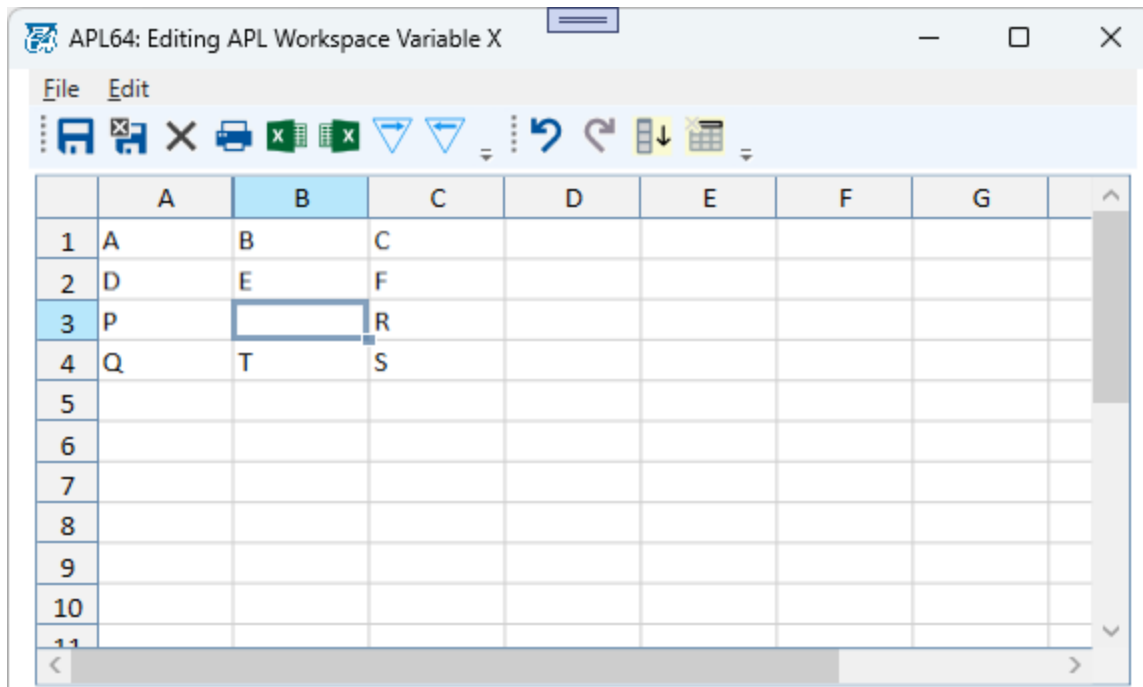
After clicking the EDSS dialog OK button:



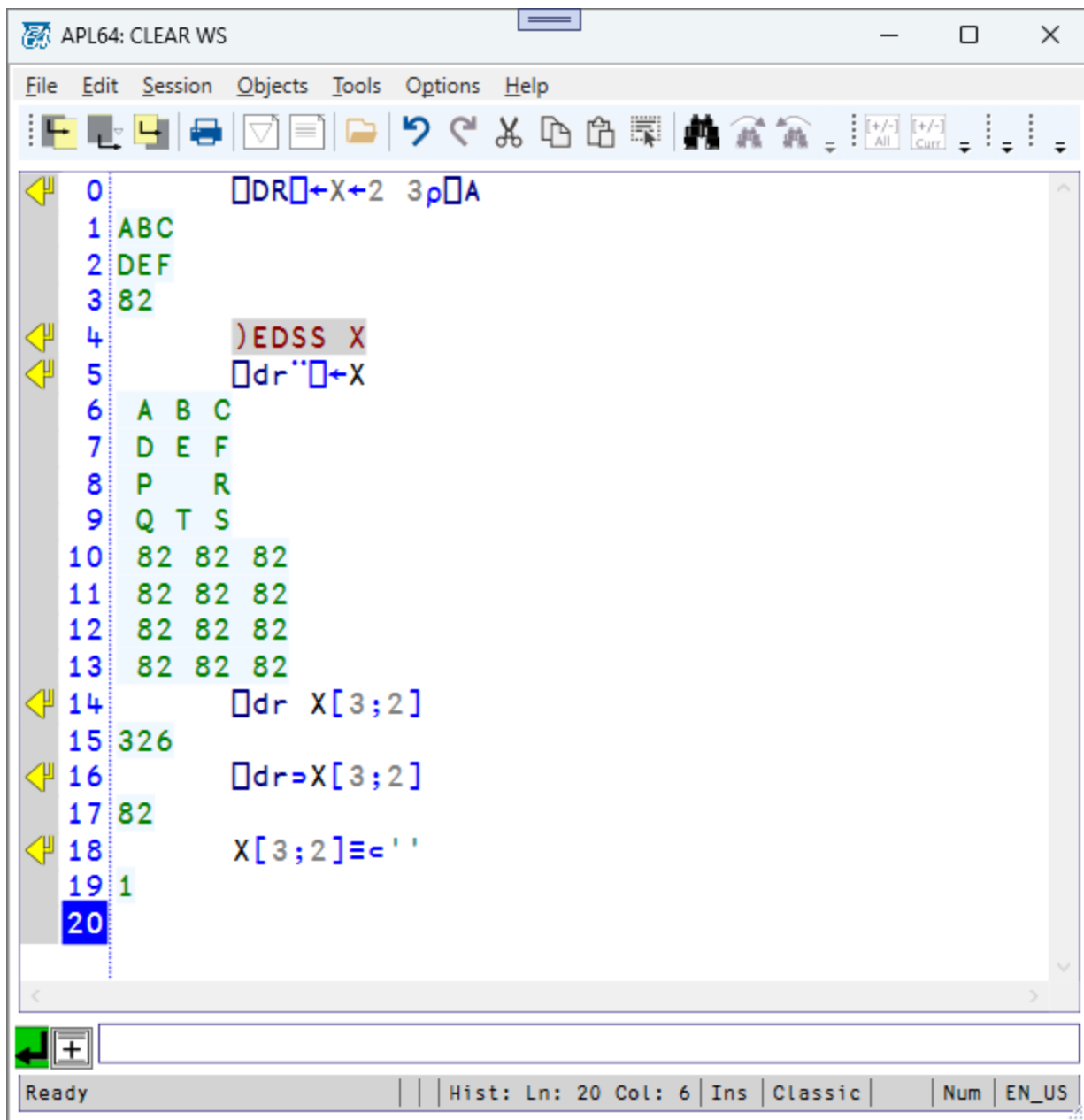
Used Range with Empty Cells will become Empty Character Value (C"")
Before editing:



Editing in the EDSS dialog so there is an empty cell (B3) within used range:

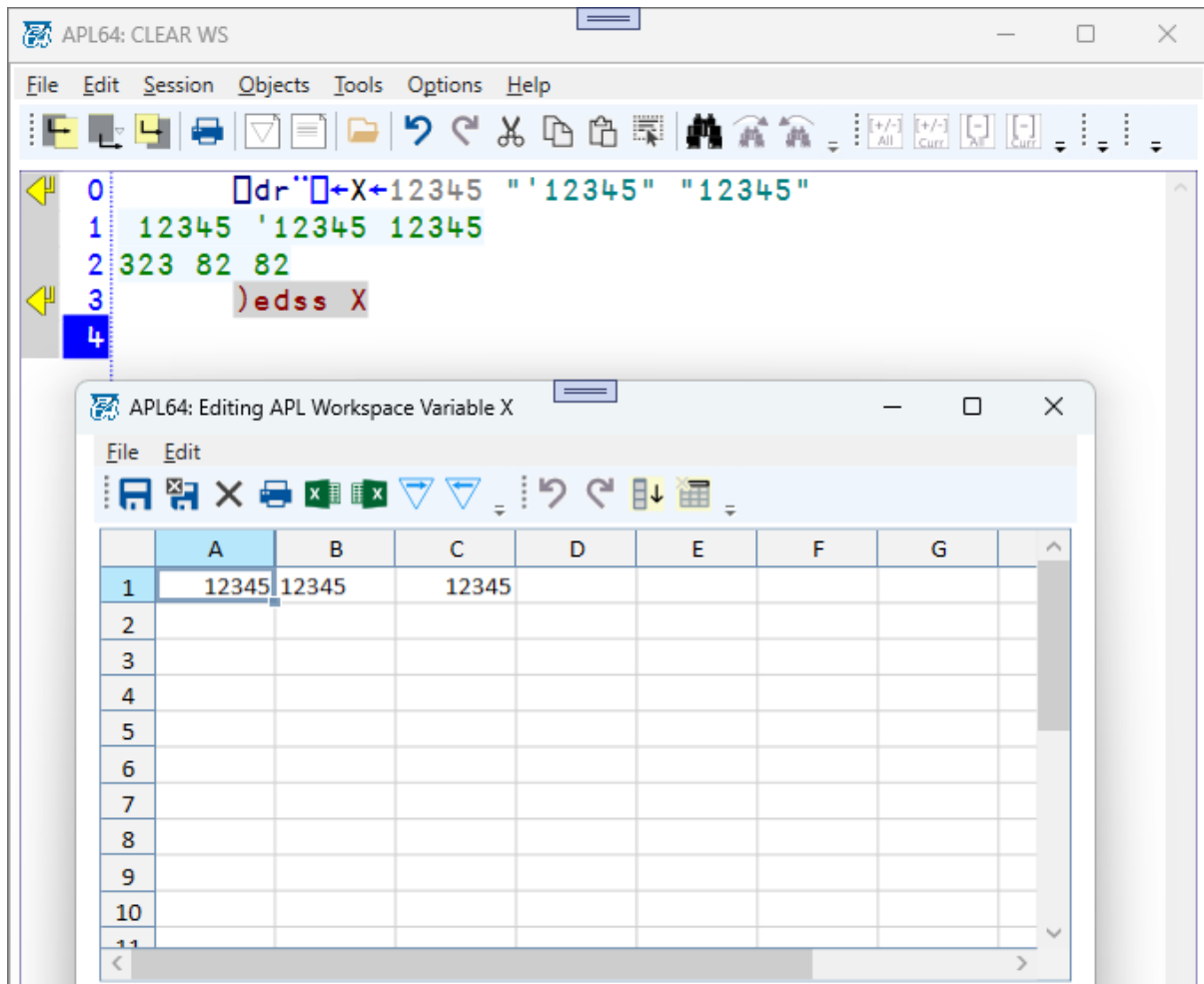


After closing the editor to update the variable:

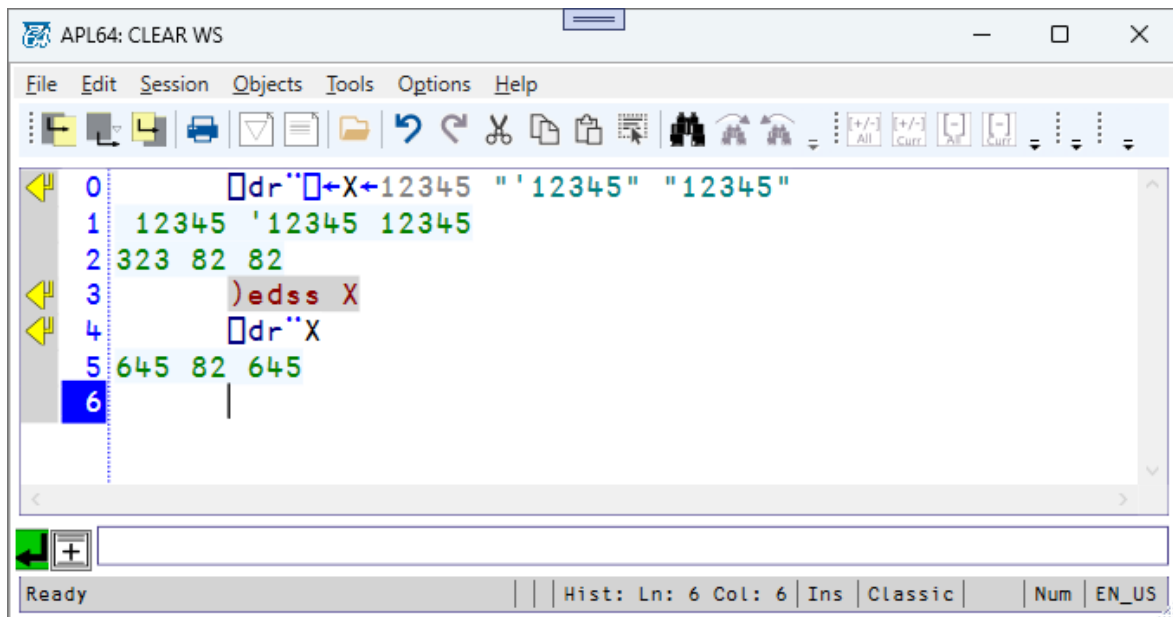


Entering Numeric or Text Values in an EDSS Dialog Cell

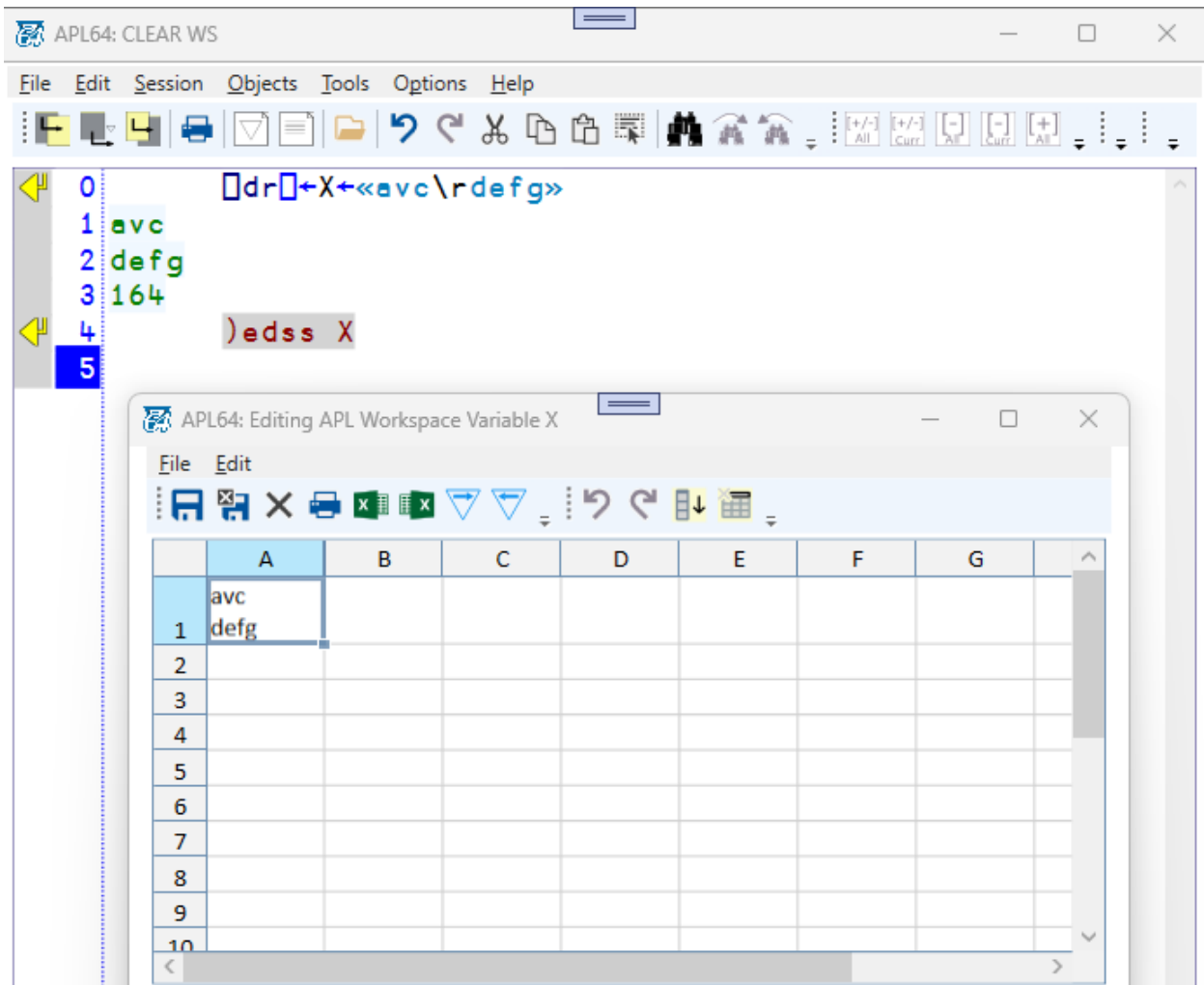
- Numeric values are right-aligned
- Text values are left-aligned
- Single quote prefix is elided in the EDSS dialog cell
- Numeric text will remain text after editing, if the text is preceded by a single quote



After closing the editor with the 'OK' button, to save the data to the workspace:



Edit Text Variable Containing Control Character(s)



APL64: CLEAR WS

File Edit Session Objects Tools Options Help

0 `dr←X←1p='avc',tcl,'defg'`

1 `avc`

2 `defg`

3 `326`

4 `)edss X`

5

APL64: Editing APL Workspace Variable X

File Edit

	A	B	C	D	E	F	G	
1	avc							
2	defg							
3								
4								
5								
6								
7								
8								
9								
10								

APL64: CLEAR WS

File Edit Session Objects Tools Options Help

0 dr←X←'avc',⊂tcl,'defg'

1 avc

2 defg

3 82

4)edss X

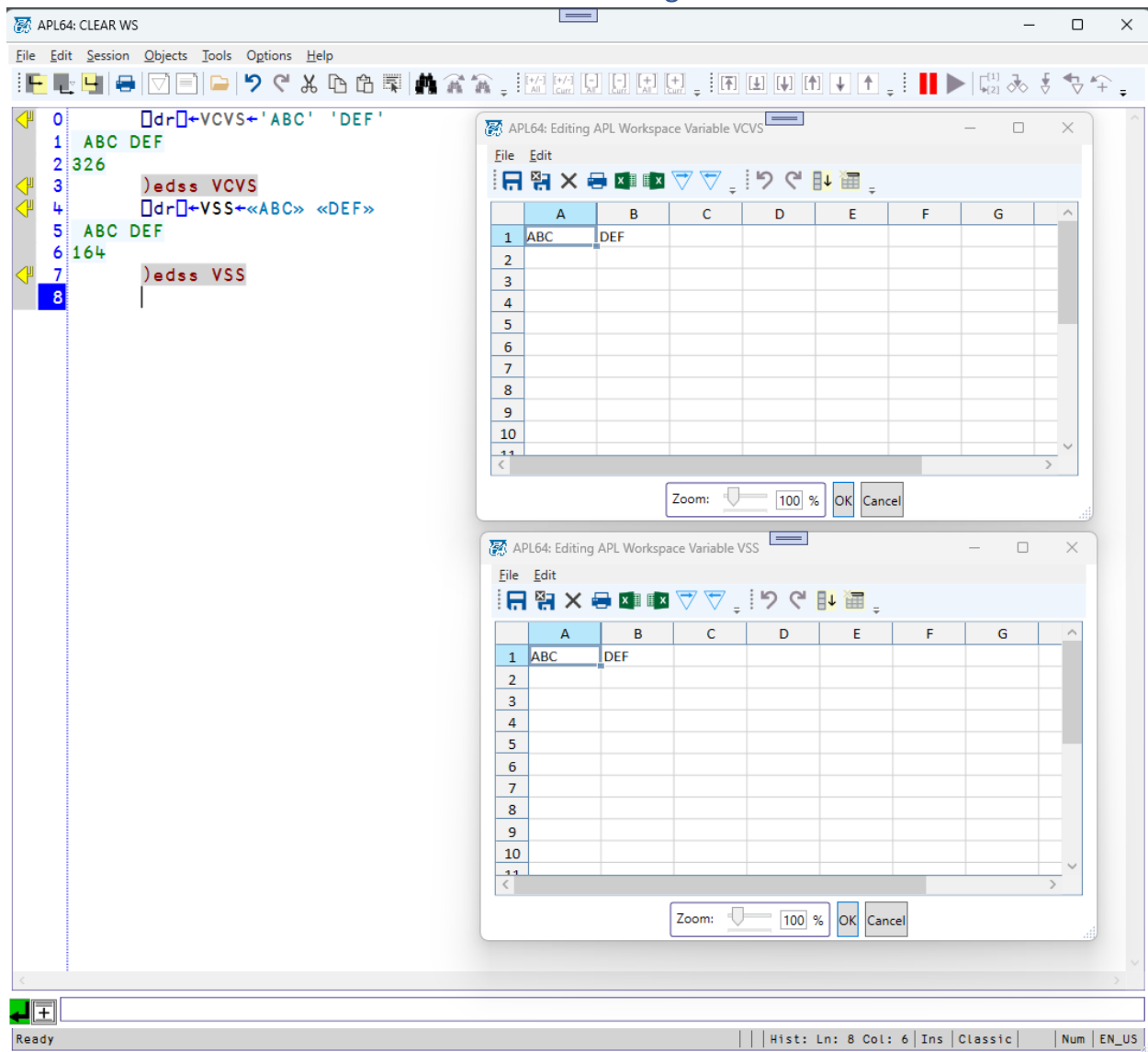
5

APL64: Editing APL Workspace Variable X

File Edit

	A	B	C	D	E	F	G	
1	a	v	c		d	e	f	g
2								
3								
4								
5								
6								
7								
8								
9								
10								

Edit Vector of Character Vectors and Vector of Strings



Resulting Shape and Rank may be different than Original Shape or Rank

After closing the editor, check the shape and rank:

The screenshot shows the APL64: CLEAR WS window with the following content:

```
0      dr←VCVS←'ABC' 'DEF'
1  ABC DEF
2  326
3      )edss VCVS
4      dr←VSS←«ABC» «DEF»
5  ABC DEF
6  164
7      )edss VSS
8      dr←VCVS⊙pVCVS
9  ABC DEF
10 326
11 2
12     dr←VSS⊙pVSS
13 ABC DEF
14 326
15 2
16
```

The status bar at the bottom indicates: Ready | Hist: Ln: 16 Col: 6 | Ins | Classic | Num | EN_US