

# Quote-Quad and Quad in APL64

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## Summary

Quad (□) and Quote-Quad (□) are APL64 glyphs associated with input and output behaviors that apply to the APL64 Developer version. This document describes the uses of Quote-Quad input, Quote-Quad output, Quad input, Quad output, □QQDEFAULT and □QQO.

There are some differences and behavior of Quad input, Quote-Quad input and `⎕QQDefault` in APL64 compared to legacy versions of APL. Continue reading this document for details.

## Quote-Quad Input: `←⎕`

Quote-Quad input obtains character input from a query presented to the user of the APL64 Developer version.

### Quote-Quad Input Dialog

- Quote-Quad input statement presents the modal Quote-Quad Input dialog
- User input may be manually entered or pasted into the dialog's Textbox
- The dialog accepts Unicode glyphs
- The Alt+ and Alt+Shift keyboard modifiers are active so APL64 glyphs may be entered manually
- Clicking the Enter/Return/Escape key or left mouse clicking the dialog's close button (×) closes the dialog
- The result of Quote-Quad input is a character vector.
- The result of Quote-Quad input may be assigned to an APL64 variable
- The break button and the )Reset and )Clear system commands do not interrupt Quote-Quad input.
- The APL64 Virtual Keyboard actions do not affect Quote-Quad input
- The size and location of the Quote-Quad dialog is user-controlled
- Quote-Quad input applies only to the APL64 developer version
- When the dialog is presented and a default response is provided by `⎕qqdefault`:
  - The default response is not selected
  - The cursor is placed at the end of the default response

When the Quote-Quad input dialog is closed:

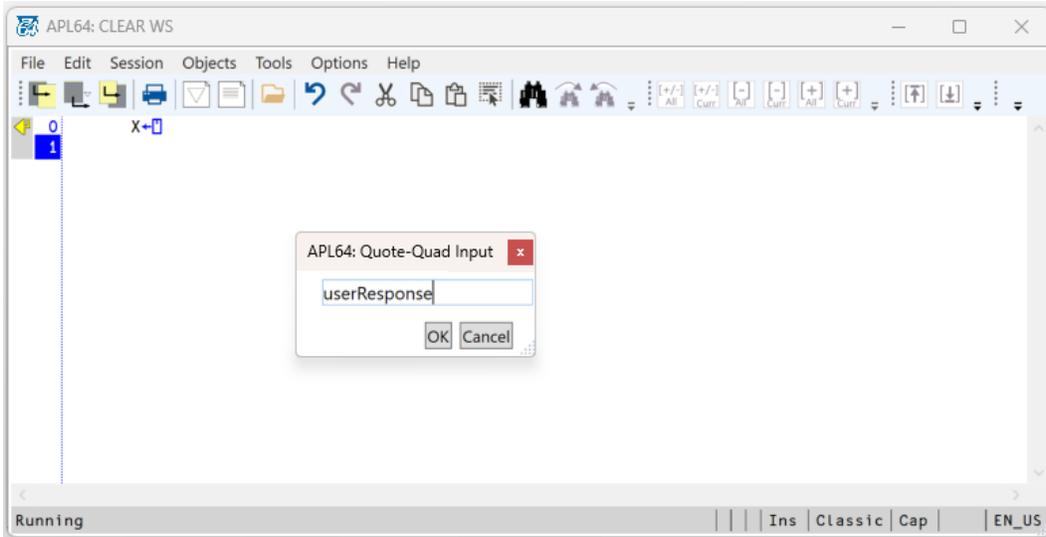
- The Quote-Quad output prompt, if any, and the user response (result of Quote-Quad input) are rendered to the history pane of the APL64 developer version instance.
- The result of Quote-Quad input is available for assignment. If the result of Quote-Quad input is not assigned to an APL64 variable, the output is rendered to the history pane of the APL64 Developer version

### Basic Quote-Quad Input

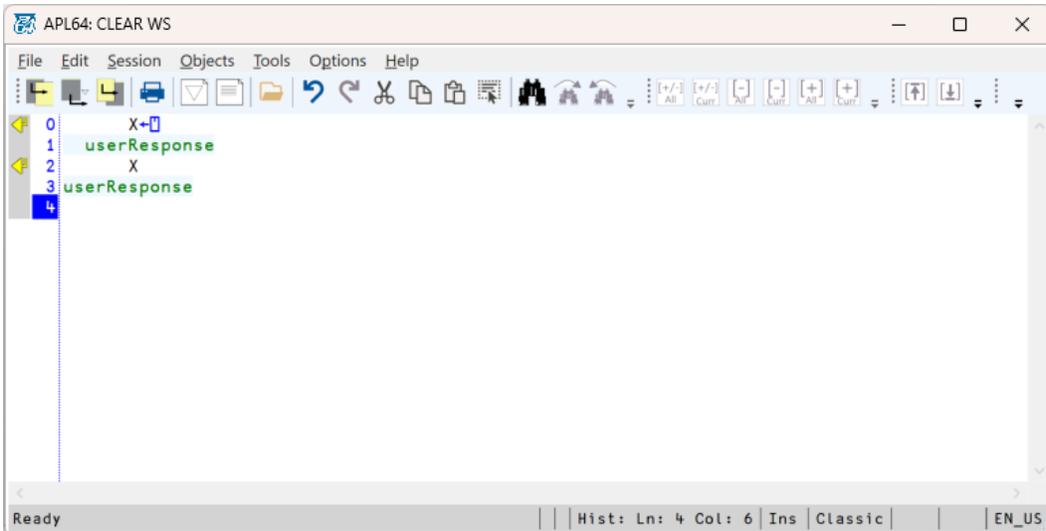
```
X←⎕
```

When this statement is executed the Quote-Quad input dialog is presented. The user may enter an appropriate text value and close the dialog to complete the query:

Before the user closes the Quote-Quad dialog:



After the user closes the Quote-Quad dialog:

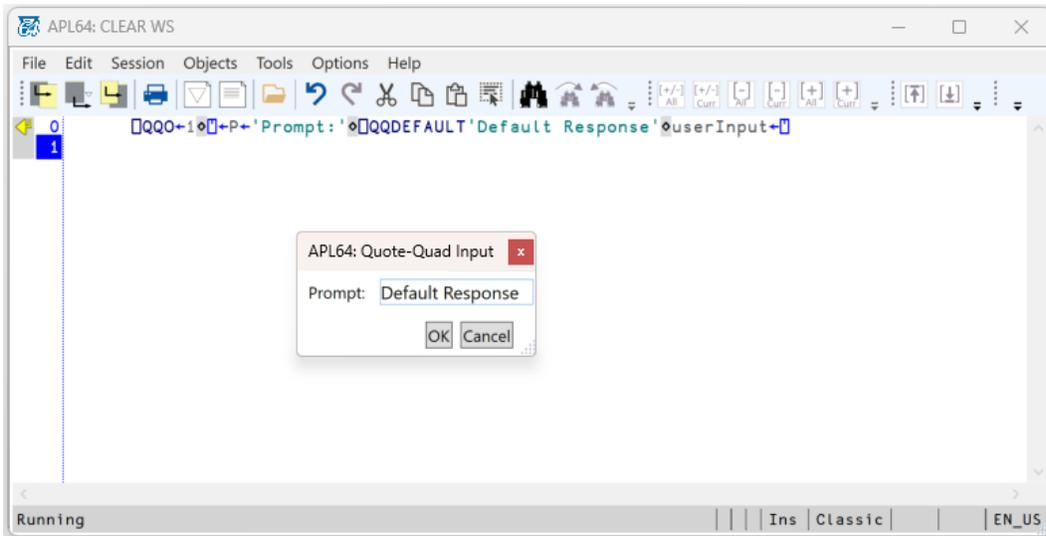


## Enhanced Quote-Quad Input

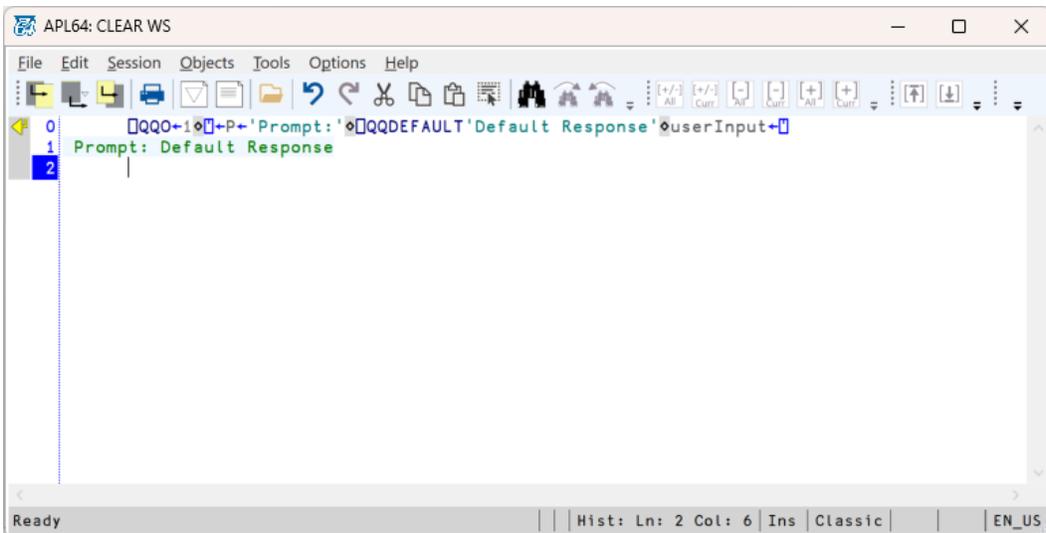
Quote-Quad input can be enhanced using Quote-Quad output to set a prompt text and `⎵QQDefault` to set a default response text. The APL64 `⎵QQO` system variable is set to 1 to suppress spurious Quote-Quad output to the history pane.

```
⎵QQO←1⎵⎵←P←'Prompt:'⎵⎵QQDEFAULT'Default Response'⎵userInput←⎵
```

Before the user closes the Quote-Quad dialog:



After the user closes the Quote-Quad dialog:



## Quote-Quad Input when the `⊞QQDefault` 'buffer' contains `⊞TCNL`

If the `⊞QQDefault` 'buffer' contains one or more `⊞tcnl` characters, the default response to a Quote-Quad query will be the 'buffer' text up to the first `⊞tcnl` character in the 'buffer' or the entire 'buffer' text if the 'buffer' does not contain `⊞tcnl`. If the 'buffer' contains `⊞tcnl`, the Quote-Quad query will not be presented, and the default value will be the result value of the query. The remainder of the `⊞QQDefault` 'buffer', if any, will be used by subsequent Quad or Quote-Quad queries.

```

⊞QQDefault '3+5',⊞tcnl,'0.001+i6',⊞tcnl,'"abc","pqr"'
⊞←'Enter X:'
X←⊞
⊞←'Enter Y:'
Y←⊞

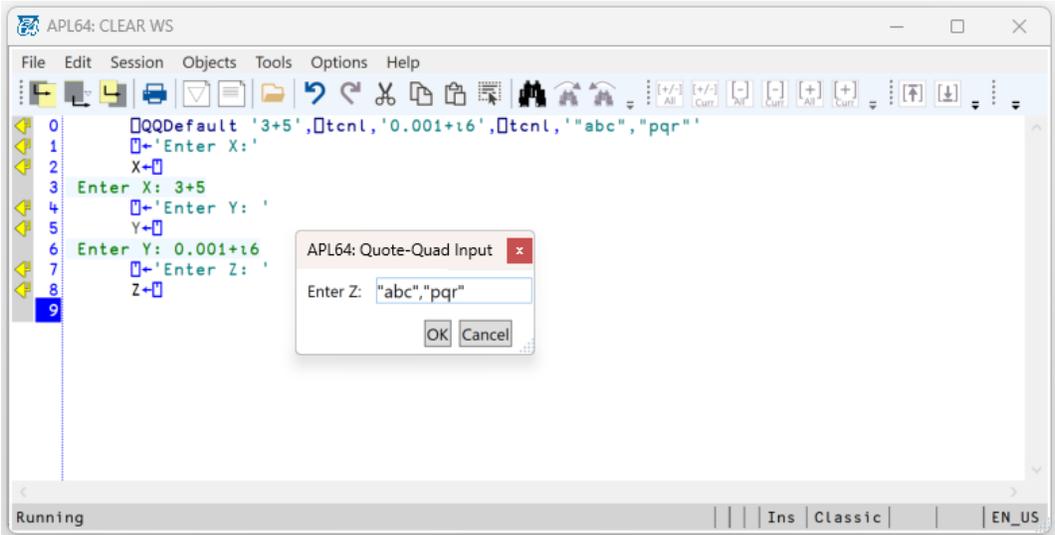
```

```

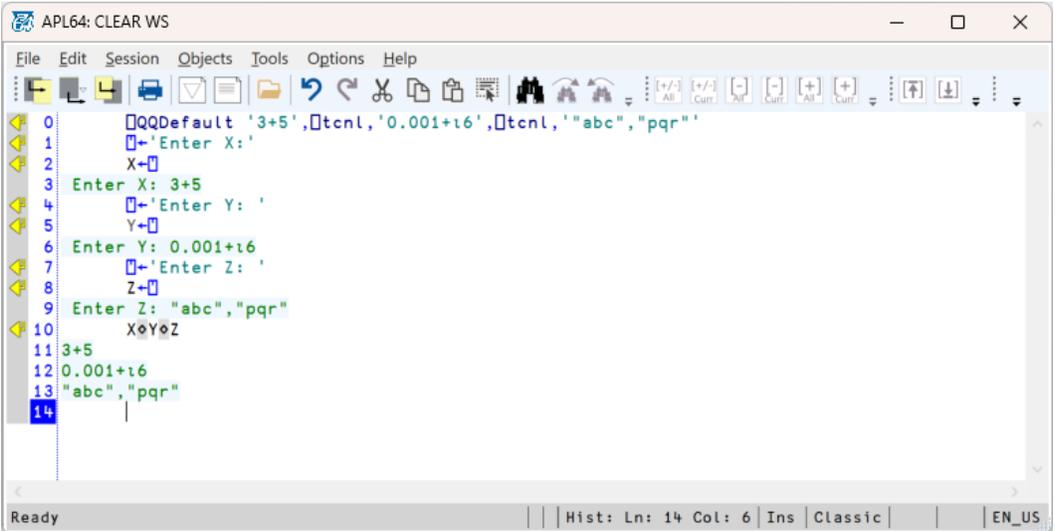
□←'Enter Z: '
Z←□
X⊙Y⊙Z

```

Before the user closes the Quad Input dialog:



After the user closes the Quad input dialog:



## Quad Input: ← □

Quad input obtains the value of the interpreter-processed character input from the user of the APL64 Developer version.

## Quad Input Dialog

- Quad input statement presents the modal Quad Input dialog
- User input may be manually entered or pasted into the dialog's Textbox
- The Quad input dialog accepts Unicode glyphs
- The Alt+ and Alt+Shift keyboard modifiers are active so APL64 glyphs may be entered manually
- Clicking the Enter/Return/Escape key or left mouse clicking the dialog's close button (×) closes the dialog and outputs the value of the interpreter-processed user-entered text
- If the interpreter processing of the user-entered text results in an exception, the dialog remains active until an interpreter-executable text is entered by the user.
- If the interpreter evaluation of the user-entered text does not produce a result, the dialog remains active until interpreter evaluation of the user input has a result.
- The output of Quad input may be assigned to an APL64 variable.
- The break button and the )Reset / )Clear system commands do not interrupt Quad input.
- The APL64 Virtual Keyboard actions do not affect Quad input.
- The size and location of the Quote-Quad dialog is user-controlled
- Quote-Quad input applies only to the APL64 developer version
- When the dialog is presented and a default response is provided by `⎕qqdefault`:
  - The default response is not selected
  - The cursor is placed at the end of the default response

When the Quad dialog is closed:

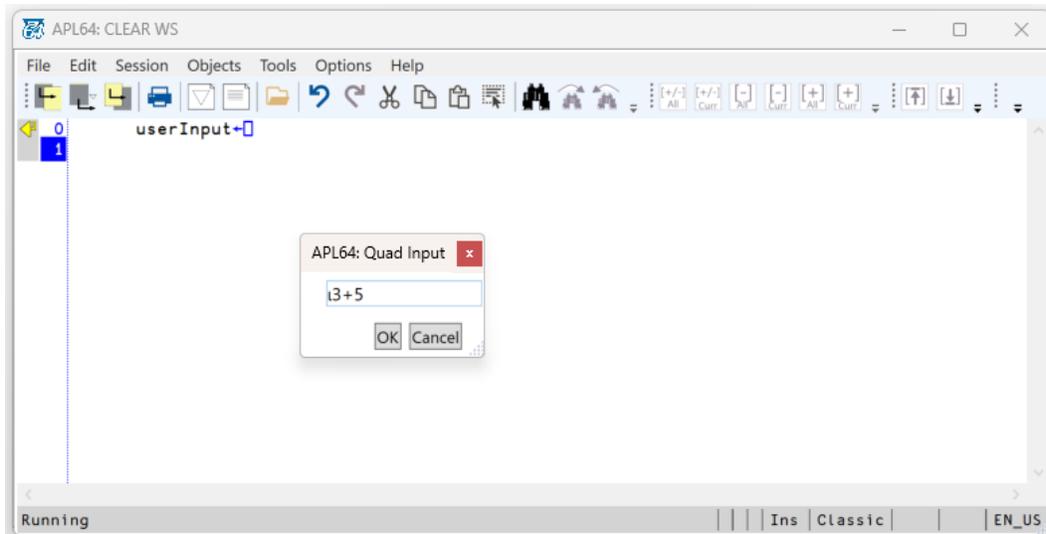
- The Quad output prompt, if any, and the result of the user response (result of Quad input) are rendered to the history pane of the APL64 developer version instance.
- The result of Quad input is available for assignment. If the result of Quad input is not assigned to an APL64 variable, the output is rendered to the history pane of the APL64 Developer version

## Basic Quad Input

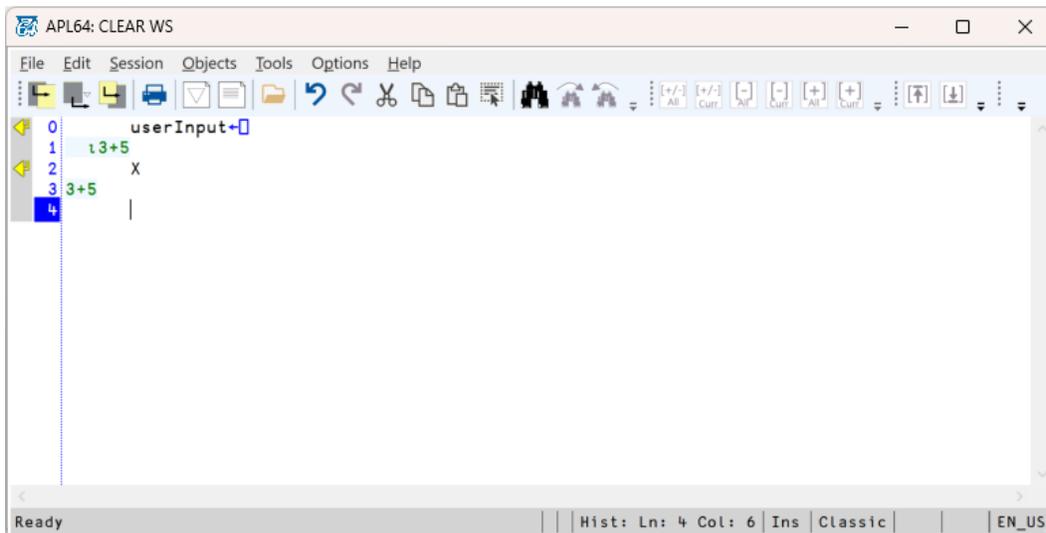
```
userInput←⎕
```

When this statement is executed in the APL64 developer version, the Quad input dialog is presented. The user may enter an appropriate text value and close the dialog.

Before the user closes the Quad input dialog:



After the user closes the Quad input dialog:

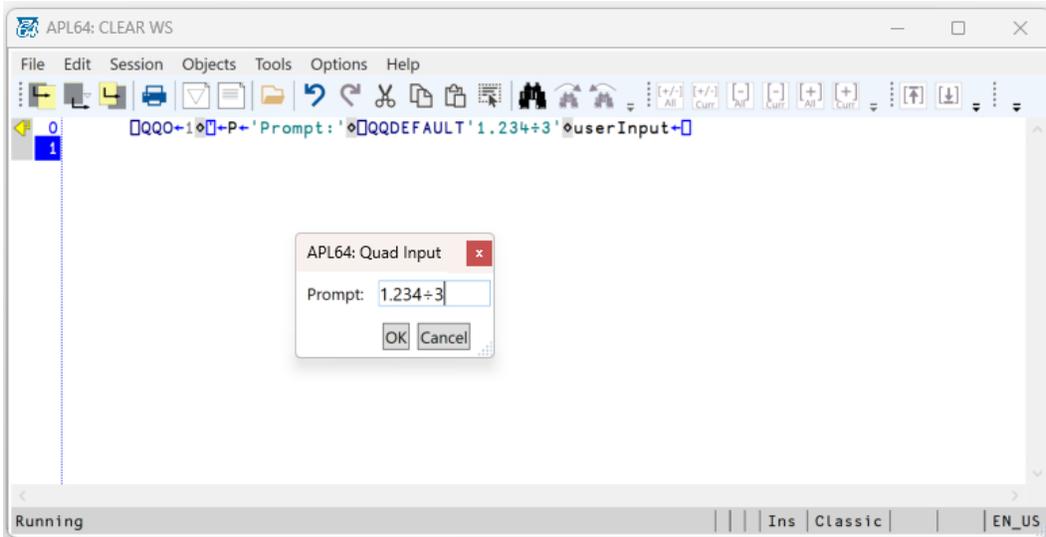


## Enhanced Quad Input

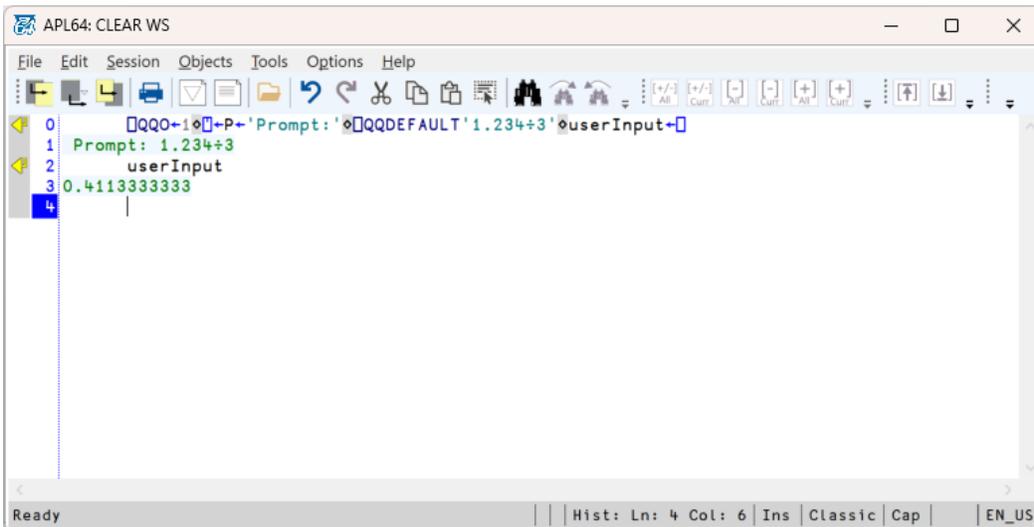
Quad input can be enhanced using Quote-Quad output to set a prompt text and `QQDefault` to set a default response text. The APL64 `QQO` system variable is set to 1 to suppress spurious Quote-Quad output to the history pane.

```
⎕QQO←1 ⎕P←'Prompt:' ⎕QQDEFAULT'1.234÷3' ⎕userInput←
```

Before the user closes the Quad input dialog:



After user closes the Quad Input dialog:



## Quad Input when the `⎕QQDefault` 'buffer' contains `⎕TCNL`

If the `⎕QQDefault` 'buffer' contains one or more `⎕tcnl` characters, the default response to a Quad query will be the 'buffer' text up to the first `⎕tcnl` character in the 'buffer' or the entire 'buffer' text if the 'buffer' does not contain `⎕tcnl`. If the 'buffer' contains `⎕tcnl`, the Quad query will not be presented and the default value will be the result value of the query. The remainder of the `⎕QQDefault` 'buffer', if any, will be used by subsequent Quad or Quote-Quad queries.

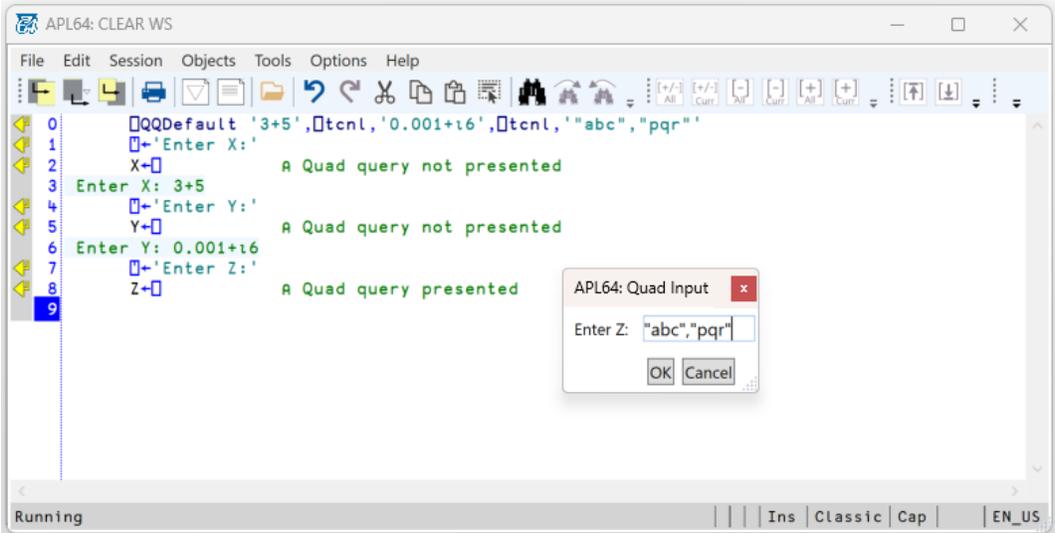
```

⎕QQDefault '3+5',⎕tcnl,'0.001+i6',⎕tcnl,'"abc","pqr"'
⎕←'Enter X:'
X←⎕      Ⓞ Quad query not presented
⎕←'Enter Y:'
Y←⎕      Ⓞ Quad query not presented
⎕←'Enter Z:'
Z←⎕      Ⓞ Quad query presented

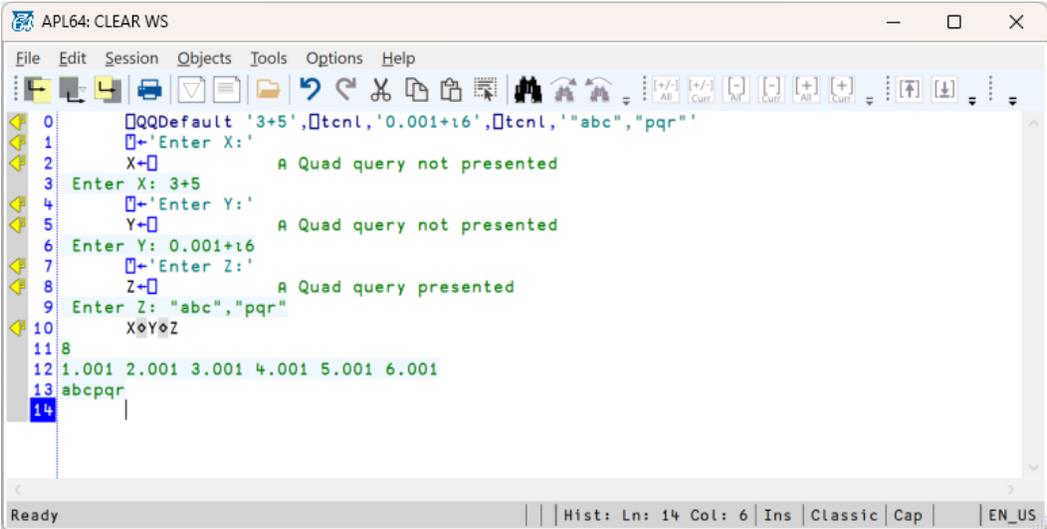
```

X⊙Y⊙Z

Before the user closes the Quad Input dialog:



After the user closes the Quad input dialog:



## Restricted User Responses to Quad Input

To exit the Quad input state, the user entry to the prompt must yield a result when evaluated by the interpreter.

User responses to a Quad input prompt which include certain APL actions are not supported, including:

All system commands are allowed except:

)CLEAR

)COPY

)LOAD

)OFF

)PCOPY

)RESET

)SIC

)WCOPY

)WLOAD

)WPCOPY

)WXLOAD

)XLOAD

Branch is not allowed if it exits the []ASKEX or Quad input context, but a branch is allowed inside functions called by the executed user-provided expression.

User commands and edit directives starting with del or # are not allowed, but )EDIT can be used.

System functions not allowed:

COPY

LOAD

PCOPY

QLOAD

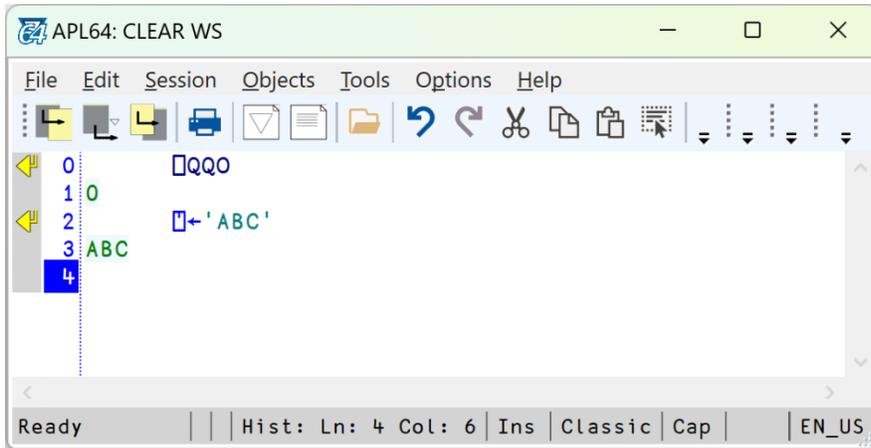
XLOAD

## Quote-Quad Output: ←

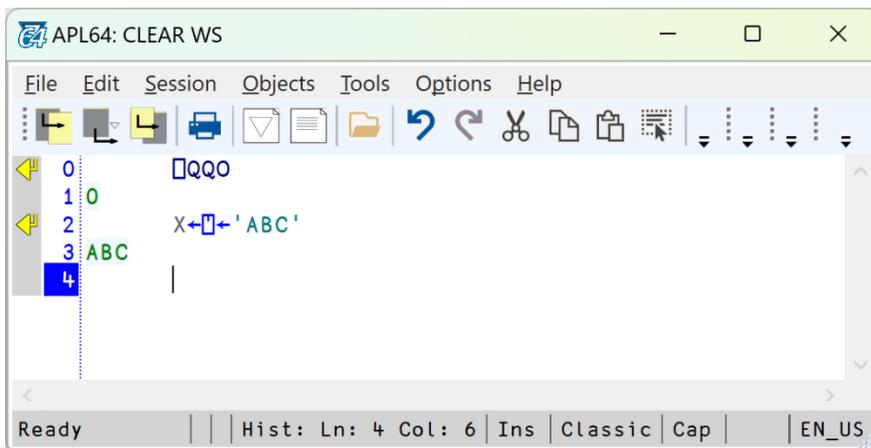
Quote-Quad output may be assigned to an APL variable.

## Render Text to History

When the value of the APL64 QQO system variable is 0 (legacy APL behavior of Quote-Quad output), Quote-Quad output may be used to render text to the history pane of the APL64 Developer version:



The legacy APL behavior of Quote-Quad output in APL64 will render output to the history pane even if the Quote-Quad output is assigned to an APL variable:

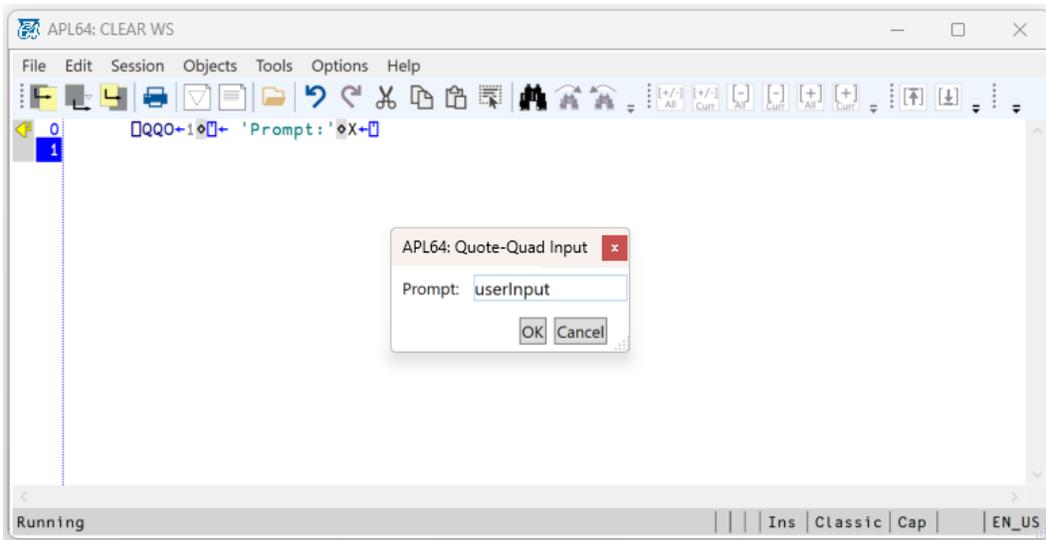


## Set Prompt for Quad Input or Quote-Quad Input

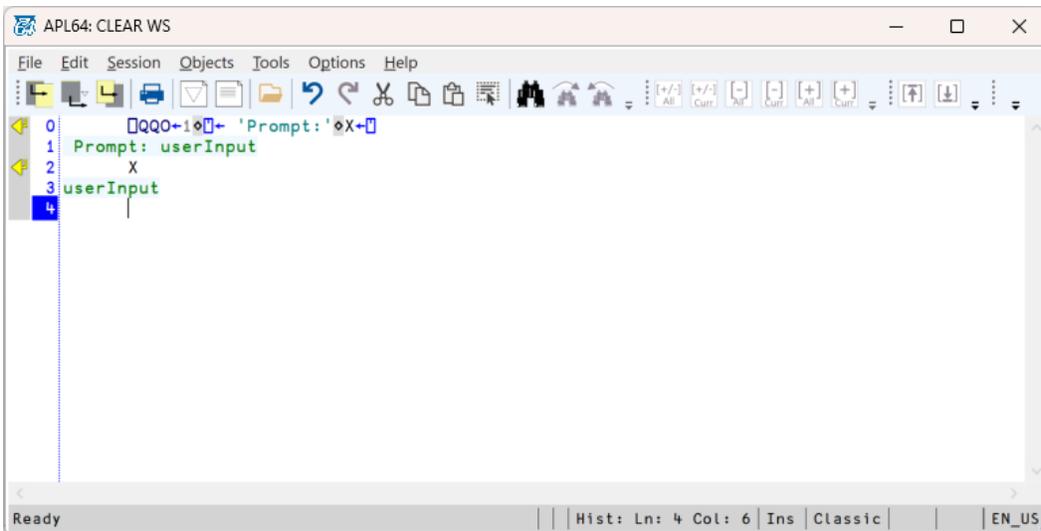
Quote-Quad output may be used to set the prompt for Quad input or Quote-Quad input. When the APL64 `⎕QQO` system variable value is 1, spurious Quote-Quad output to the history will be avoided:

```
⎕QQO←1⋄⎕←'Prompt: '⋄X←⎕
```

Before the user closes the Quote-Quad dialog:



After the user closes the Quote-Quad dialog:



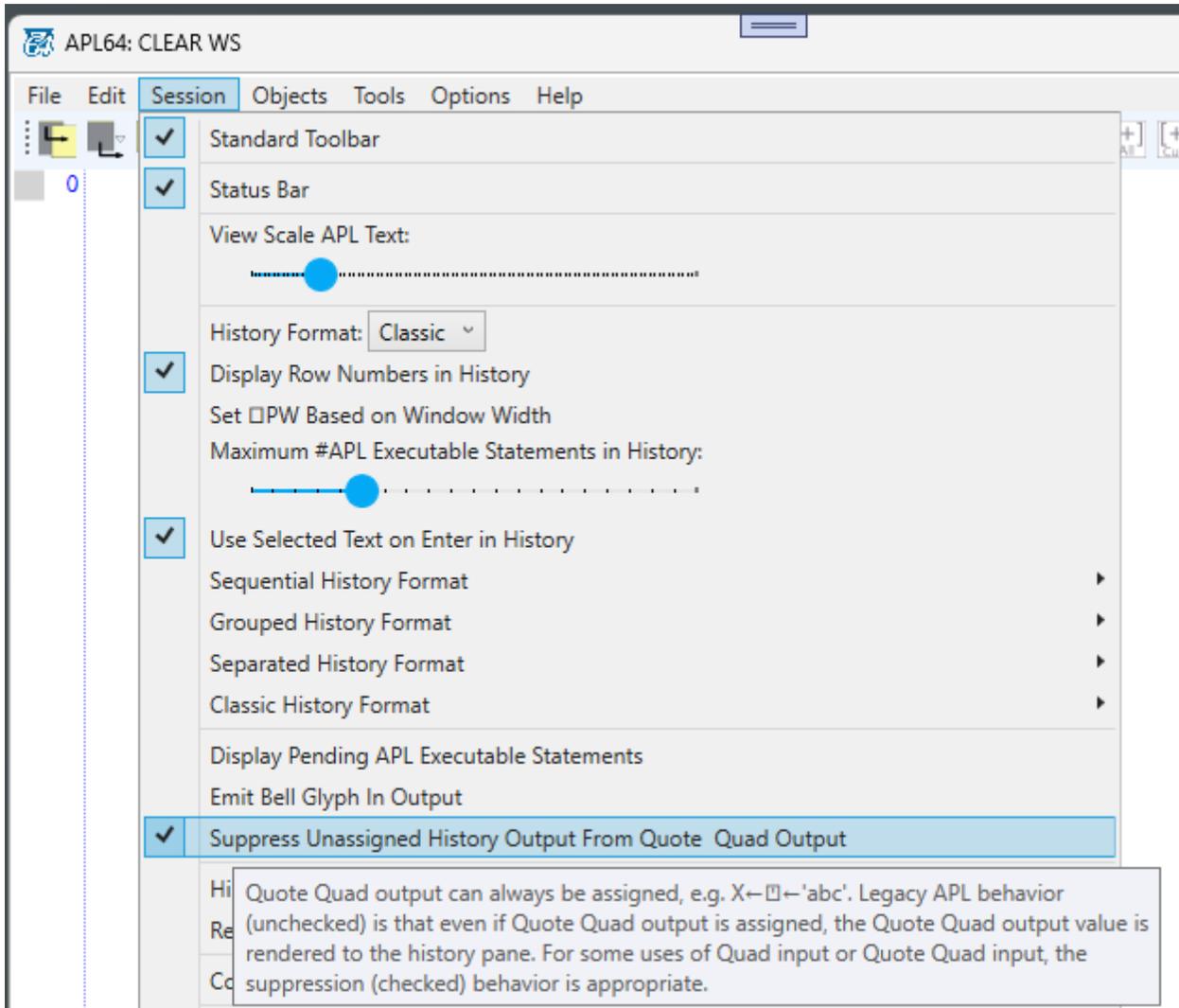
## □QQO System Variable

The APL64 □QQO system variable is a Boolean value indicating if Quote-Quad output will be rendered to the APL64 developer version history pane.

Quote-Quad output can always be assigned, e.g.  $X \leftarrow \square \leftarrow 'abc'$ .

The legacy APL behavior of Quote-Quad output is to render the text to the history pane, even if Quote-Quad output is assigned to an APL variable.

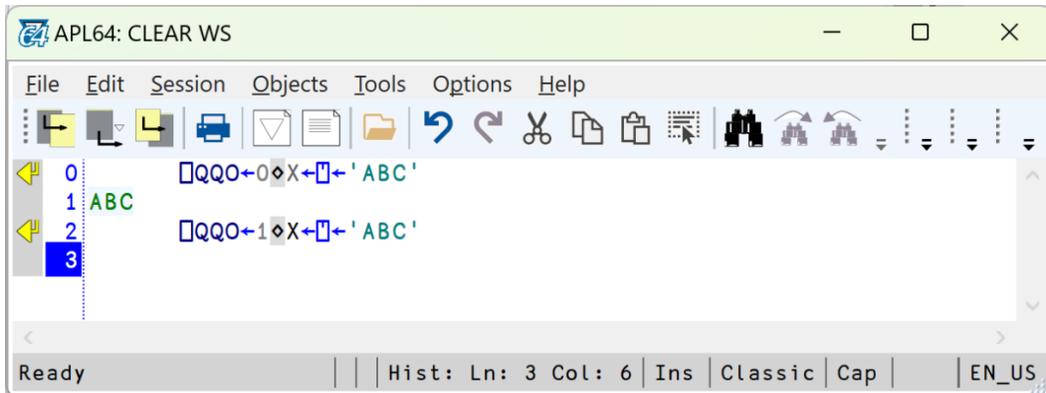
The legacy behavior of Quote-Quad output may be overridden by the APL64 programmer using the APL64  QO system variable or the Session | **Suppress the Unassigned History Output from Quote-Quad Output** menu option.



```

 QO←0∘X←⊖←'ABC'
 QO←1∘X←⊖←'ABC'

```

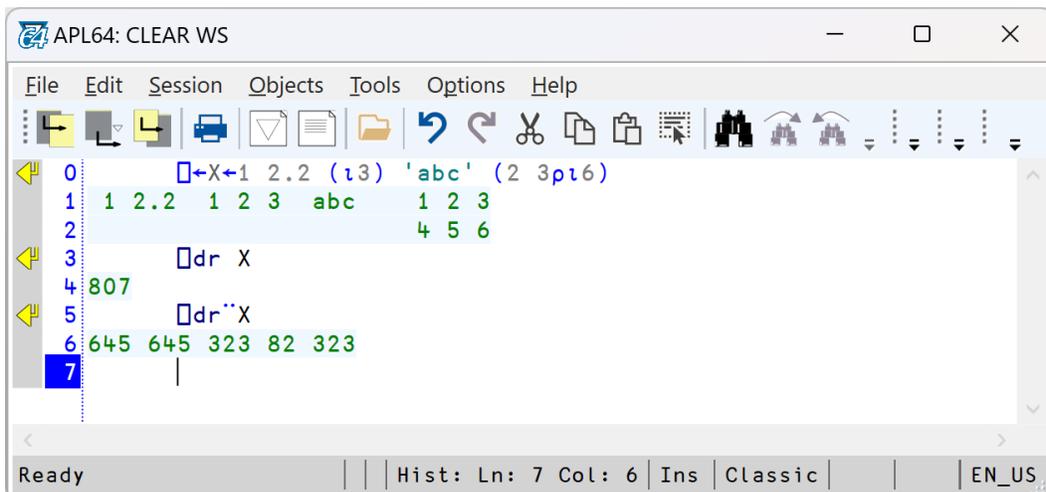


This option is useful if Quad or Quote-Quad input is incorporated into an APL64 programmer-developed utility function or an APL idiom. See the [enhanced Quote-Quad input](#) and [enhanced Quad input](#) examples.

## Quad Output: □←

Quad output may be assigned to an APL variable.

Quad output renders the interpreter-formatted Quad output value to the APL64 Developer version history pane.



## □QQDefault

### Default User Response to Quad or Quote-Quad Input

The right argument of □QQDefault is used to set or modify the value of an internal APL64 text variable ('buffer'). The value of this 'buffer', up to the first □tcnl, or the entire 'buffer' value if it does not contain □tcnl, is the default response to the next Quad or Quote-Quad query. The remaining value of the 'buffer', if any, is retained for subsequent Quad or Quote-Quad queries.

QQDefault renders no output to the APL64 developer version history pane when a left argument of  $\bar{1}$ , 0 or 1 is used.

QQDefault is available only in the APL64 developer version. The value of the 'buffer' does not persist when the current APL64 developer version instance ends.

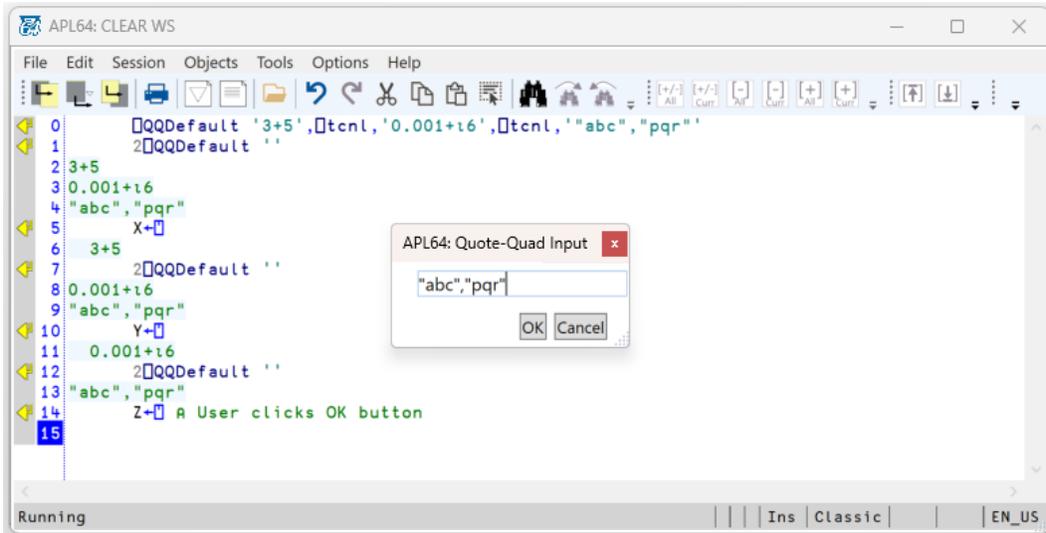
<input type="checkbox"/> QQDefault Left Argument	Action on Internal 'buffer' Variable
1	Append right argument to 'buffer'
0	Replace 'buffer' with right argument
$\bar{1}$	Prepend right argument to 'buffer'
2	Return the current value of 'buffer' (Right argument, e.g. ", ignored)

```

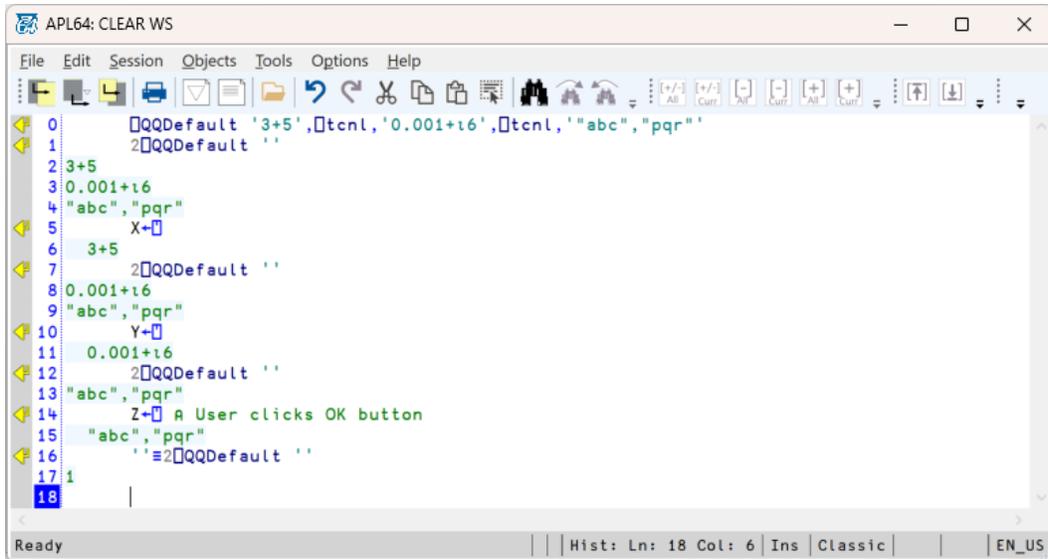
 QQDefault '3+5', tcnl,'0.001+t6', tcnl,"abc","pqr"
2 QQDefault ''
X←
2 QQDefault ''
Y←
2 QQDefault ''
Z← @ User clicks OK button
"≡2 QQDefault ''

```

Before user closes the Quote-Quad dialog:



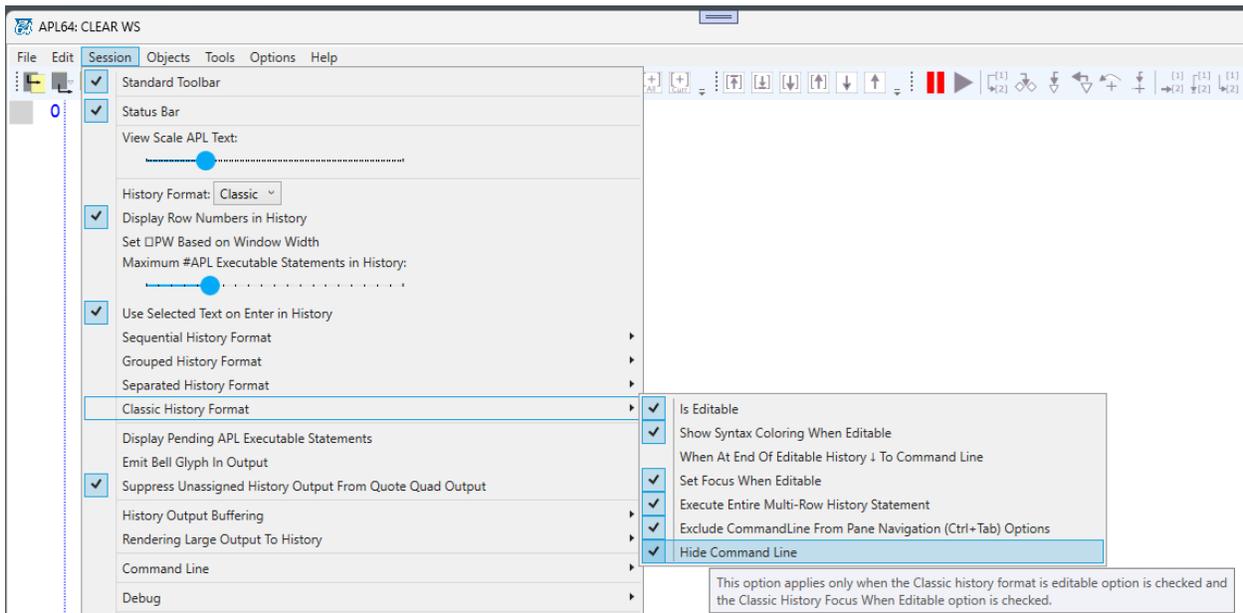
After the user closes the Quote-Quad dialog:



## Option to Suppress Command Line

Initial versions of the APL64 developer version Quad and Quote-Quad input were dependent on the Command Line in the APL64 Developer version. This dependency has been eliminated, so that the APL64 programmer may hide the Command Line when the editable Classic history format is used. The option to hide the Command Line does not apply to the Sequential, Grouped, Separated or Non-editable Classic history formats.

Appropriate settings to hide the Command Line when the classic history pane format is selected:



## □ Pr – Deprecated

□ Pr is an APL-legacy system variable that is deprecated in APL64. In APL64 the result of Quote-Quad input never includes the programmer-defined prompt text.

## □ Arbout – Deprecated

□ Arbout is an APL-legacy system function that is deprecated in APL64. In APL64 the result of Quote-Quad query never includes the programmer-defined prompt text for that query.

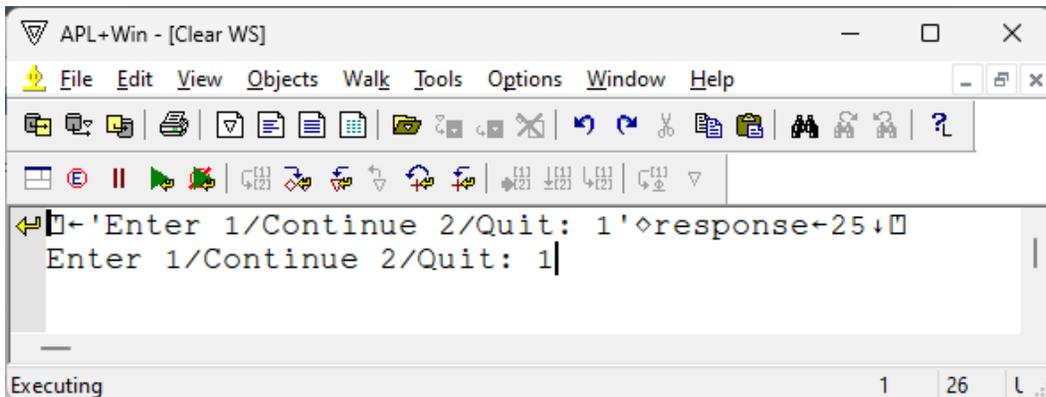
## □ Inbuf for Execution of APL Statements

In APL64 □ Inbuf is used to execute APL statements whenever the interpreter idle, i.e. in the ready or suspended state. Refer to the documentation of □ Inbuf for more information.

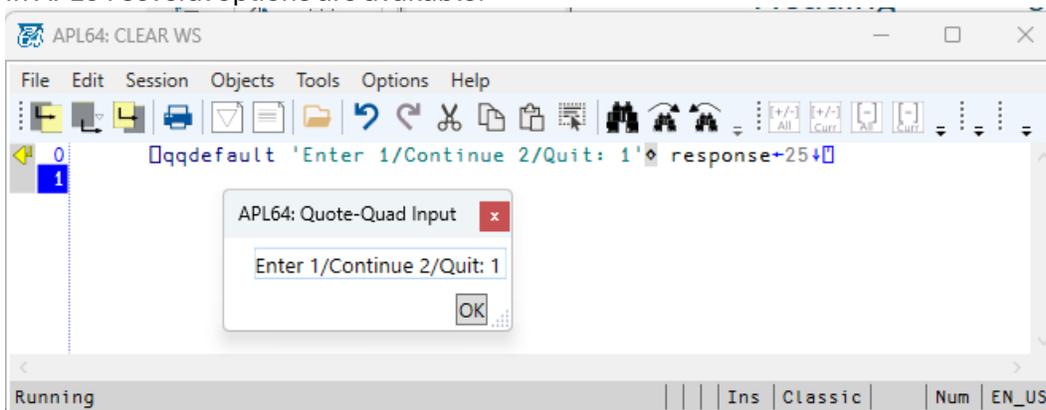
## APL+Win Compatibility: Quad Input & Quote-Quad Input

In APL64 use Quote-quad output to set the prompt for quad input or quote-quad input and use □ QQdefault to set the default response for quad input or quote-quad input.

In APL+Win:



In APL64 several options are available:



Or:

