



The New Code Editor

Fully-Functional Code Editor Control for Win32
Platforms

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Brief Description of the Code Editor

The Code Editor is an ActiveX control that can be used to replace the standard source code editor (based on an SAP TextEditor) for any SAP system that supports ActiveX embedding. The reason for the replacement is that the standard RTF control, which the SAP TextEditor is based on, is not optimized for working with line-based text (as source code) and does not support modern code-editing functionality.

Code Editor Control is a line-based editor, specially developed for working with dynamically defined text blocks that ensure good performance during code highlighting. The editing functionality is optimized for programmers' needs, and is fully adjustable because it is independent of standard components.

The Code Editor interface is optimized to work with the SAP GUI for Windows release 6.40 (Patch 10) and higher, which support SAP Enjoy Controls technology and Basis release 7.0 (SAP_BASIS component 700). The Code Editor is fully integrated into the NW AS 7.0 ABAP environment by a specially-designed ABAP wrapper and supports all the functionality available in the current editor. It is designed to replace the standard TextEditor in such transactions where the current code editor is used (ABAP Workbench - SE80, Function Builder - SE37, Report Builder - SE38, Class Builder - SE24, etc.) by replacing calls of the SAP TextEditor with calls of the Code Editor Control.

The Code Editor provides the following advantages for ABAP programmers:

- Enhanced speed of development
- Improved code quality
- Easier understanding of program source

All of those elements result in a reduction of resources spent by the company on application development.

Main Features of the New Editor

Use of the Code Editor provides the ABAP programmer with a fully functional environment, or Integrated Development Environment (IDE), for developing. It supports all the modern technologies of programming, such as functionality for powerful language syntax highlighting, outlining language structures, real-time code hints, and auto-completion of language structures and elements.

The Code Editor supports the easy adjustment of programming language syntax through XML configuration files, and the creation of new language schemes, which enables dynamic plugging of other languages (in addition to ABAP) without programming. By default, the editor has language schemes for support of ABAP, HTML, and C++ code.

The Code control includes a functional shell for creating and executing user-defined source templates, providing editor variables and interactive elements that speed up development, which reduces the amount of "routine coding."

The new editor supports extensive formatting functions and increases interactivity of programming in real time, greatly expanding the functions provided by the standard SAP ABAP editor (Pretty Print); for example: automatic code indentation, smart tabs, automatic brackets, automatic case and mistyping correction. All these actions are executed in real time, without the necessity of data transfer on backend.

Code Editor supports color printing with print preview, corresponding WYSIWING standards that facilitate better documentation creation, and the understanding of complex programs listings.

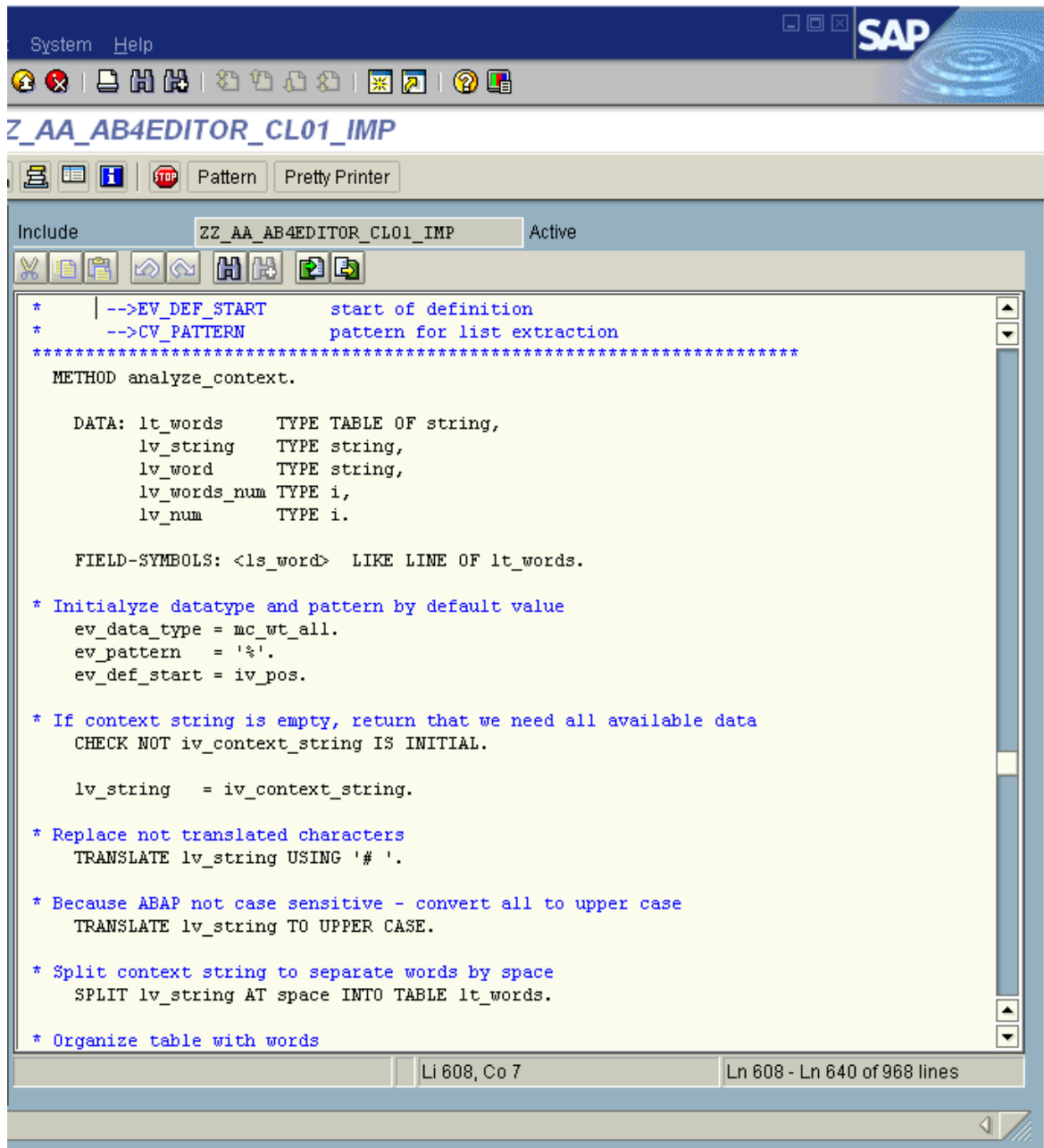


Figure 1: Current Editor for ABAP

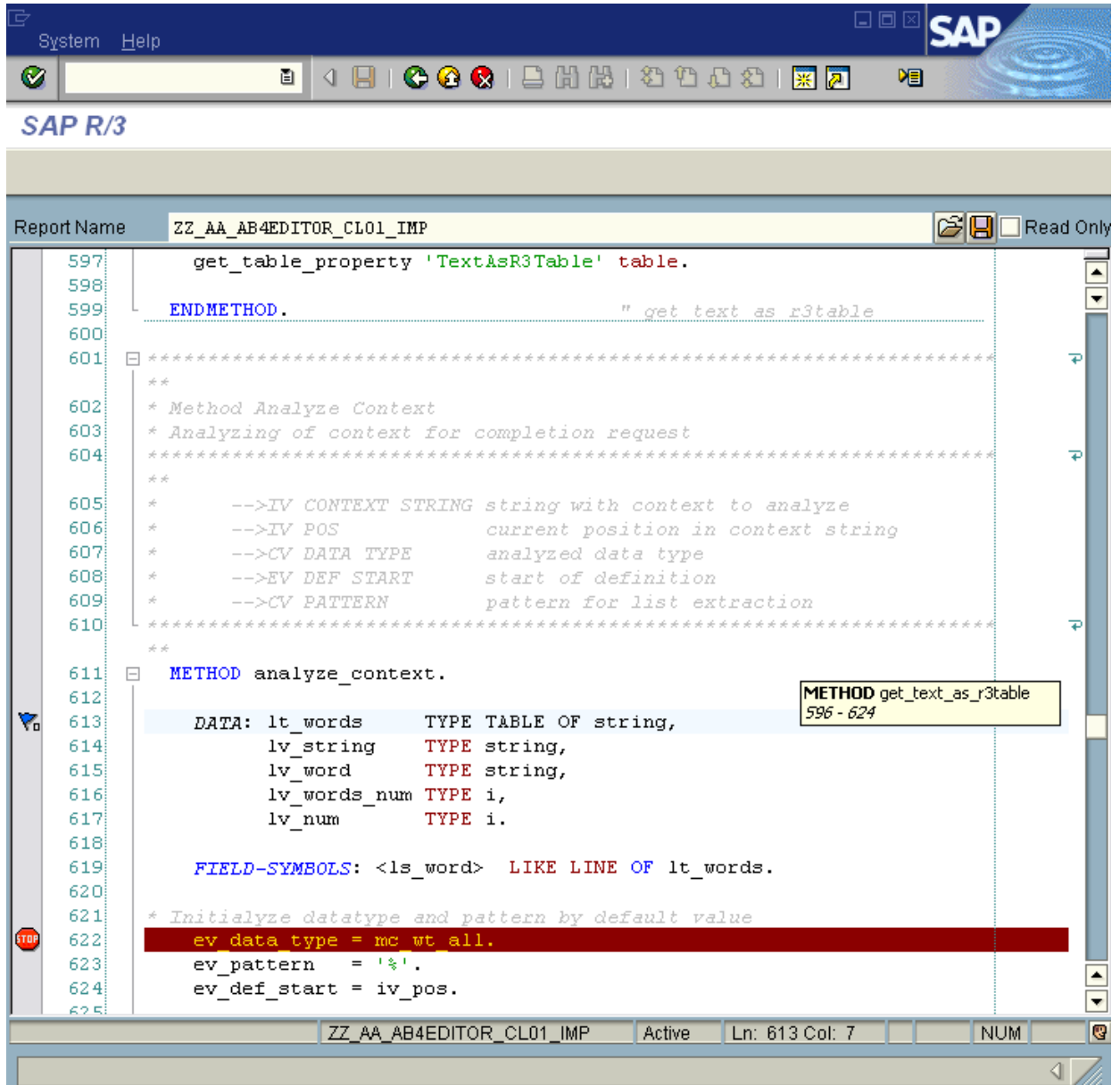




Figure 2: Code Editor Integrated in the NW AS 7.0 ABAP Environment

Features Matrix

Description of symbols used for feature indicating:

-  - Does not exist
-  - Exists
- \pm - Partially exists

Feature Name	SAP ABAP Editor	Code Editor
Customizable syntax highlighting	\pm	
Support of programming languages		
Display Functionality		
Changed lines indicator		
Line numbers		
Protected areas		
Current line highlighting		
Page width indicator		
Structure separators		
White space		
Different types of word wrap	\pm	
Different cursor and caret styles		
Active status bar	\pm	
Edit Functionality		
Comment/uncomment lines		
Indent/un-indent lines		
Case changing (upper/lower/capitalize/invert)		
Sort lines		
Join lines		
Insert date/time in different formats		
Copy append/cut append to clipboard		
Drag and Drop editing		
Clipboard ring		
Plain text, RTF, and HTML clipboard format	\pm	
Block selection of text		
Pretty Print		
Auto brackets		
Auto indent		
Smart tabs		
Surround selection		
Double rate on key repeat		

Feature Name	SAP ABAP Editor	Code Editor
Runtime case correction	✗	✓
Customizable tabs	±	✓
Optimal fill	✗	✓
Caps lock correction	✗	✓
Auto correction of mistyping	✗	✓
Full text formatting	±	✓
Automatic brace and structures matching	✗	✓
Power Find/Replace Functionality		
Memory combo boxes with last typed items	✗	✓
Mark All function	✗	✓
Search with regular expressions	✗	✓
Incremental search	✗	✓
Code Outlining/Structuring		
Open/close code structures	✗	✓
Collapse comments	✗	✓
Format Tags outlining	✗	✓
Code hints	✗	✓
Quick Info and Hovering Tool tips	✗	✓
Current Scope display	✗	✓
Code templates	±	✓
Bookmarks	✗	✓
Breakpoints	±	✓
Scroll Navigation	✗	✓
Print Functionality		
Color WYSIWYG printing	✗	✓
Print Preview	✗	✓
Adjustable footer/header	±	✓
Line numbers	✗	✓
Lines wrap	±	✓
Window Splitter	✗	✓
Go to line	±	✓
Different keyboard schemes	✗	✓
Export Functionality		
Export with syntax highlight to HTML	✗	✓
Export with syntax highlight to RTF	✗	✓
Export with syntax highlight to PDF	✗	✓
External Files Handling		
Open/Save/Save As of external files	✓	✓
Save/Restore of breakpoints and bookmarks for files	✗	✓
Tracing external changes of opened files, and reloading if necessary	✗	✓

Feature Name	SAP ABAP Editor	Code Editor
Automatic language determination	✘	✓
Automatic DOS/UNIX/MAC format determination	✘	✓
Unlimited file size	✓	✓
Auto Save document function	±	✓
Trim Trailing spaces on save	✓	✓
Leave Undo after Save	±	✓

Description of Functionality

1 Powerful, Fully-Customizable Highlighting for Predefined Keywords, Comments, and Strings

Adjustable highlighting colors provide the ability to adopt color schemes for any requirements. Keyword sets can also be displayed in bold, italic, or underline styles. Font faces and sizes are also completely customizable.

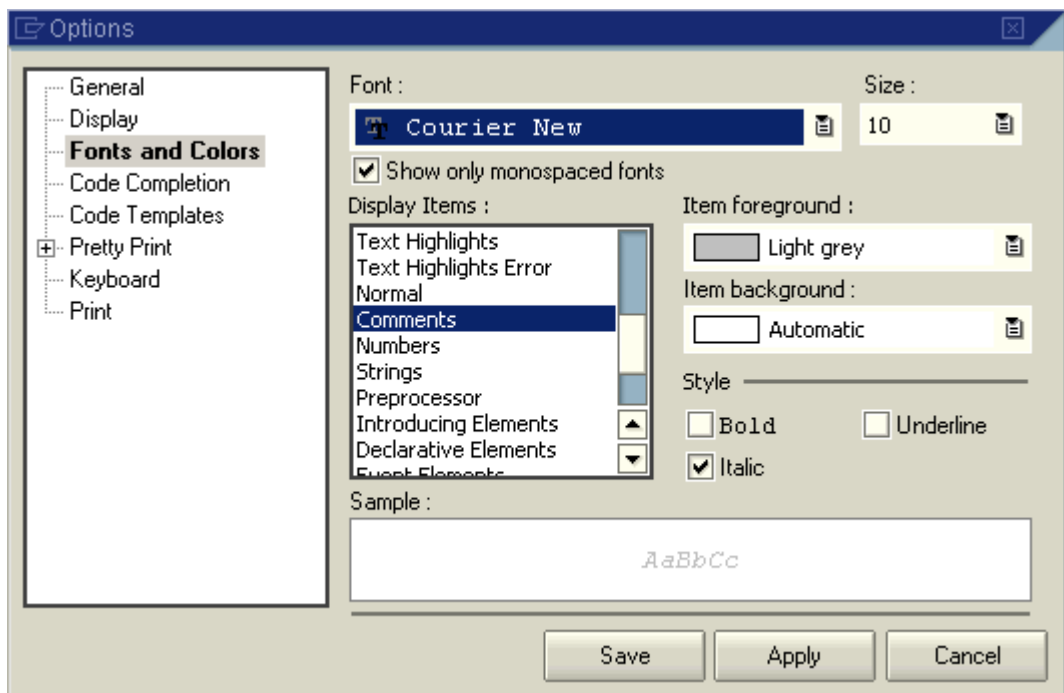


Figure 3: User settings for Code Editor. Customizing of color schemes

2 Language Schemes

Customizable programming language schemes allow the possibility of working with any programming language that has a maintained schema; support by default of ABAP, HTML, and C++ languages. This makes it possible to work in the same environment with ABAP, BSP, and Java, for example.

3 Fully-Customizable Display Functionality

The Editor supports various display settings:

- a. The changed lines indicator shows you which parts of code you have changed during the last session and which changed parts were saved. Simplifies the changing of code known to be faulty or someone else's code.

- b. Line numbers help to navigate through coding and is useful in word wrap mode to mark wrapped lines.
- c. Protected areas used for defining part of the document as, for example, read-only; displays it using a read-only color and an additional symbol in the changed lines margin.
- d. Current line highlighting makes it easy to find current cursor position in the document.
- e. White space shows you hidden symbols such as spaces, tabs, and line breaks.
- f. You can hide or display indicators, changed lines, numbers, and outlining margins depending on the amount of horizontal space needed.
- g. Vertical and horizontal scrollbars can be hidden or displayed.
- h. You can use page width to check the length of your lines and see if they are inside of a defined range.
- i. Structure separators show you where high-level structures finish (function, subroutine, class, method, etc), separating them from one another and facilitating navigation.

```

10  □ FORM show_loc_master USING iv_locno TYPE /sapapo/locno
11                                is_prodev TYPE ts_prodev.
12  □  "$ Region Data declaration
13  DATA: ls_loc                 TYPE ts_loc,
14          lt_changes            TYPE TABLE OF /sapapo/sloc_changes,
15          lt_pegid             TYPE /sapapo/pegid_tab.
16  □  "$ Endregion
17
18  FIELD-SYMBOLS: <ls_prodev> TYPE ts_prodev.      "#EC
19
20  REFRESH lt_changes.
21
22  □  IF iv_locno EQ is_prodev-locno.
23      ls_loc-locid = is_prodev-locid.
24  ELSE.
25      READ TABLE gv_buffer-loc INTO ls_loc WITH KEY locno = iv_locno.
26  ENDIF.
27  ▶  ASSIGNING
28  □  LOOP AT gv_buffer-loc ASS| .
29  ENDLOOP.
30  ▶
31  □  IF sy-subrc = 0.
32      *--> Absprung in Lokations-Stammdaten
33      CALL FUNCTION '/SAPAPO
34          /LOC_MAINTENANCE'
35      EXPORTING
36          iv_locid   = ls_loc-locid
37          iv_action  = 'S'           " S=Show, E=Edit, C=Create

```

Figure 4: Visualization Possibilities in Code Editor

4 Different Types of Word Wrap

Customizable word wrap helps working with lines that are longer than the screen width or defined page width. There are several word wrap modes available:

- By column number

- By window edge
- By column number inserting hard break

```

163
164 | *-----*
165 | *          CLASS lcl_ab4editor IMPLEMENTATION
166 | *-----*
167 | CLASS lcl_ab4editor IMPLEMENTATION.
168 |
169 | *****
170 | **|
171 | * Method Constructor
172 | *****

```

Figure 5: Word Wrap by Column Number Enabled in Code Editor

5 Different Cursor and Caret Styles

The Editor provides different cursor and caret styles for overwrite, insert modes, interactive search, and block selection that makes it easy to indicate different modes of operation/execution.

6 Active Status Bar

Active status bar: Panels indicate status of Caps Lock, Num Lock, and Overwrite modes. These modes can be changed by double-clicking on them. Double-clicking on the position panel will call the "Go to Line" dialog. Double-clicking on the panel with document name will copy it to clipboard.

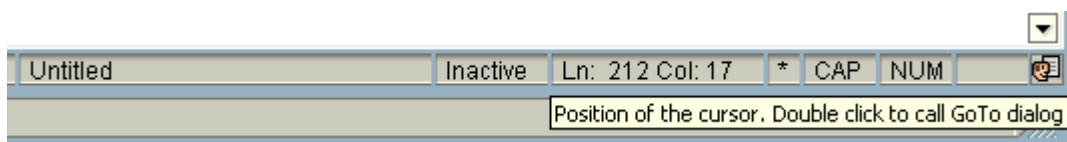


Figure 6: Editor Status Bar with Indicators, Active Panels, and User Settings Button

7 Edit Functionality

Edit functionality supports functions including:

- Comment/uncomment lines
- Indent/un-indent lines
- Case-changing (upper/lower/capitalize/invert)
- Sort lines
- Join lines
- Format selection by schema (as in SAP Pretty Print)
- Insert date/time in different formats
- Copy append/cut append to clipboard.

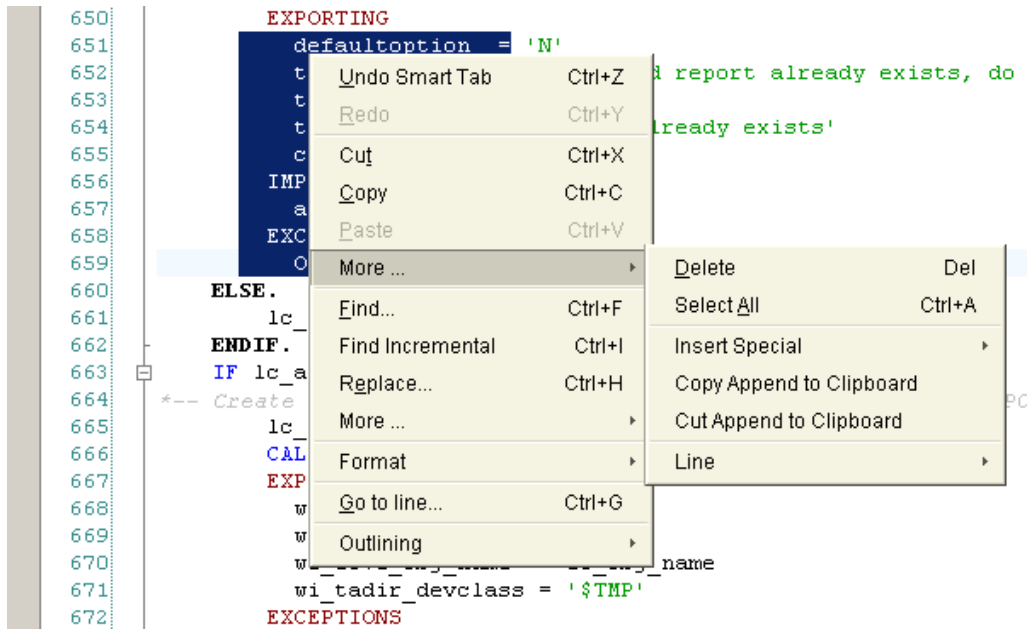


Figure 7: Context Menu for Edit of Selection

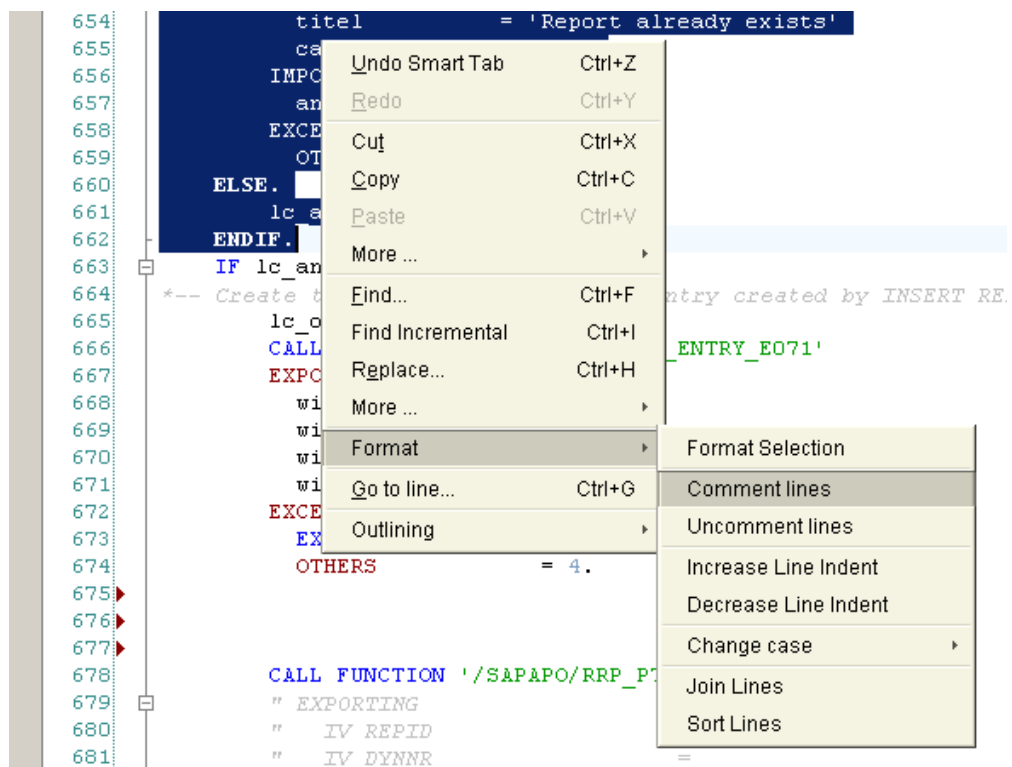


Figure 8 : Context Menu for Text Formatting

8 Drag & Drop Editing

The Editor supports Drag & Drop editing, providing another way for intuitive copying and pasting.

9 Clipboard Ring

When text is cut or copied, the fragments are stored in an editor clipboard known as the "Clipboard Ring," where you can pick and choose among them and paste back into your code. The clipboard contains up to 12 items, presented in historical sequence and moved with LIFO logic. This is a powerful feature for quickly copying several pieces of text to a new location or for recalling text that you inadvertently cut. The clipboard ring can remember block and normal items.

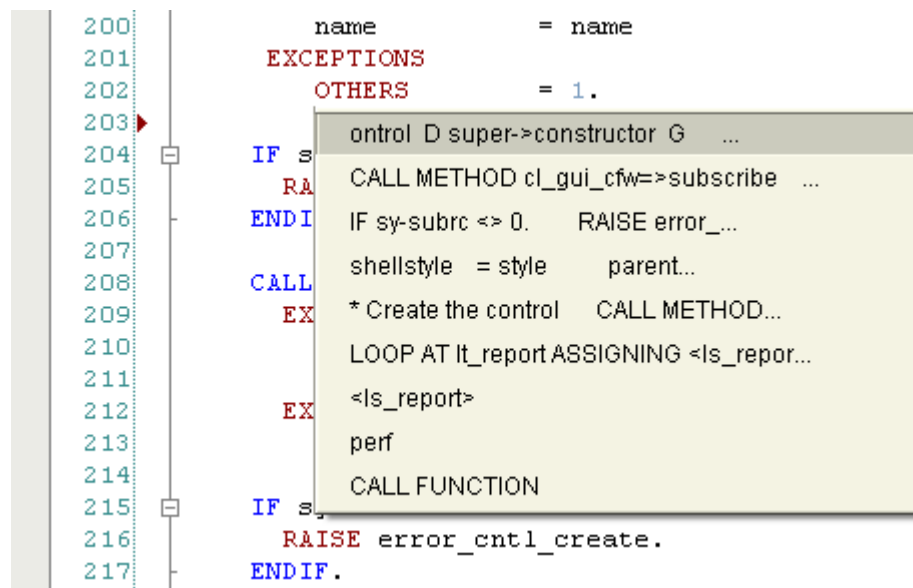


Figure 9: Extended Paste Menu Shows List of Text Items in Clipboard Ring

10 Block Selection of Text in Addition to Normal Selection

The block selection is supported by most of the common actions, which are executed with normal selection (copy, paste, indent, etc.).

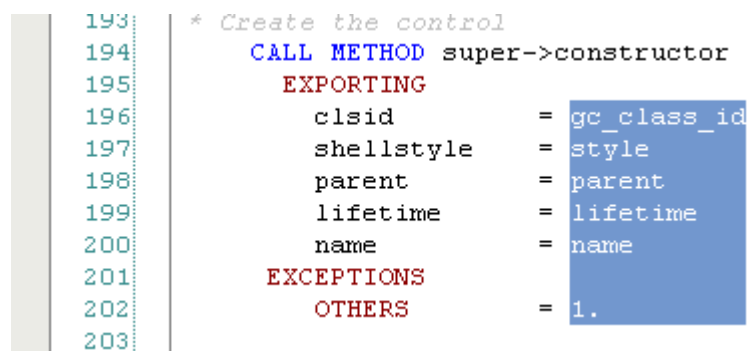


Figure 10: Block Selection of Text

11 Multiple Clipboard Formats

Support of multiple clipboard formats, such as Text, RTF, and HTML provides the possibility of WYSWING pasting text in Microsoft Word or Microsoft Outlook, for example. The Unicode text format is supported, allowing the copying and pasting of Unicode characters.

12 Extended "Pretty Print" Functionality

List of available runtime functions:

- a. "Auto Brackets" automatically adds closed bracket on typed open bracket.
- b. "Auto Indent" function recognizes language structures and applies runtime formatting of the code.
- c. "Smart Tabs" optimize tab function in beginning of the lines.
- d. "Surround Selection" helps insert surrounding brackets for selections.
- e. "Double rate for key repeat" function speeds up navigation command execution on repeating.
- f. "Format after every Paste" formats inserted text according to current indentation, avoiding manually doing so.
- g. Runtime Case Correction for predefined keywords (Uppercase, Lowercase, Capitalize, and Like In Dictionary)
- h. Customizable tab/space settings provide the option of choosing tab size and selecting that which you prefer.
- i. Optimal fill watches for optimal use of tabs and spaces in space offsets.
- j. Caps Lock Correction determines accidental usage of CAPS LOCK key and makes corrections.
- k. "Auto Correction" function helps determine errors due to mistyping and corrects them (as in MS Word).

13 Automatic Brace and Structures Matching, Current Scope Displaying

Automatic brace matching gives you immediate feedback on misplaced brackets or open-ended code segments. Automatic brace matching recognizes all brackets types, quotes, and structures defined in language specification. When you type a closing bracket, both it and its matching bracket remain highlighted until you type another key or move the cursor (same works for open/close structures). This makes visually identifying code blocks much easier. In addition, this may help identify mismatched or missing brackets and structures. Double-clicking on open/close structure tag will navigate you to the matching close/open tag in the document.

The Current Scope feature enables you to see current parentheses and hierarchy scope when you navigate through the code, highlighting active bracket pairs and structures. The current scope feature also enables error highlighting (in red color) of mismatched brackets.


```

586 LOOP AT ftab_program_file.
587     lc_program_file = ftab_program_file.
588     CASE lc_program_file(9.
589     WHEN mc_trdir_identifier.
590         lc_datatype = mc_trdir_short.
591     WHEN mc_report_identifier.
592         lc_datatype = mc_report_short.
593     WHEN mc_text_identifier.
594         lc_datatype = mc_text_short.
595     WHEN mc_doc_identifier.
596         lc_datatype = mc_doc_short.
597     WHEN mc_thead_identifier.
598         lc_datatype = mc_thead_short.
599     WHEN OTHERS. " Actual contents of repor
600         CASE lc_datatype.
601         WHEN mc_trdir_short.

```

Figure 11: Runtime Highlighting of Matched Structures when Typing

14 Powerful Find/Replace Functionality

In addition to common features used in find/replace dialog extended functionality added:

- Memory combo boxes with last typed items;
- Mark All function. Marking all occurrences of search text in document with bookmarks;
- Search with regular expressions.

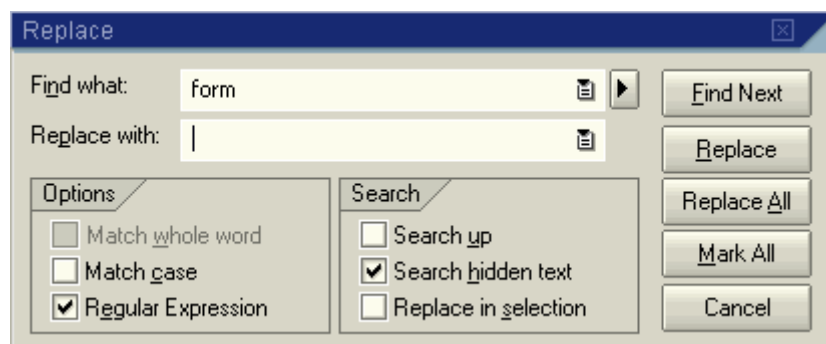


Figure 12: Extended Find/Replace Dialog

15 Incremental Search (Forward/Backward)

Runtime forward/backward search through document – when typing text, editor searches and selects for first occurrence of the search string on a letter-by-letter basis as you type characters.

16 Code Outlining/Structuring

The document text is analyzed at runtime using data predefined in language specifications and updated with each document change. Code outlining gives you a better document overview and the possibility of finding errors, such as unclosed structures, without checking or compiling. This is similar to the compression view of code in the old ABAP editor, where you could see collapsed if-endif blocks of code, to quickly determine if nested constructions were properly defined.

- View code in hierarchy;
- Collapse/expand of blocks;
- Collapse to definition;
- Multi-line comments outlining;
- Newly-defined format tags for comments found in the middle of statements help create a structure in any part of the code.

```

10  ▢ FORM show_loc_master USING iv_locno  TYPE /sapa
11                               is_pro dov TYPE ts_pr
12  ▢ # $ Region Data declaration
17  DATA: ls_loc      TYPE ts_loc,
18         lt_changes  TYPE TABLE OF /sapapo/sloc_changes,pro dov.
19         lt_pegid   TYPE /sapapo/pegid_tab.
20  "$ Endregion
21
22  ▢ IF iv_locno EQ is_pro dov-locno.
23     ls_loc-locid = is_pro dov-locid.
24  ELSE.
25     READ TABLE gv_buffer-loc INTO ls_loc WITH K
26  ENDIF.

```

Figure 13: Code Outlining and Tool tip for Collapsed Area when Hovering

17 Code Hints

Code hints will help in runtime during typing, suggesting ways to examine auto correction dictionaries, user templates etc. By pressing Tab or Enter, when Code Hint is shown, you can insert it into your code without typing the rest of the characters. The hint color shows how relevant a suggestion is.

```

335  lv_rep_name  TYPE char40.
336  ▢ Loop ($)
337  loop
338
339  ▢ IF NOT report name IS INITIAL.

```

Figure 14: Code Hints: Editor Suggests Suitable Template

18 Quick Info

Quick Info functions for any part of code. The external application receives a request for an information string and provides text for tool tip display. The tool tip recognizes bold and italic tags and can display multi-lines information.

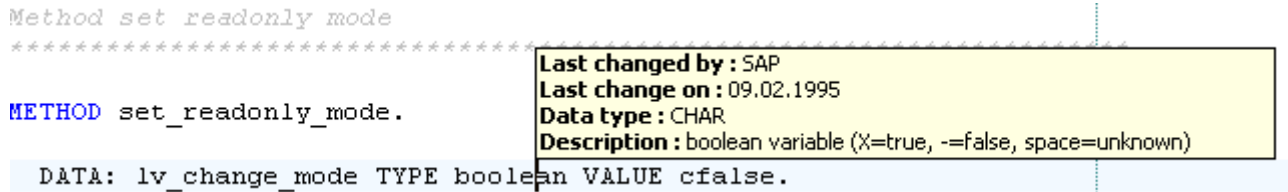


Figure 15: Quick Info for Data Type Called by Shift-Ctrl-Space in Text

19 User-Defined Code Templates

Powerful, user-defined templates with "Auto Expand" functionality greatly simplify typing of standard constructions. Supports such predefined tags as current date/time, clipboard content, and interactive selection.

20 Bookmarks

Support of named and unnamed bookmarks (as in MSVS) helps in navigation and code editing.

21 Scroll navigation

Scroll navigation provides you information about current position in code in a scroll tip, displaying current function, subroutine, class, method, etc. It also displays range of lines, which you currently scroll.



Figure 16: Scroll Tip Shows Current Position in Document

22 Printing with Previewing of documents in color

WYSIWING printing style provides more readable hard copies of documents. Printing supports user-defined footer and header text with predefined tags and different styles.

```

77     TYPES:
78         my string(256) TYPE c .
79
80     CONSTANTS:
81         mimesubtype     TYPE my string VALUE 'X-R3ABAP',
82         mimetype        TYPE my string VALUE 'APPLICATION'.
83
84     DATA:
85         m dp handle     TYPE cntl handle.
86
87     METHODS:
88

```

Figure 17: WYSIWYG Print Preview for Document Inside SAP NW AS 7.0 ABAP Environment

23 Window Splitter

Using of window splitter helps you in work with different parts of the document simultaneously.

```

20     METHODS:
21
22         constructor
23             IMPORTING
24                 value (name)     TYPE string
25                 value (style)   TYPE i
26                 parent         TYPE REF TO cl_gui_
27                 report name     LIKE sy-repid

```

```

172
173     METHOD constructor.
174
175     DATA: lt_events TYPE cntl_simple_events.
176
177     IF parent IS INITIAL.
178         RAISE error_cntl_create.
179     ENDIF.

```

Figure 18: Using Horizontal Splitting

24 Go to Line

Editor includes go-to line functionality with absolute and relative navigation.

25 Different Keyboard Schemes

User-defined keyboard schemes provide the ability to define different keyboard schemes and add preferred and multiple shortcuts for functions.

26 External Files Handling

External files handling includes:

- Automatic language determination
- Automatic DOS/UNIX/MAC format determination
- Tracing external changes of opened document, and reloading if necessary
- Saving/restoring document info (breakpoints and bookmark)
- Unlimited file size

27 Export Functionality

The editor supports WYSWING export functionality for most common text formats:

- Export to HTML

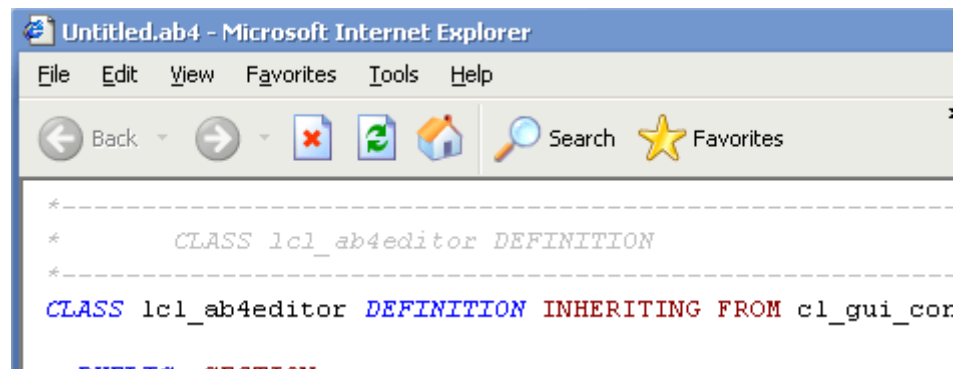


Figure 19: Internet Explorer Displays Document Exported to HTML

- Export to RTF

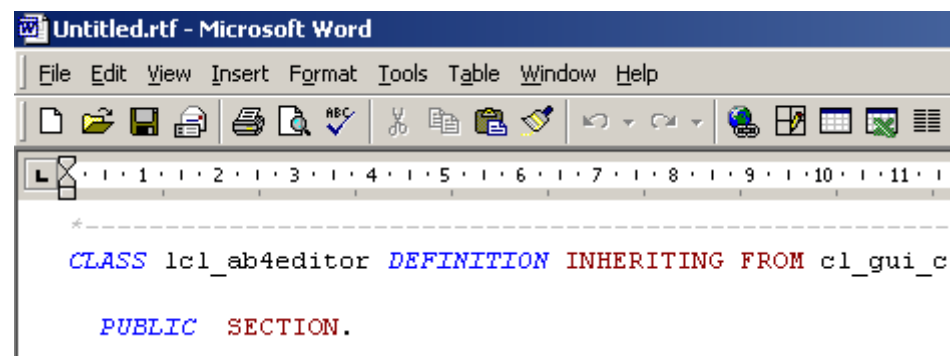


Figure 20: Microsoft Word Displays Document Exported to Rich Text Format (RTF)

- Export to PDF

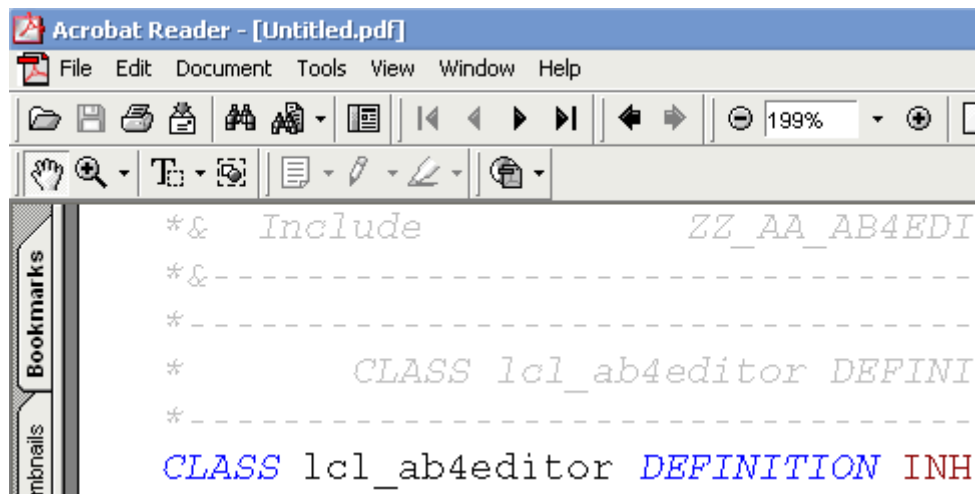


Figure 21: Acrobat Reader Displays Document Exported to PDF Format

28 XML Settings

All settings stored in XML format, easing export and import to other systems.

29 Other

Other functions provided by editor:

- a. Auto Save functionality for modified external documents and files
- b. Trim trailing spaces in lines on save
- c. Leave undo after save provides ability to undo changes even after saving