



CC AUDITOR

CC Reengineering

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Quality Auditing
for ABAP, C, C++, COBOL, Java, Natural, and PL/I

CC AUDITOR

Quality Auditing

for ABAP, C, C++, COBOL, Java, Natural, and PL/I

Description

CC AUDITOR is a quality assurance tool for the static quality analysis of ABAP, C/C++, COBOL, Java, Natural, and PL/I programs and entire application systems.

CC AUDITOR takes over the automatic testing of whether standard and company-specific quality guidelines are being met. **CC AUDITOR** also conducts quality analysis on the basis of company-specific definitions, allowing for the use of an unlimited range of quality characteristics to measure program quality. With constructive quality assurance features, **CC AUDITOR** allows developers, project leaders or auditors to test and evaluate programs according to the desired quality level.

Dialog Language: English

Areas of Application: Software Maintenance
Quality Assurance
Conversion
e-Commerce
Software Reengineering

Languages: ABAP
C
C++
COBOL
Java
Natural
PL/I

System Environments: Windows
IBM z/OS
Linux
Solaris

Once programs are developed and produced, they are very seldom developed further or even tested regarding quality after they are accepted. Even though quality standards and program guidelines are subject to constant change, preventive maintenance for quality improvement generally doesn't take place. There is simply not enough time for such time-consuming activities. As a direct result, program sources are difficult to read or understand, sometimes even directly after program acceptance. This often leads to poor quality and low productivity in maintenance. Universal programming standards generally don't exist, and often the time needed to realize such standards is simply not there.

The quality assurance tool **CC AUDITOR** is predestined to fill in this gap. It can be used for automated quality assurance in the following areas:

- Static analysis
 - ❖ Building of quality models
 - ❖ Assurance of standards fulfillment
- Complexity measurement for
 - ❖ Planning of maintenance and reengineering projects
 - ❖ Measurable criteria for the control / acceptance of third-party software
- Quality control
 - ❖ Quantification of defined quality characteristics
 - ❖ Change management / recognition of quality changes after production take-over
- Special issues, e.g.
 - ❖ Portfolio analysis
 - ❖ Identification of modules in need of reengineering

CC AUDITOR

Quality Auditing

for ABAP, C, C++, COBOL, Java, and PL/I

Functional Characteristics

The basis for quality assurance with **CC AUDITOR** is the high and flexible functionality of the program. The user can access a large number of provided or individually chosen metrics, so that company or user-specific quality standards can be automatically tested. Without being able to measure program content quality, it is impossible to achieve objective improvement, as for example after maintenance work.

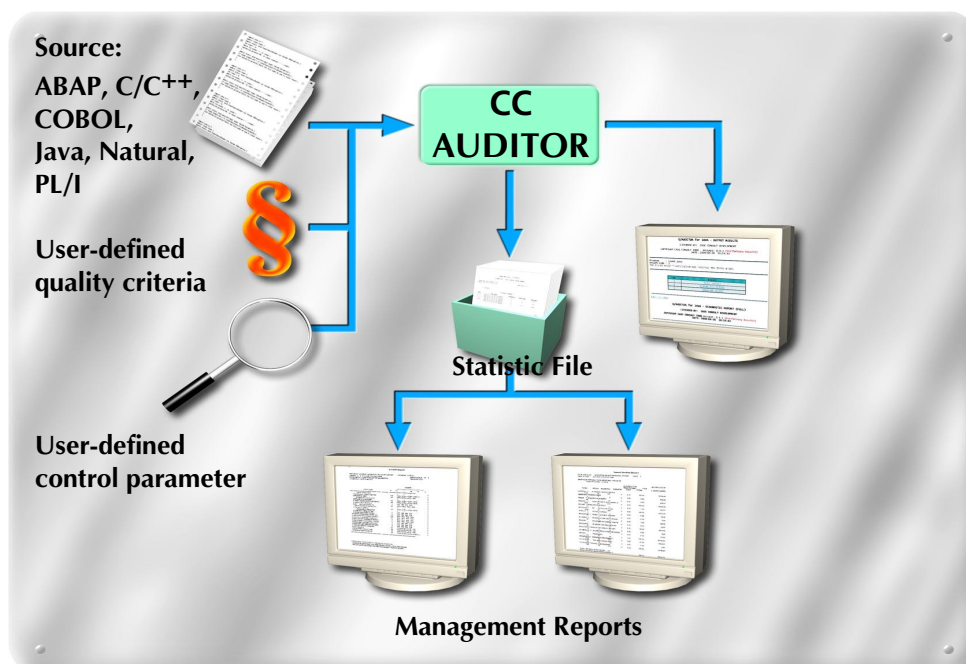
Central functional characteristics of **CC AUDITOR**:

- User can determine quality characteristics
- Choice of over
 - ❖ 200 standard metrics for ABAP
 - ❖ 60 standard metrics for C
 - ❖ 70 standard metrics for C++
 - ❖ 500 standard metrics for COBOL
 - ❖ 270 standard metrics for Java
 - ❖ 100 standard metrics for Natural
 - ❖ 300 standard metrics for PL/I
 - ❖ 360 user-specific metrics

- Portfolio analysis of entire program content
- Management reports
- Reduction of maintenance requirement through testing of program quality

Product Advantages

- Author-independent quality assurance
- Automation of measurement of software
- Quality control of developed or changed programs in every phase of product cycle
 - ❖ Constructive quality analysis
 - ❖ Analytical quality assurance
 - ❖ Documented and reliable quality statements
 - ❖ Production quality





Sample HTML-Reports under Windows

CC AUDITOR for ABAP - Output Results
 Licenced by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.0.1
 DATE: 2011-05-22 16:39:39

No	Report
1	AUDIT REPORT
2	DIAGNOSTIC REPORT
3	DIAGSUMM REPORT

CC AUDITOR for ABAP - Diagnostic Report
 Licenced by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.0.1
 DATE: 2011-05-22 16:39:39

Program : Z_FORMAT_SOURCE_CODE.abp
 Grade : S-2
 Grading : LOWEST

MetricId	Description	Count
1008	Variable Name Prefixed With Data Type	23
1009	Avoid Dash (-) in Variable or Field Name	1
1012	Use PARAMETERS instead of PARAMETER	0
1013	Avoid Hard-Coded Page in LINE COUNT	0
1014	Avoid Lowercase Function Module Names	0
1015	Avoid using EXIT inside Loops	0
1016	Avoid using CHECK in SELECT	0
1017	Avoid using CONTINUE in SELECT	0
1018	Avoid using OCCURS 0 Additions	9
1019	Use SORT instead of ORDER BY Additions	0
1020	Avoid using TYPE Additions in PARAMETERS	0

ANNOTATED SOURCE LISTING

```

00001
00002
00003 *-----
00004 * Please note:
00005 *Some lines have been deleted in this sample report!
...
...
00020 *-----
00021 REPORT z_format_source_code
00022
00023 TABLES:
00024     e071 , " Objects of a request or task (E070)
00025     tadir , "Catalog of R/3 Repository objects
00026     trdir ,      " System table TRDIR
00027     dd02t .      " R/3-DD: SAP Table Texts
00028

```

1018	Avoid using OCCURS 0 Additions	Next	Prev	Top
----------------------	---------------------------------------	----------------------	----------------------	---------------------

```
00029 DATA: BEGIN of mtab_old_prog OCCURS 0,
```

1008	Variable Name Prefixed With Data Type	Next	Prev	Top
----------------------	--	----------------------	----------------------	---------------------

```

00030     line (72) TYPE c,
00031     END OF mtab_old_prog.
00032

```

1018	Avoid using OCCURS 0 Additions	Next	Prev	Top
----------------------	---------------------------------------	----------------------	----------------------	---------------------

```
00033 DATA: BEGIN OF mtab_new_prog OCCURS 0
```

1008	Variable Name Prefixed With Data Type	Next	Prev	Top
----------------------	--	----------------------	----------------------	---------------------

1009	Avoid Dash (-) in Variable or Field Name	Next	Prev	Top
----------------------	---	----------------------	----------------------	---------------------

```

00034     line (72) TYPE c,
00035     END OF mtab_old_prog.
...
...
...

```



Sample HTML-Reports under Windows

CC AUDITOR for C - Output Results
 Licenced by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.6.0
 DATE: 2011-01-24 16:39:39

No	Report
1	AUDIT REPORT
2	DIAGNOSTIC REPORT
3	DIAGSUMM REPORT

CC AUDITOR for C - Diagnostic Report
 Licenced by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.6.0
 DATE: 2011-01-24 16:39:39

Program : Sample.c
 Grade : S-14
 Grading : LOWEST
 STDFILE : C:\cc_auditor1.6\datafiles\c\standard.dat

MetricId	Description	Count
1002	IF Formatting violation	5
1006	For Formatting violation	0
1010	While Formatting violation	3
1012	More than one statement per line	0
1013	Switch Statement without Default Clause	0
1029	Number of String Operating Functions	2
1038	#if-#elif-#else-#endif Formatting	1
1045	Nesting Level Exceeds Limit	0
1054	Lines of Code per block Exceeds Limit	3
1068	Source line exceeding column limit	3
1069	Variables to be commented	0
1094	Exit without exception handling	0
1098	Unbounded arrays not allowed	0
1100	No specified Header comments	1
1101	No Module:,Purpose: Header Comments	1
1102	No \$History: Header Comment	1
1104	Undeclared variables used	10



Sample HTML-Reports under Windows

ANNOTATED SOURCE LISTING

```

00001 /*=====
00002 /* Please note:
00003 /* Some lines have been deleted in this sample report!
00004 /* This is marked with ... in the code
00005 /*=====
00006 ...

```

1100	No specified Header comments	Next	Prev	Top
1101	No Module:,Purpose: Header Comments	Next	Prev	Top
1102	No \$History: Header Comment	Next	Prev	Top

```

00042 #define QA4M1023_DT      " 2003-03-05"
00043 #define QA4M1023_VER     "1.4.0"
00044
00045 #define QA4M1023_DT      " 2003-03-05"
00046 #define QA4M1023_VER     "1.4.0"
00047 /*=====
00048 /*
00049 #if _WIN32

```

1038	#if-#elif-#else-#endif Formatting	Next	Prev	Top
----------------------	-----------------------------------	----------------------	----------------------	---------------------

```

00050 #include <wtypes.h>
00051 #endif
00052 ...
00098 /*Forward declaration of internal functions */
00099
00100 void check_rekurs_call_23(stm_view stmt_23);
00101 /* Function to check if there is any recursive fn. calls */
00102 void get_funct_name_23(stm_view stmt_23);
00103 /* Function to get the current function name */

```

1068	Source line exceeding column limit	Next	Prev	Top
----------------------	------------------------------------	----------------------	----------------------	---------------------

```

00104 /*
00105 /*=====
00106 /* Function : qa4m1023(version_struct,stm_view,char *,summ_struct,metric_info);
00107 /*=====
00108 /* Purpose : The function passes statements,in which function call can be present,
00109 /*           to the fn. check_rekurs_call_23() for checking recursive fn. calls
00110 /*=====
00111 /*
00112

```

1054	Lines of Code per block Exceeds Limit	Next	Prev	Top
1068	Source line exceeding column limit	Next	Prev	Top

```

00113 long WIN_API qa4m1023(version_struct ver, stm_view stmt, char* mode, summ_struct summary,
metric_info metricinf)
00114 {
00115     version_struct version_023 = NULL; /* To store pointer to version struct */
00116     stm_type type_23 = none_stm; /* To store the stm type within a stm_view */
00117
00118     funct_name_23 = NULL;
00119     metric_count_23 = 0;
00120     ...
00121     ...
00122     ...

```



CC AUDITOR for COBOL Output Results
(C) CC GmbH 2011

Sample Source Code

```

000010 IDENTIFICATION DIVISION.
...
001740 WORKING-STORAGE SECTION.
001750 77 WS-TA-JUL-DATE          PIC 9(5)      VALUE ZERO.
001760 77 WS-DATE-DIFF          PIC S9(5)     VALUE ZERO.
...
002790 01 TRANS-IN.
002800 02 FILLER.
002810 03 TR-TA                  PIC X(6).
...
003660 05 INV-SSN4               PIC X(4).
003670 05 INV-SSN3               PIC X(3).
...
008330 PROCEDURE DIVISION.
...
008520 PERFORM WRITE-EXC THRU WRITE-EXC-EXIT.
...
008560 READ TABLES-FILE RECORD AT END GO TO T-OUT.
008570 IF TABID NOT = 'DT' GO TO T-IN.
...
008760 CALL 'DATCALC' USING RTNCD, DATE-CHECK-NUM, TA-JUL-DATE.
...
009460 IF TR-CONTROL GREATER THAN MA-CONTROL
009470 NEXT SENTENCE ELSE GO TO CHECK-FOR-LOW.

```

Balance Report

DATE: 2011-05-22 AUDITOR (R) QUALITY BALANCE SHEET PAGE 1
TIME: 15:22:01 (C) CC GmbH 2011

SELECTION CRITERIA: DATE SELECTED: 2011-05-22
TIME SELECTED: 23:59:59

PROGRAM GRADE =====	NUMBER OF PROGRAMS =====	PERCENTAGE OF PROGRAMS =====
OK	1	2.63%
I	5	13.16%
W	1	2.63%
E	1	2.63%
S	30	78.95%
=====	=====	=====
TOTAL	38	100.00%



COBOL Sample Reports under z/OS

Diagnostic Report

```
/*QA *****/
/*QA * DATE: 2011-05-22 AUDITOR (R) DIAGNOSTIC REPORT */
/*QA * TIME: 12:09:27 (C) CC GmbH 2011 */
/*QA *****/

...
000010 IDENTIFICATION DIVISION.
...
001740 WORKING-STORAGE SECTION.
001750 77 WS-TA-JUL-DATE PIC 9(5) VALUE ZERO.
/*QA * #007 77 IDENTIFIED. */
/*QA * #019 FND: WS-TA-JUL-DATE */
001760 77 WS-DATE-DIFF PIC S9(5) VALUE ZERO.
/*QA * #007 77 IDENTIFIED. */
/*QA * #019 FND: WS-DATE-DIFF */
...
002790 01 TRANS-IN.
002800 02 FILLER.
/*QA * #010 DATA LEVELS NOT MULTIPLE OF 5. */
002810 03 TR-TA PIC X(6).
/*QA * #010 DATA LEVELS NOT MULTIPLE OF 5. */
...
003660 05 INV-SSN4 PIC X(4).
/*QA * #006 PIC NOT WITHIN 4 OF COL 40 */
003670 05 INV-SSN3 PIC X(3).
/*QA * #006 PIC NOT WITHIN 4 OF COL 40 */
...
008330 PROCEDURE DIVISION.
...
008520 PERFORM WRITE-EXC THRU WRITE-EXC-EXIT.
/*QA * #002 PERFORM...THRU IDENTIFIED. */
...
008560 READ TABLES-FILE RECORD AT END GO TO T-OUT.
/*QA * #020 MISSING END- (01) */
008570 IF TABID NOT = 'DT' GO TO T-IN.
/*QA * #001 LITERAL IDENTIFIED */
/*QA * #004 VERB UNDER IF/ELSE NOT INDENTED 4 */
/*QA * #017 MCCABE ESSENTIAL COMPLEXITY */
/*QA * #018 INVALID GO TO (3) FOUND. */
/*QA * #020 MISSING END- (01) */
008760 CALL 'DATCALC' USING RTNCD, DATE-CHECK-NUM, TA-JUL-DATE.
...
009460 IF TR-CONTROL GREATER THAN MA-CONTROL
/*QA * #012 THE WORD GREATER WAS USED. */
009470 NEXT SENTENCE ELSE GO TO CHECK-FOR-LOW.
/*QA * #003 ELSE NOT ALIGNED WITH IF */
/*QA * #004 VERB UNDER IF/ELSE NOT INDENTED 4 */
/*QA * #017 MCCABE ESSENTIAL COMPLEXITY */
/*QA * #018 INVALID GO TO (3) FOUND. */
/*QA * #020 MISSING END- (01) */
...
```



COBOL Sample Reports under z/OS

AUDIT Report

```

PROGRAM: SAMPLE2      AUDITOR (R) AUDIT REPORT      2011-05-22  12:09:28
GRADE:   S      2      (C) CC GmbH 2011            IMPROVABLE:  W      4
LICENSED BY: CASE CONSULT DEVELOPMENT              VERSION 5.2.0
STANDARD: CASE CONSULT
  
```

STANDARD	#	GRADE				S
		OK	I	W	E	
=====						
VERB STATISTICS		I	I	I	I	I
1 # LITERALS IN PROCEDURE	135	000+++001+++005+++010+++				I
2 PERFORM THRU	16	000===010===020	050			I
FORMATING ANALYSIS		I	I	I	I	I
3 IF/ELSE NOT ALIGNED	14	000+++005+++010+++	N/A			I
4 VERB UNDER IF NOT INDENT 4	99	000+++005+++010+++	N/A			I
5 PARA'S NOT IN COL 8	0	000	005	010	N/A	I
6 PIC NOT CLOSE TO 40	20	000+++	N/A	N/A	N/A	I
DATA DIVISION ANALYSIS		I	I	I	I	I
7 TOTAL 77 LEVELS	29	000+++005+++010+++	N/A			I
STANDARDS ANALYSIS		I	I	I	I	I
8 ISAM FILE ITEM FOUND	0	000	000	000	000	I
9 BDAM FILE ITEM FOUND	0	000	000	000	000	I
10 # NON-STANDARD LEVEL #'S	212	N/A	N/A	N/A	N/A	I
11 NUMBER OF COMMAS FOUND	18	N/A	N/A	N/A	N/A	I
12 SIGN (>,<=)/WORD CONSIST.	8	N/A	N/A	N/A	N/A	I
13 ELSE NEXT SENTENCE FOUND	2	N/A	N/A	N/A	N/A	I
14 UNSIGNED PIC/SIGNED VALUE	0	000	000	000	000	I
15 NUMERIC VALUE/ALPHA PIC	0	000	000	000	000	I
16 PARAGRAPH PERIOD MISSING	0	000	000	000	000	I
17 McCabe essential complexity	61	010===050===100	200			I
18 Invalid goto 3	60	010===050===100	200			I
19 Date fields, Century breaks	20	005===010===020	050			I
20 Missing Scope-Terminator	92	000+++005+++010+++050+++				I
=====						

* THE TOTAL CASE CONSULT RE/VISION SOLUTION:
 AUDITOR MEASURES AND PRESERVES YOUR COBOL PROGRAMS
 WHILE ARTISAN IMPROVES PROGRAMMERS' PRODUCTIVITY.



COBOL Sample Reports under z/OS

Impact Analyse Report

DATE: 2011-07-22 AUDITOR IMPACT ANALYSIS REPORT PAGE: 1
 TIME: 12:21:40 (C) CC GmbH 2011

SELECTION CRITERIA: DATE SELECTED: 2011-07-22
 TIME SELECTED: 23:59:59

TOTAL	# PGMS	MAXIMUM	MINIMUM	MODIFICATION TIME (HH:MM) UNIT	TOTAL	MODIFICATION COST (100.00 DM/HR)
LITERALS *	# LITERALS IN PROCEDURE					
4710	36	485	0	0:10	785:00	78500.00
PERFTHRU	PERFORM THRU					
9	7	3	0	1:00	9:00	900.00
IFELSE *	IF/ELSE NOT ALIGNED					
40	7	32	0	0:10	6:40	666.67
IFINDENT *	VERB UNDER IF NOT INDENT 4					
8478	29	1771	0	0:05	706:30	70650.00
PARA08 *	PARA'S NOT IN COL 8					
17	2	12	0	0:05	1:25	141.67
PICCLOSE *	PIC NOT CLOSE TO 40					
1720	35	354	0	0:05	143:20	14333.33
TOTAL77 *	TOTAL 77 LEVELS					
7	7	1	0	0:05	0:35	58.33
WORDSYMB *	SIGN(>,<,=)/WORD CONSIST.					
0	0	0	0	0:05	0:00	0.00
ELSENEXT *	ELSE NEXT SENTENCE FOUND					
12	6	2	0	0:05	1:00	100.00
PICSIGN	UNSIGNED PIC/SIGNED VALUE					
1	1	1	0	0:10	0:10	16.67
NUMALPHA	NUMERIC VALUE/ALPHA PIC					
92	1	92	0	0:30	46:00	4600.00
PARAPERIOD *	PARAGRAPH PERIOD MISSING					
0	0	0	0	0:05	0:00	0.00
ACCEPTCON *	ACCEPT FROM CONSOLE FOUND					
6	6	1	0	0:05	0:30	50.00
INVGO3	Invalid goto 3					
225	21	36	0	2:00	450:00	45000.00
UNREFDATAC	Unreferenced data elements C					
1165	35	156	0	0:05	94:10	9416.67
CUSTOM703-	Date fields, Century breaks					
252	18	79	0	0:00	0:00	0.00
CUSTOM918-	* Missing Scope-Terminator					
885	23	217	0	0:10	147:30	14750.00
TOTAL NUMBER OF PROGRAMS: 38						
TOTAL FOR NON-IMPROVABLE METRICS:					599:20	59933.34
TOTAL FOR IMPROVABLE METRICS:					1792:30	179250.00
(METRICS MARKED WITH ASTERISK)						
GRAND TOTAL:					2391:50	239183.34



Sample HTML-Reports under Windows

CC AUDITOR für CPP - Output Results
Licenced by: CASE CONSULT DEVELOPMENT
(C) CC GmbH 2011 Release: 1.6
DATE: 2011-01-24 16:39:39

No	Report
1	AUDIT REPORT
2	DIAGNOSTIC REPORT
3	DIAGSUMM REPORT

CC AUDITOR für CPP - Diagnostic Report
Licenced by: CASE CONSULT DEVELOPMENT
(C) CC GmbH 2011 Release: 1.6
DATE: 2011-01-24 16:39:39

Program : importdata.cpp
Grade : S-20
Grading : LOWEST

MetricId	Description	Count
1024	Number of Global Variables	20
1029	Number of String Operating Functions	68
1030	Preprocessor Restrictions	1
1034	Mismatch in Functions Parameter Count	0
1035	Prohibited CPP Keywords	58
1036	Local variables not intialized	0
1037	More than one Exit point in a function	8
1038	#if-#elif-#else-#endif Formatting	0
1045	Nesting Level Exceeds Limit	0
1046	No Function arguments or return types	47
1047	Number of asm Keywords	0

ANNOTATED SOURCE LISTING				
00001	00002 *-----			
00003	* Please note:			
00004	*Some lines have been deleted in this sample report!			
00005	*-----			
00006				
1029	Number of String Operating Functions	Next	Prev	Top
02625	strcpy(szInBuf, "");			
02626	GetImportLine(pFile, szInBuf);			
1029	Number of String Operating Functions	Next	Prev	Top
02669	while (nOffset < (int)strlen(szInBuf) && j < nColumnCount) {			
1030	Preprocessor Restrictions	Next	Prev	Top
00465	#undef THIS_FILE			
1046	No Function arguments or return types	Next	Prev	Top
01216	BOOL CImportDataP1::OnInitDialog()			
01217	{			
01218	CPropertyPage::OnInitDialog();			
01219	}			
1046	No Function arguments or return types	Next	Prev	Top
01216	BOOL CImportDataP1::OnInitDialog()			
01217	{			
01218	CPropertyPage::OnInitDialog();			
01219	}			
1046	No Function arguments or return types	Next	Prev	Top
1129	No Return statement for function	Next	Prev	Top
01306	void CImportDataP1::OnCancel()			
01307	{			
01308	CPropertyPage::OnCancel();			
01309	}			
01310				
01311	/*****\			
01312	** CImportDataP1::OnSetActive			
01313	**			
01314	** DESCRIPTION			
01315	** Called when the page is activated			
01316	**			
01317	*****/			
...				
...				
...				



Sample HTML-Reports under Windows

CC AUDITOR für Java - Output Results
Licensed by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.5
 DATE: 2011-05-22 16:39:39

Program : count.java
 Grade : W-2
 Grading : LOWEST

No	Report
1	AUDIT REPORT
2	DIAGNOSTIC REPORT
3	DIAGSUMM REPORT

CC AUDITOR für Java - Diagnostic Report (Full)
Licensed by: CASE CONSULT DEVELOPMENT
 (C) CC GmbH 2011 Release: 1.5
 DATE: 2011-05-22 16:39:39

Program : count.java
 Grade : W-2
 Grading : LOWEST

MetricId	Description	Count
1002	IF formatting violation	2
1006	FOR formatting violation	0
1008	TRY/CATCH formatting violation	0
1010	WHILE formatting violation	1
1012	More than 1 statement per line	0
1014	No blank line before class/intrf./method	1
1016	Loop stmts without curly braces	3
1017	Comment indentation violation	0
1018	No space between operands	1
1021	Wrong indentation of stmts within CASE	0
1024	Presence of Package stmt	0
1025	Presence of Import stmt	1

ANNOTATED SOURCE LISTING

[1025](#)
Presence of Import stmt
[Next](#)
[Prev](#)
[Top](#)

```
import java.io.*;
public class Count {
```

[1014](#)
No blank line before class/intrf./method
[Next](#)
[Prev](#)
[Top](#)

```
    public static void CountChars(Reader in) throws IOException
    {
        int count = 0;
```

[1010](#)
WHILE formatting violation
[Next](#)
[Prev](#)
[Top](#)
[1016](#)
Loop stmts without curly braces
[Next](#)
[Prev](#)
[Top](#)
[1018](#)
No space between operands
[Next](#)
[Prev](#)
[Top](#)

```
        while (in.read() != -1)
            count++;
        System.out.println("No. of chars counted =" + count);
    }
    public static void main(String[] args) throws Exception
    {
```

[1002](#)
IF formatting violation
[Next](#)
[Prev](#)
[Top](#)
[1016](#)
Loop stmts without curly braces
[Next](#)
[Prev](#)
[Top](#)

```
    if (args.length >= 1)
        CountChars(new FileReader(args[0]));
```

[1002](#)
IF formatting violation
[Next](#)
[Prev](#)
[Top](#)
[1016](#)
Loop stmts without curly braces
[Next](#)
[Prev](#)
[Top](#)

```
    else
        System.err.println("Enter the file name as arg to count chars");
    }
}
```



PL/I Sample Reports under z/OS

CC AUDITOR for PL/I Output Results
(C) CC GmbH 2011

Sample Source Code

```

QAPLI:
  PROC OPTIONS(MAIN);
  DFT RANGE (*) STATIC;
/* ***** */
/* $LS1 */ DCL 1 LSTP STATIC,
/* $LS2 */ 3 LSX CHAR(60) INIT(' $CCLS,K=CCI#TEST,M=0000,P=QAPLI ');
/* ***** */
DCL (ADDR,MOD,DIVIDE,SUBSTR,VERIFY,HIGH,
    LOW,HBOUND,STRING) BUILTIN;
...
CALL WRITEEXEC;
OPEN FILE(TABLESFILE) TITLE('UTSIPTABLE');
...
IF CTR1 = 30 THEN DO;
  GO TO READOLDMASTER;
END;
...
ELSE DO;
  IF NMTAXCD = 'B' ! ( NMDOE = '210' ! NMDOE = '219' ) THEN DO;
    STFEDTAXWHELD = STAMTTHISRUN * FEDTAX;
    NMAMTTHISRUN = STAMTTHISRUN -
      (STFEDTAXWHELD + STSTATAXWHELD);
  END;
END;
NMTOTAMTPAID = NMTOTAMTPAID + NMAMTTHISRUN;
END FIGURENMRUNAMT;
...
PUT SKIP LIST('NO OF NEG CHECKS ',NEGCKCNT);
END QAPLI;

```

Diagnostic Summary-Report

DATE: 2011-05-22 AUDITOR (R) DIAGNOSTIC SUMMARY REPORT PAGE 1
 TIME: 15:50:54 (C) CC GmbH 2011 PROGRAM: SAMPLE1
 LICENSED BY: CASE CONSULT DEVELOPMENT VERSION 5.4.0

STANDARD NUMBER	STANDARD NAME	-- # OF STANDARDS VIOLATIONS --		
		ACTUAL FOUND	FOR THE NEXT HIGHEST GRADE	FOR THE TOP GRADE
65	ESSENTIAL COMPLEXITY	76	12	10
66	# OF INVALID GO TO'S	74	15	0
	409 412 416 423 427 430 440 444			
	888 892 898 903 914 956 1069 1074			...
	1081 1087			



PL/I Sample Reports under z/OS

Diagnostic Report

```
/*QA *****/
/*QA * DATE: 2011-05-22 AUDITOR (R) DIAGNOSIC REPORT */
/*QA * TIME: 15:50:53 (C) CC GmbH 2011 */
/*QA *****/
...
QAPLI:
PROC OPTIONS(MAIN);
/*QA * #059 PROGRAM ENTRY POINT IDENTIFIED */
DFT RANGE (*) STATIC;
/*QA * #044 DEFAULT RANGE (*) STATIC FOUND. */
/* ***** */
/* $LS1 */ DCL 1 LSTP STATIC,
/*QA * #040 UNREFERENCED DATA */
/* $LS2 */ 3 LSX CHAR(60) INIT(' $CCLS,K=CCI#TEST,M=0000,P=QAPLI ');
/*QA * #040 UNREFERENCED DATA */
DCL (ADDR,MOD,DIVIDE,SUBSTR,VERIFY,HIGH,
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
/*QA * #040 UNREFERENCED DATA */
...
CALL WRITEEXC;
/*QA * #010 MAINLINE VERB: CALL */
/*QA * #062 UNIQUE MAINLINE CALL FOUND. */
OPEN FILE(TABLESFILE) TITLE('UTSIPTABLE');
/*QA * #017 NUMBER OF TIMES FILE OPENED. */
...
IF CTRL1 = 30 THEN DO;
/*QA * #012 WORD: THEN */
GO TO READOLDMASTER;
/*QA * #065 ESSENTIAL COMPLEXITY INCREASED. */
/*QA * #066 INVALID GO TO. TARGET: READOLDMASTE */
END;
...
ELSE DO;
/*QA * #028 TOO MANY STATEMENTS IN PROCEDURE. */
IF NMTAXCD = 'B' ! ( NMDOE = '210' ! NMDOE = '219' ) THEN DO;
/*QA * #012 WORD: THEN */
/*QA * #064 TOO MANY TEST CASES IN PROCEDURE. */
STFEDTAXWHELD = STAMTTHISRUN * FEDTAX;
NMAMTTHISRUN = STAMTTHISRUN -
(STFEDTAXWHELD + STSTATAXWHELD);
END;
END;
NMTOTAMTPAID = NMTOTAMTPAID + NMAMTTHISRUN;
END FIGURENMRUNAMT;
...
PUT SKIP LIST('NO OF NEG CHECKS ',NEGCKCNT);
/*QA * #007 VERB: PUT */
/*QA * #060 HIDDEN MAINLINE STATEMENT FOUND. */
END QAPLI;
/*QA * #058 PROGRAM EXIT IDENTIFIED. */
/*QA * #065 ESSENTIAL COMPLEXITY INCREASED. */
```



PL/I Sample Reports under z/OS

AUDIT Report

PROGRAM: SAMPLE1 AUDITOR (R) AUDIT REPORT 2011-05-22 15:50:54
 GRADE: S 2 (C) CC GmbH 2011
 LICENSED BY: CASE CONSULT DEVELOPMENT VERSION 5.2.0
 STANDARD: GENERAL PL/I STANDARD SET C (LOWEST+ GRADING)

STANDARD	#	GRADE				
		OK	I	W	E	S
VERB COUNTS		!	!	!	!	!
1 ALLOCATE'S FOUND	0	000	N/A	N/A	N/A	!
2 DISPLAY'S FOUND	0	000	N/A	N/A	N/A	!
...						
7 PUT'S FOUND	12	000	===N/A	N/A	N/A	!
8 WAIT'S FOUND	0	000	N/A	N/A	N/A	!
9 MAINLINE ASSIGNMENT'S	158	020	===N/A	N/A	N/A	!
10 MAINLINE CALL'S	20	030	N/A	N/A	N/A	!
WORD COUNTS		!	!	!	!	!
11 INCLUDE'S FOUND	0	N/A	N/A	N/A	N/A	!
12 THEN'S FOUND	94	N/A	N/A	N/A	N/A	!
DECLARE ATTRIBUTE COUNTS		!	!	!	!	!
13 BACKWARDS ATTRIBUTE FOUND	0	000	N/A	N/A	N/A	!
14 GENERIC ATTRIBUTE FOUND	0	000	N/A	N/A	N/A	!
15 LABEL ATTRIBUTE FOUND	0	000	N/A	N/A	N/A	!
VERB STATISTICS		!	!	!	!	!
16 PROCS WITH > 5 LITERALS	2	005	N/A	N/A	N/A	!
17 MAXIMUM OPENS PER FILE	1	001	002	N/A	N/A	!
...						
COMMENT ANALYSIS		!	!	!	!	!
21 VALUABLE COMMENTS	48	030	020	010	N/A	!
22 PROCEDURE VALUABLE COMMENTS	25	020	010	005	N/A	!
23 PROC'S W/O 10 HEADER CMMTS	10	N/A	N/A	N/A	N/A	!
SIZE ANALYSIS		!	!	!	!	!
24 MAINLINE STATEMENTS	483	050	===N/A	N/A	N/A	!
25 PROCEDURE STATEMENTS (100S)	628	N/A	N/A	N/A	N/A	!
...						
28 # OF PROC'S OVER 15 STMTS	3	000	===N/A	N/A	N/A	!
29 # OF PROC'S OVER 40 LINES	0	000	N/A	N/A	N/A	!
...						



PL/I Sample Reports under z/OS

```

...
DATA DIVISION ANALYSIS
32 INTERNAL TABLES          0 005 N/A N/A N/A !
33 1-DIMENSIONAL ARRAY      0 005 N/A N/A N/A !
36 TOTAL OUTPUT FILES        9 005===005===N/A N/A !
37 TOTAL UPDATE FILES        0 005 005 N/A N/A !
38 FILE DECLARES W/O ENV     0 000 000 N/A N/A !
39 FILE DECLARES W/O TOTAL   0 000 000 N/A N/A !
40 UNREFERENCED DATA ELEMENTS 207 005===010===N/A N/A !
41 LOCAL DECLARES            0 000 005 N/A N/A !
42 TOTAL LABEL FIELDS        0 N/A N/A N/A N/A !
43 SMALL(<3 CHAR)DATA NAMES  0 000 010 N/A N/A !
STANDARDS ANALYSIS
44 DEFAULT RANGE (*) STATIC  1 001 001 001 N/A !
45 COMMENTED CODE FOUND (#2) 0 010 N/A N/A N/A !
...
50 ON ERROR CONDITIONS FOUND  0 001 N/A N/A N/A !
51 ON CONDITIONS NOT TOGETHER 0 000 N/A N/A N/A !
52 NULL ELSE'S (ELSE;) FOUND  0 000 N/A N/A N/A !
53 NULL THEN'S (THEN;) FOUND  0 000 N/A N/A N/A !
54 EXCESSIVELY COMPLEX IF'S   2 000===005 010 020 !
55 EXCESSIVELY COMPLEX DO'S   0 000 005 010 020 !
56 EXCESSIVELY COMPLEX SELECT'S 0 000 005 010 020 !
FORMATTING ANALYSIS
57 MULTIPLE VERBS PER LINE    1 000===000===N/A N/A !
STRUCTURE ANALYSIS
58 NUMBER OF PROGRAM EXITS     2 001===N/A N/A N/A !
59 NUMBER OF PROGRAM ENTRIES   1 001 N/A N/A N/A !
60 HIDDEN MAINLINE STATEMENTS 344 000===000===005===N/A !
61 UNREFERENCED PROCEDURES     0 000 000 000 005 !
62 % MAINLINE CALLS TO PROCS   80% N/A N/A N/A N/A !
63 CYCLOMATIC COMPLEXITY       151 N/A N/A N/A N/A !
64 PROC'S > 5 TEST CASES       3 002===N/A N/A N/A !
65 ESSENTIAL COMPLEXITY        76 010===010===012===012***!
66 # OF INVALID GO TO'S       74 000===000===015===015***!
=====

```

THIS IS A SAMPLE STANDARD FILE TO BE USED WITH LOWEST OR LOWEST+ GRADING.
 YOUR ORGANIZATION CAN ADD, DELETE, AND TUNE THESE STANDARDS TO MATCH
 YOUR DEFINITION OF PL/I PROGRAMMING QUALITY.



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