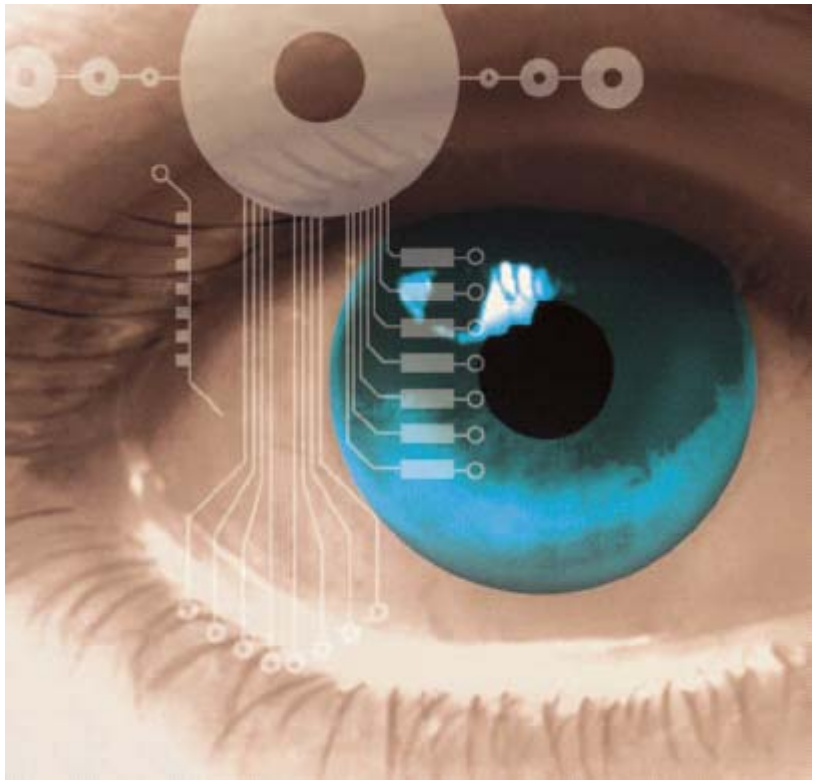
EmbeddedCraft
crafting of intelligent systems

IAR WORKBENCH FOR 8051
PART3

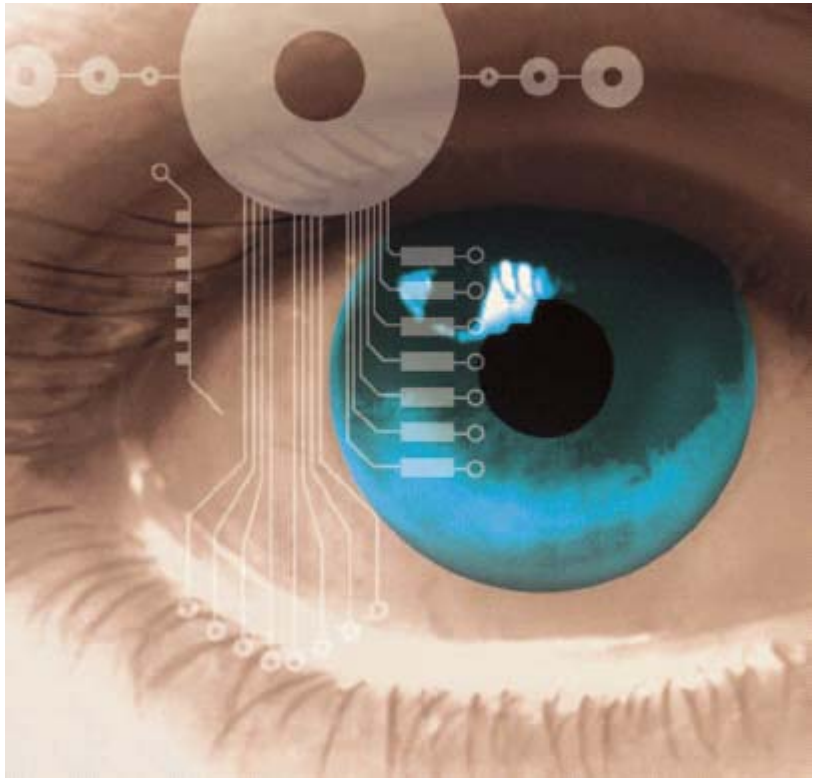
CONTENTS

Advance debugging

1. Profiling
2. Code coverage
3. Breakpoints
4. Tracing
5. Simulation of interrupts



Tool



C- SPY debugger

Must Remember 1/2

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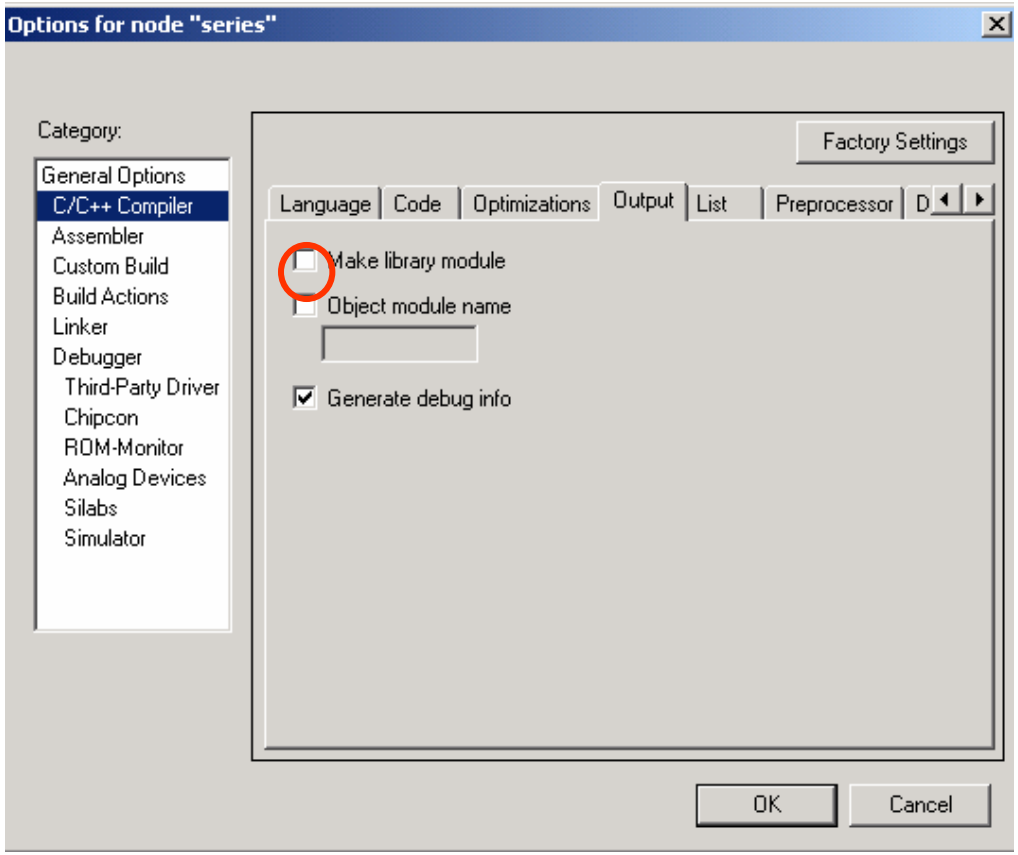
Output file should have debug information



Must Remember 2/2

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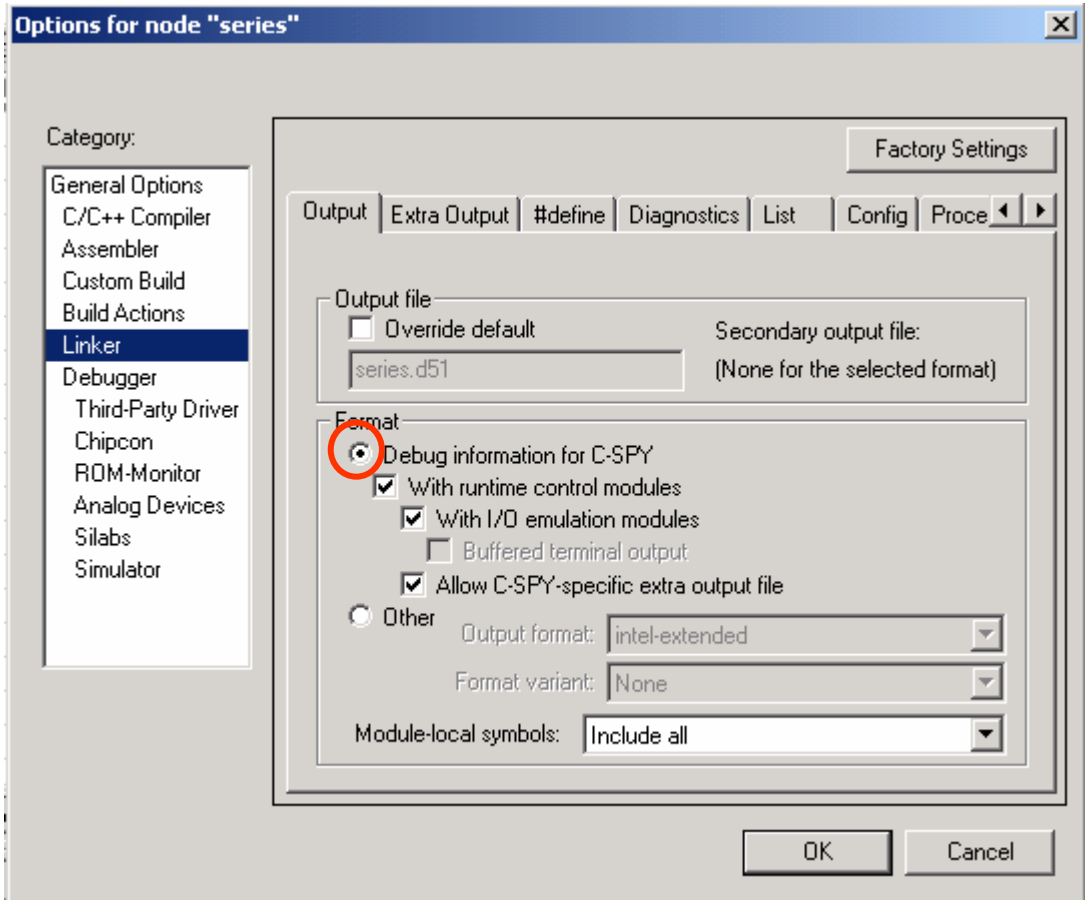
Linker Format: debugging information for debugging



Profiling

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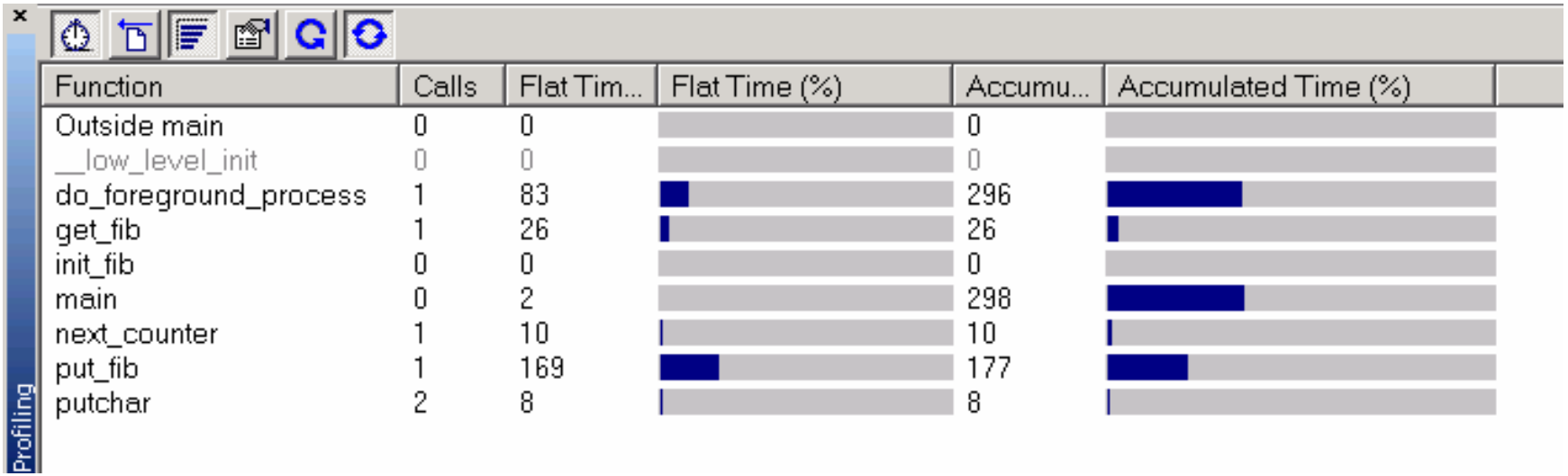
- Display time consumed in each function
- So that user can check, which function is taking more CPU time and identify bottle neck problem,
- This will help to make code fast and



Function	Calls	Flat Tim...	Flat Time (%)	Accumu...	Accumulated Time (%)
Outside main	0	0		0	
__low_level_init	0	0		0	
do_foreground_process	1	83		296	
get_fib	1	26		26	
init_fib	0	0		0	
main	0	2		298	
next_counter	1	10		10	
put_fib	1	169		177	
putchar	2	8		8	

Profiling/Code Coverage/Trace

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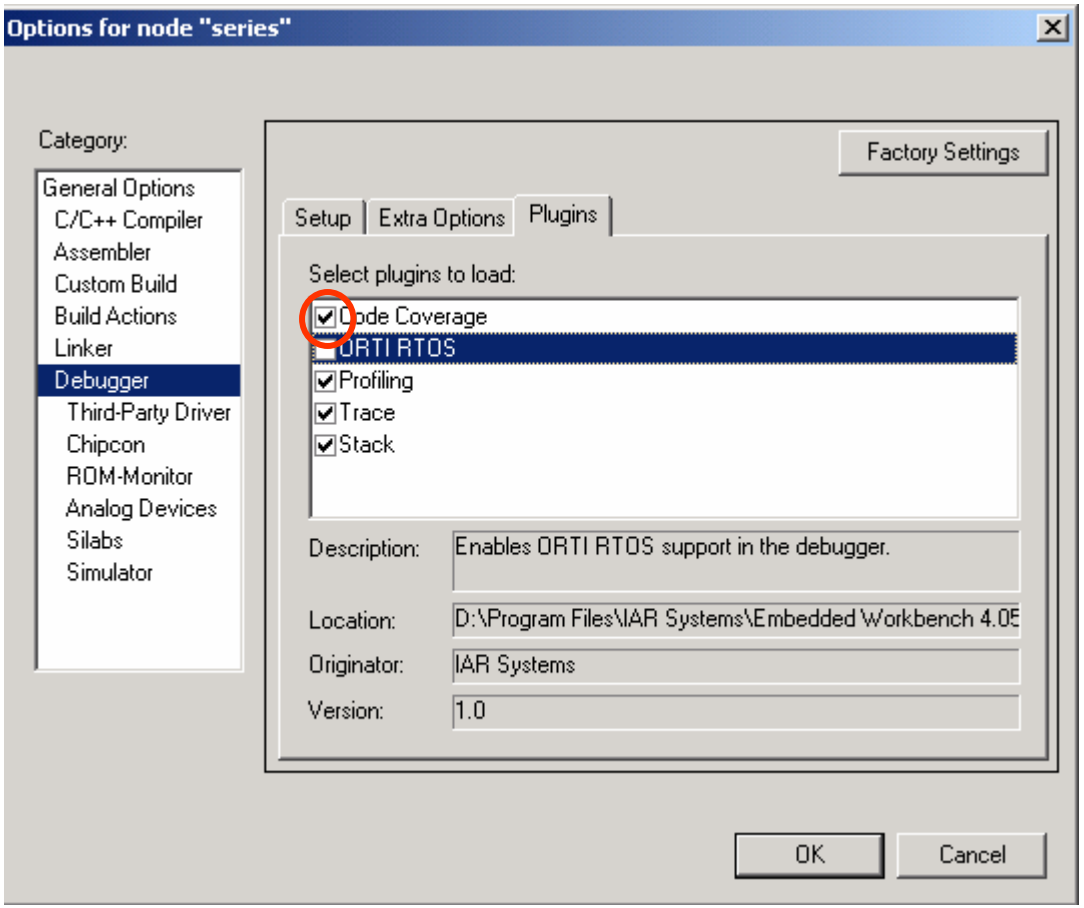
- These are to be loaded as plugins
- So enable them from
- General options > Debugger > Plugins



Profiling/Code Coverage/Trace

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- These are to be loaded as plugins
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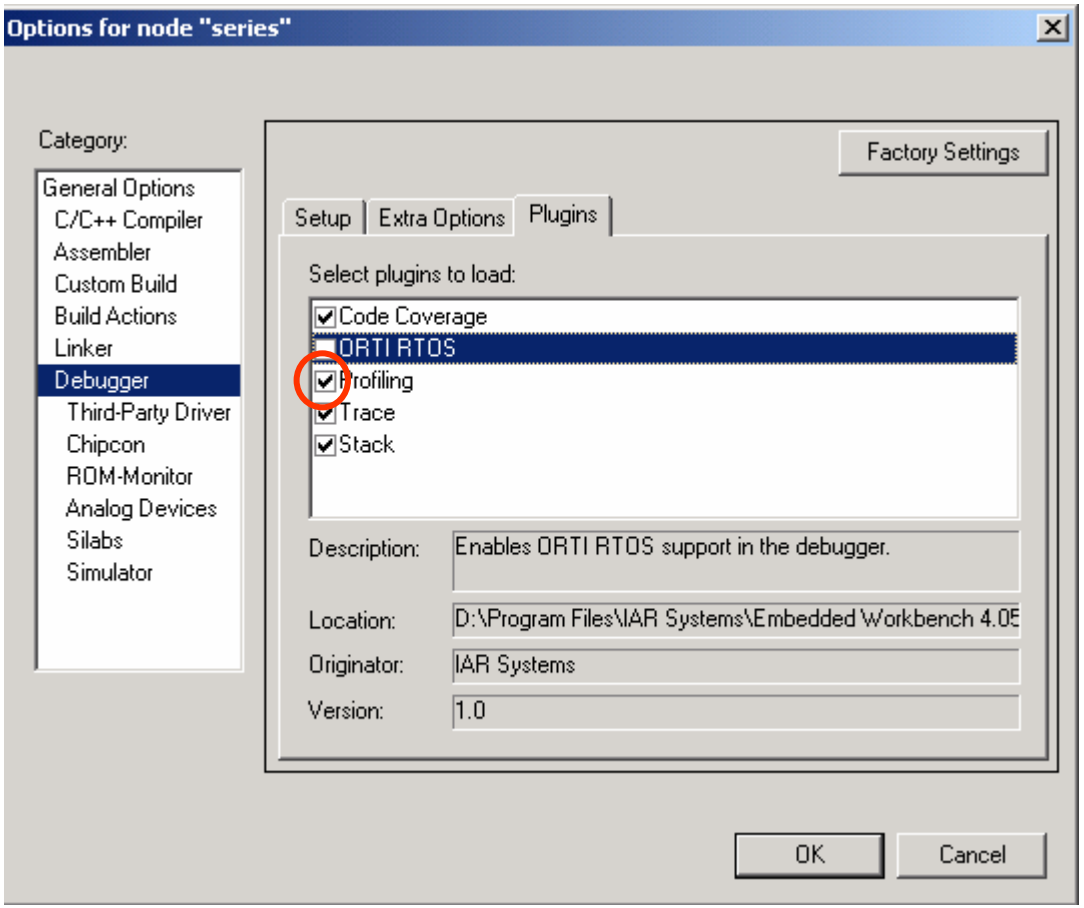
- General options > Debugger > Plugins



Profiling/Code Coverage/Trace

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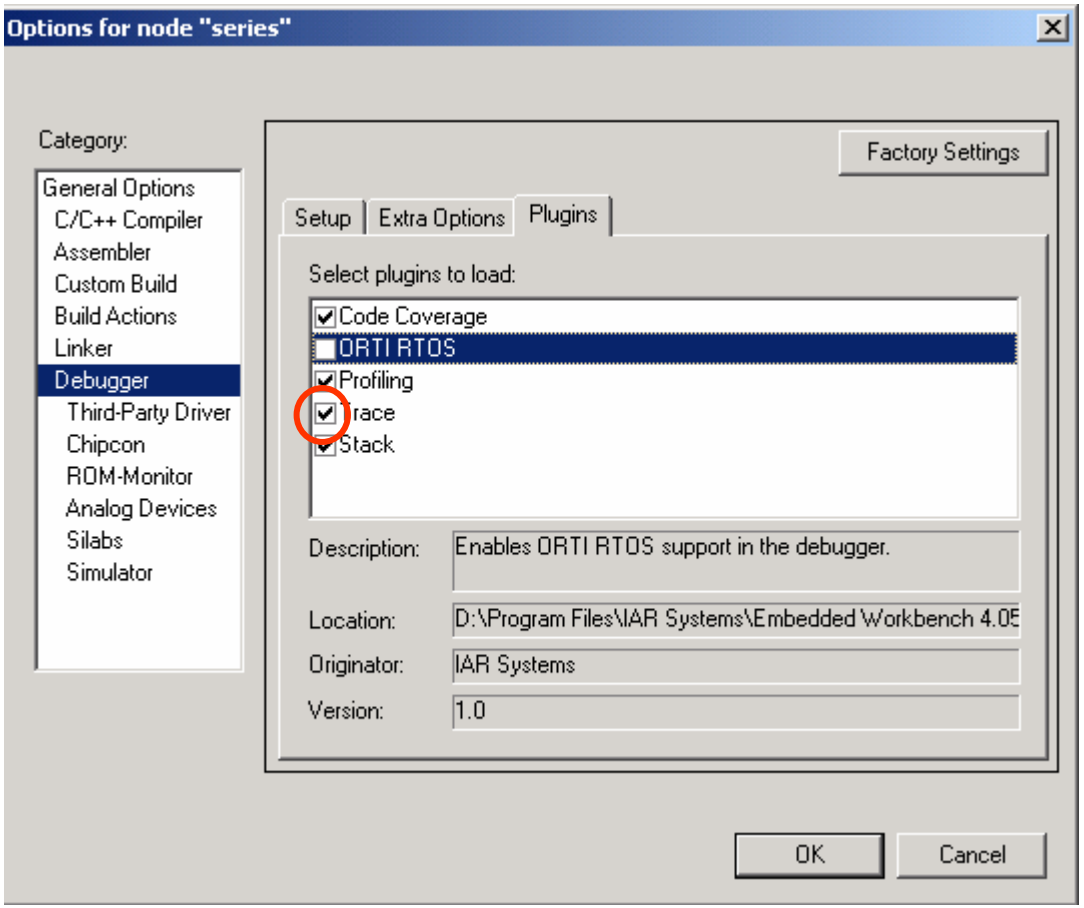
- These are to be loaded as plugins
- So enable them from
- General options > Debugger > Plugins



Profiling: open profiling window

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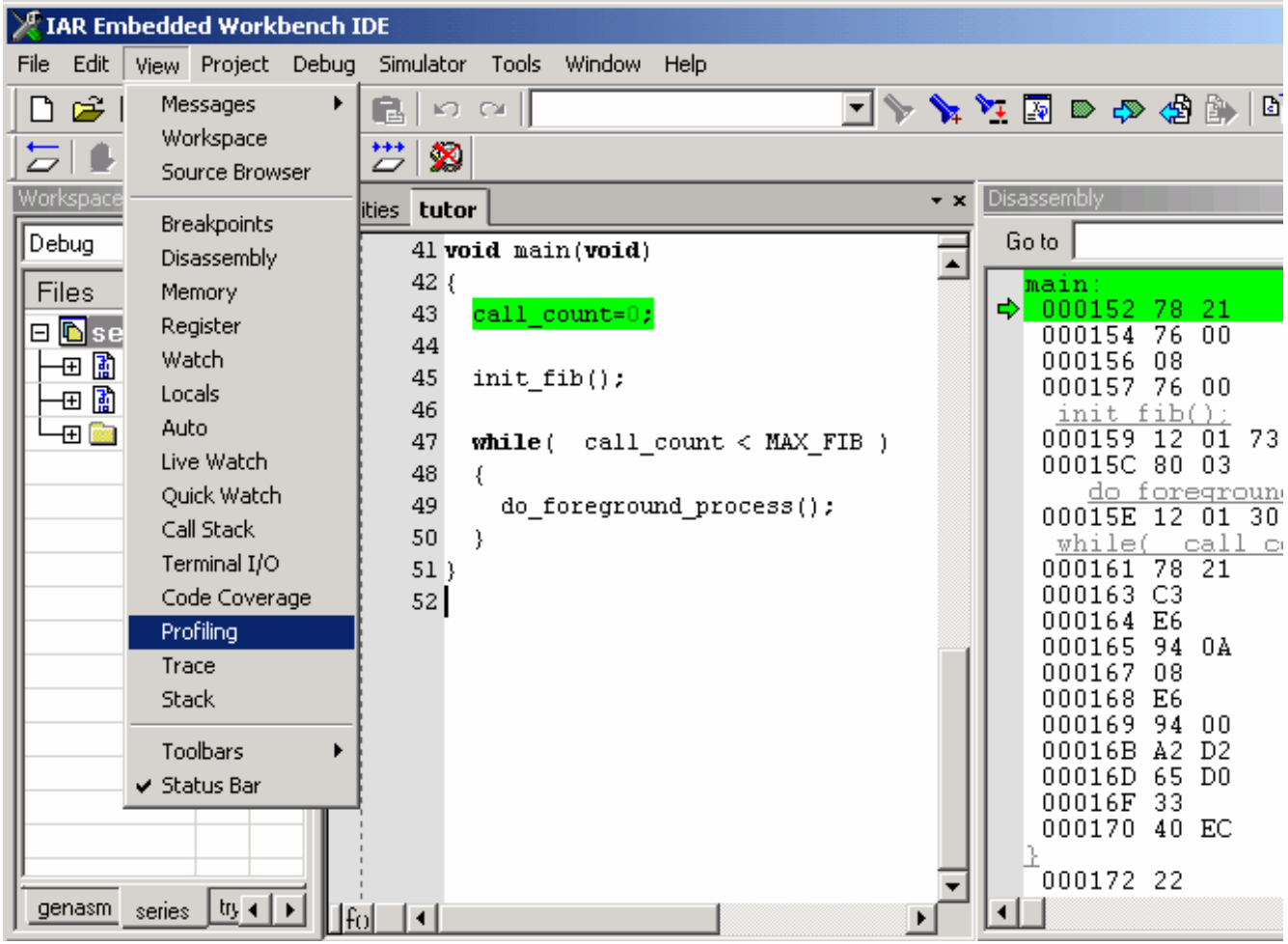
Open project **series** >> rebuild >> open Debugger



Profiling: Enabling profile

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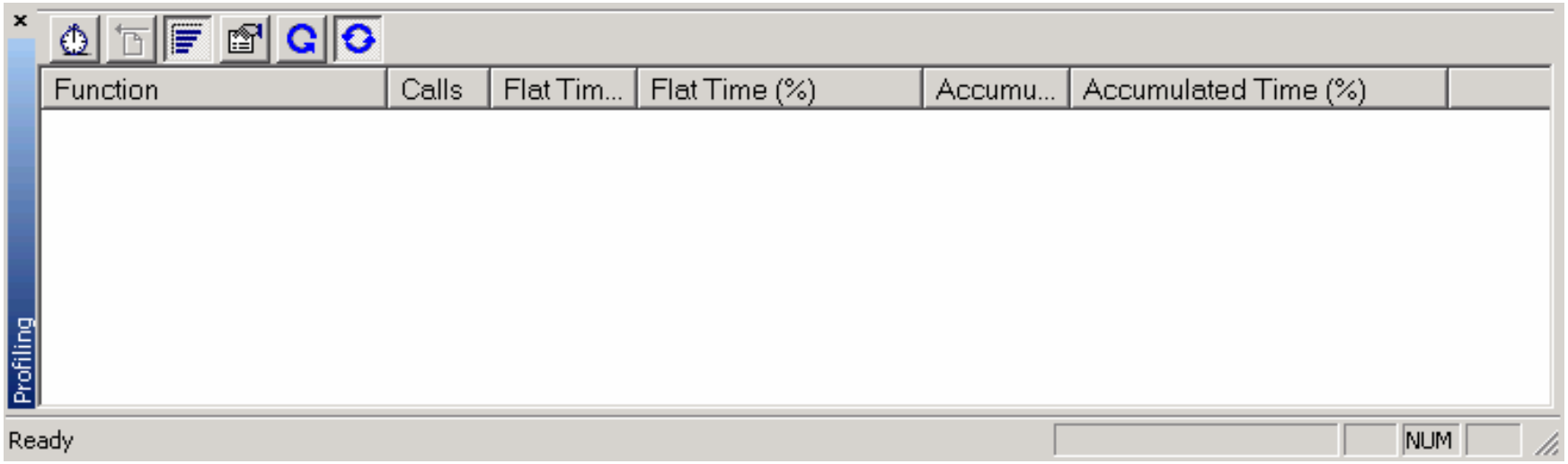
Enable Profile



Profiling: Enabling profile

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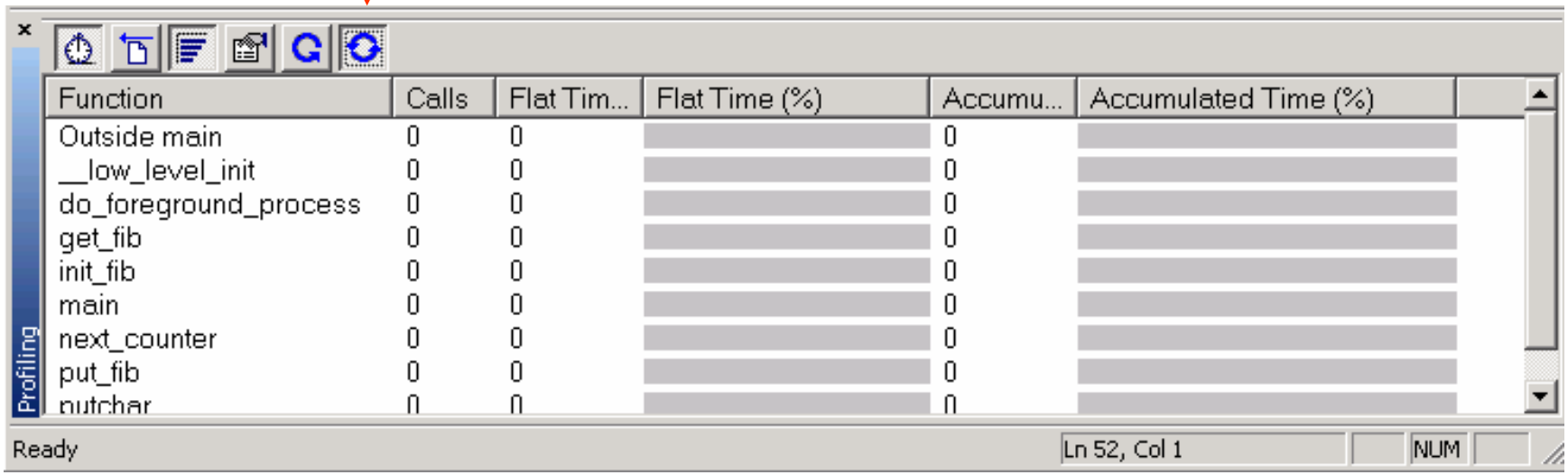
Auto Refresh



Profiling: Collecting profiling information

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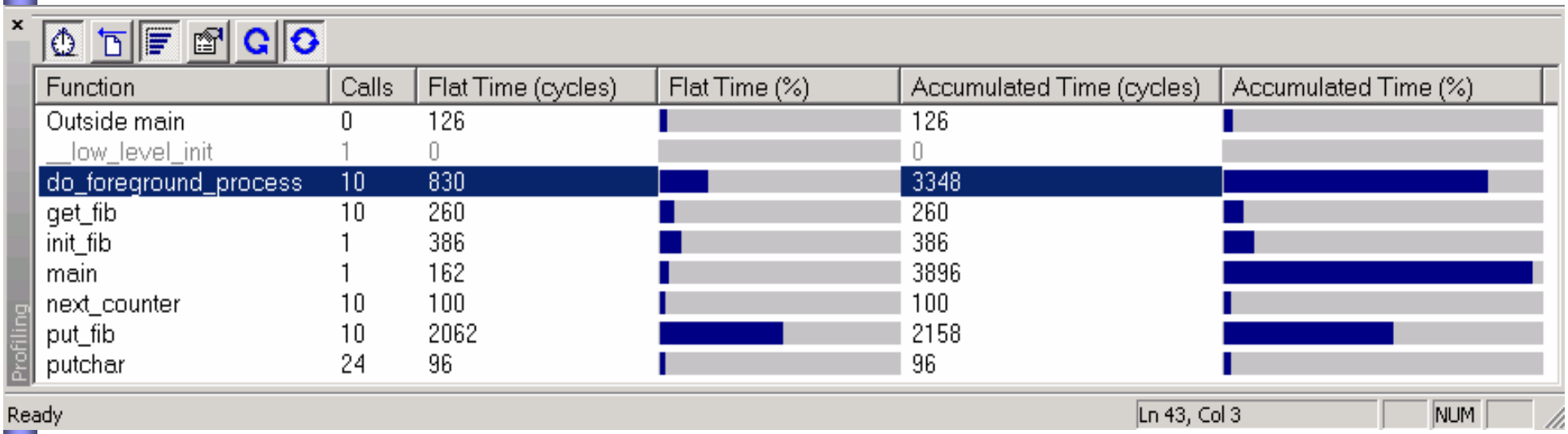
Reset and Run the code either upto any breakpoint or full

And profile information will be displayed



Profiling

Function	Calls	Flat Time (cycles)	Flat Time (%)	Accumulated Time (cycles)	Accumulated Time (%)
Outside main	0	126		126	
__low_level_init	1	0		0	
do_foreground_process	10	830		3348	
get_fib	10	260		260	
init_fib	1	386		386	
main	1	162		3896	
next_counter	10	100		100	
put_fib	10	2062		2158	
putchar	24	96		96	

Ready | Ln 43, Col 3 | NUM

Profiling: Detail of any function 1/2

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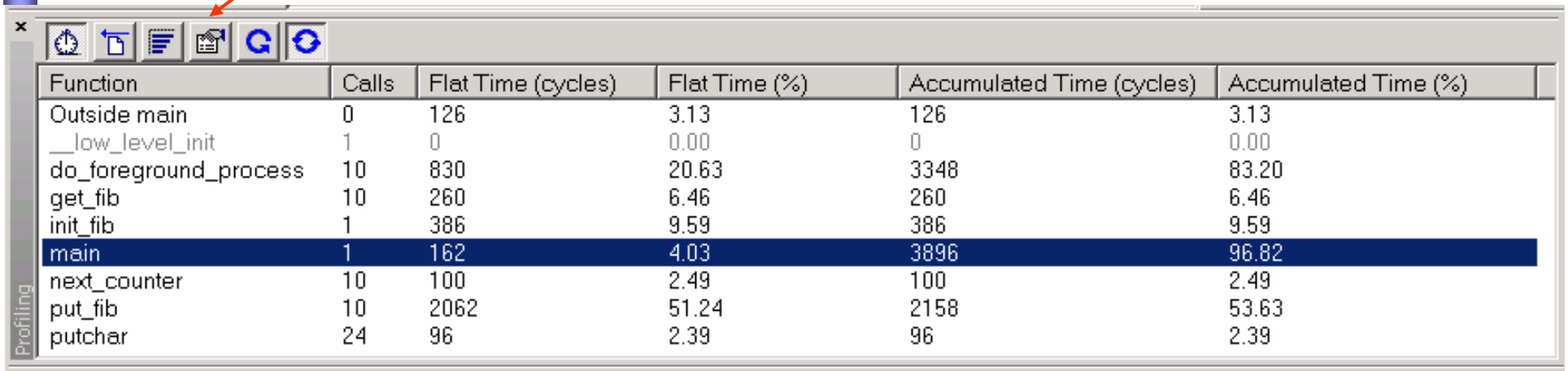
Select function
and
click on detail



Profiling

Function	Calls	Flat Time (cycles)	Flat Time (%)	Accumulated Time (cycles)	Accumulated Time (%)
Outside main	0	126	3.13	126	3.13
__low_level_init	1	0	0.00	0	0.00
do_foreground_process	10	830	20.63	3348	83.20
get_fib	10	260	6.46	260	6.46
init_fib	1	386	9.59	386	9.59
main	1	162	4.03	3896	96.82
next_counter	10	100	2.49	100	2.49
put_fib	10	2062	51.24	2158	53.63
putchar	24	96	2.39	96	2.39

Profiling: Detail of any function 2/2

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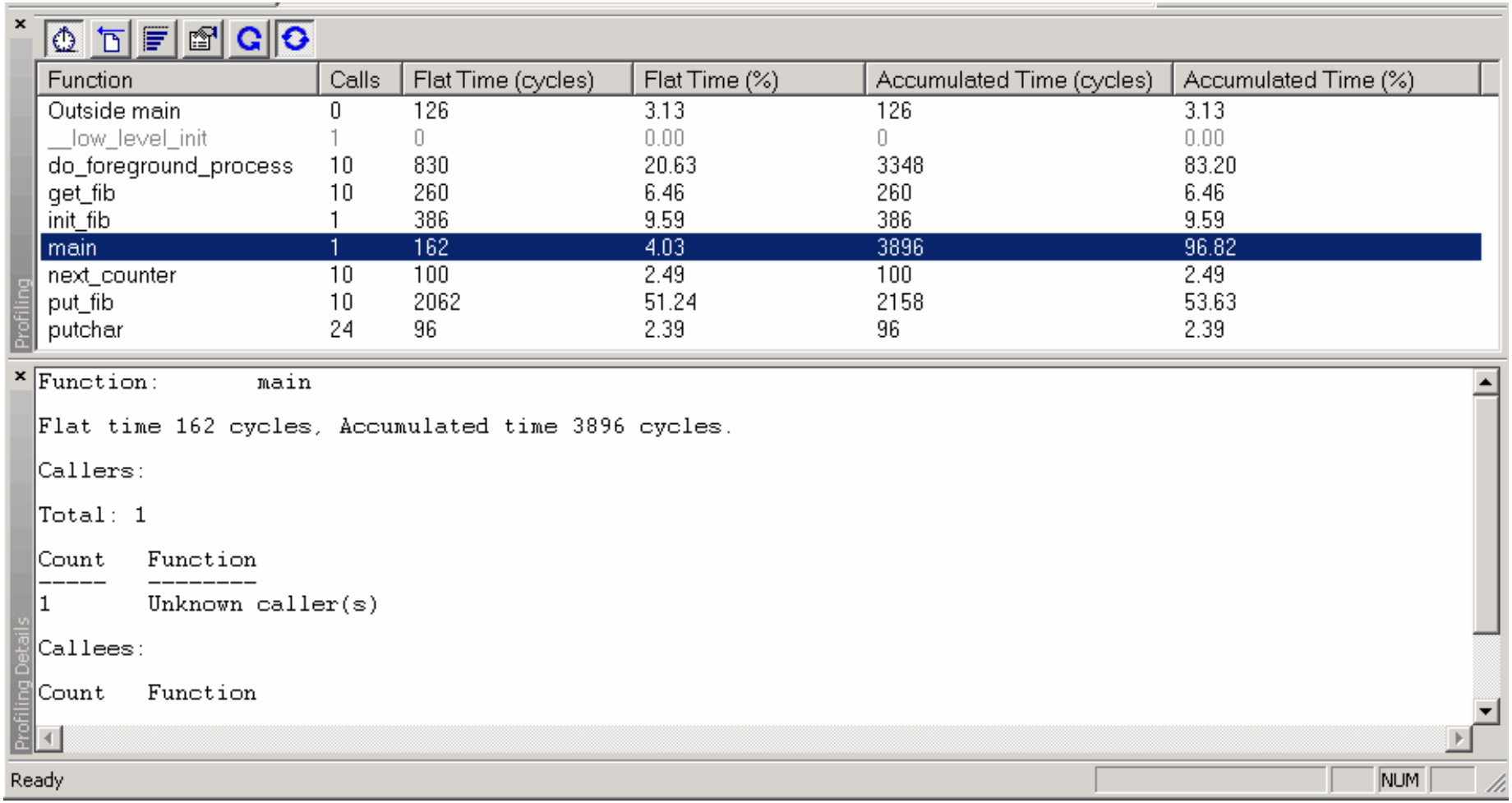

Profiling

Function	Calls	Flat Time (cycles)	Flat Time (%)	Accumulated Time (cycles)	Accumulated Time (%)
Outside main	0	126	3.13	126	3.13
__low_level_init	1	0	0.00	0	0.00
do_foreground_process	10	830	20.63	3348	83.20
get_fib	10	260	6.46	260	6.46
init_fib	1	386	9.59	386	9.59
main	1	162	4.03	3896	96.82
next_counter	10	100	2.49	100	2.49
put_fib	10	2062	51.24	2158	53.63
putchar	24	96	2.39	96	2.39

Profiling Details

```
Function:       main

Flat time 162 cycles, Accumulated time 3896 cycles.

Callers:

Total: 1

Count    Function
-----    --------
1        Unknown caller(s)

Callees:

Count    Function
```

Ready NUM

Trace

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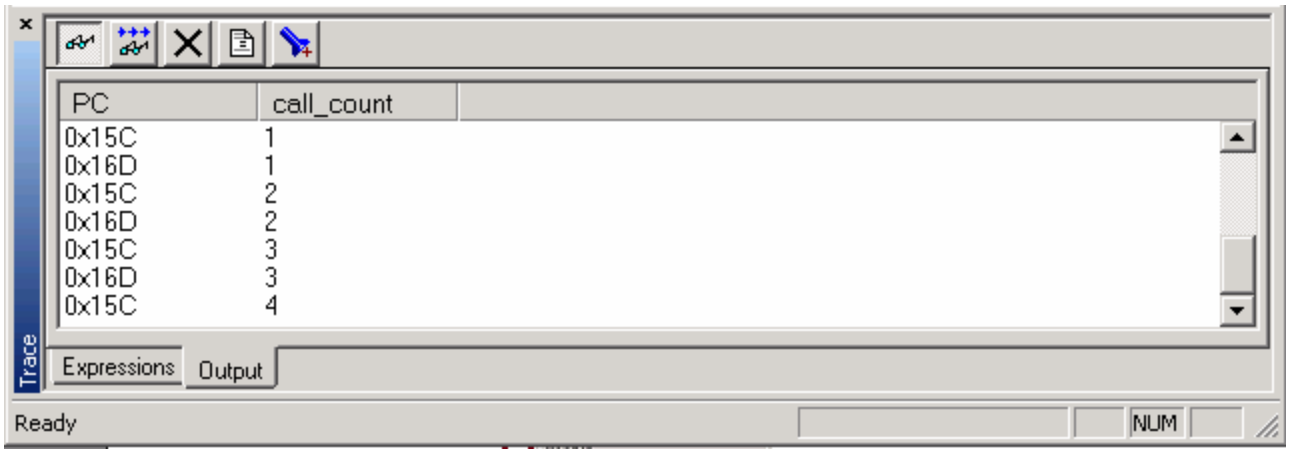
Display the execution of code, step by step,

can trace the value of any variable, after each line of execution



Trace: setting 1

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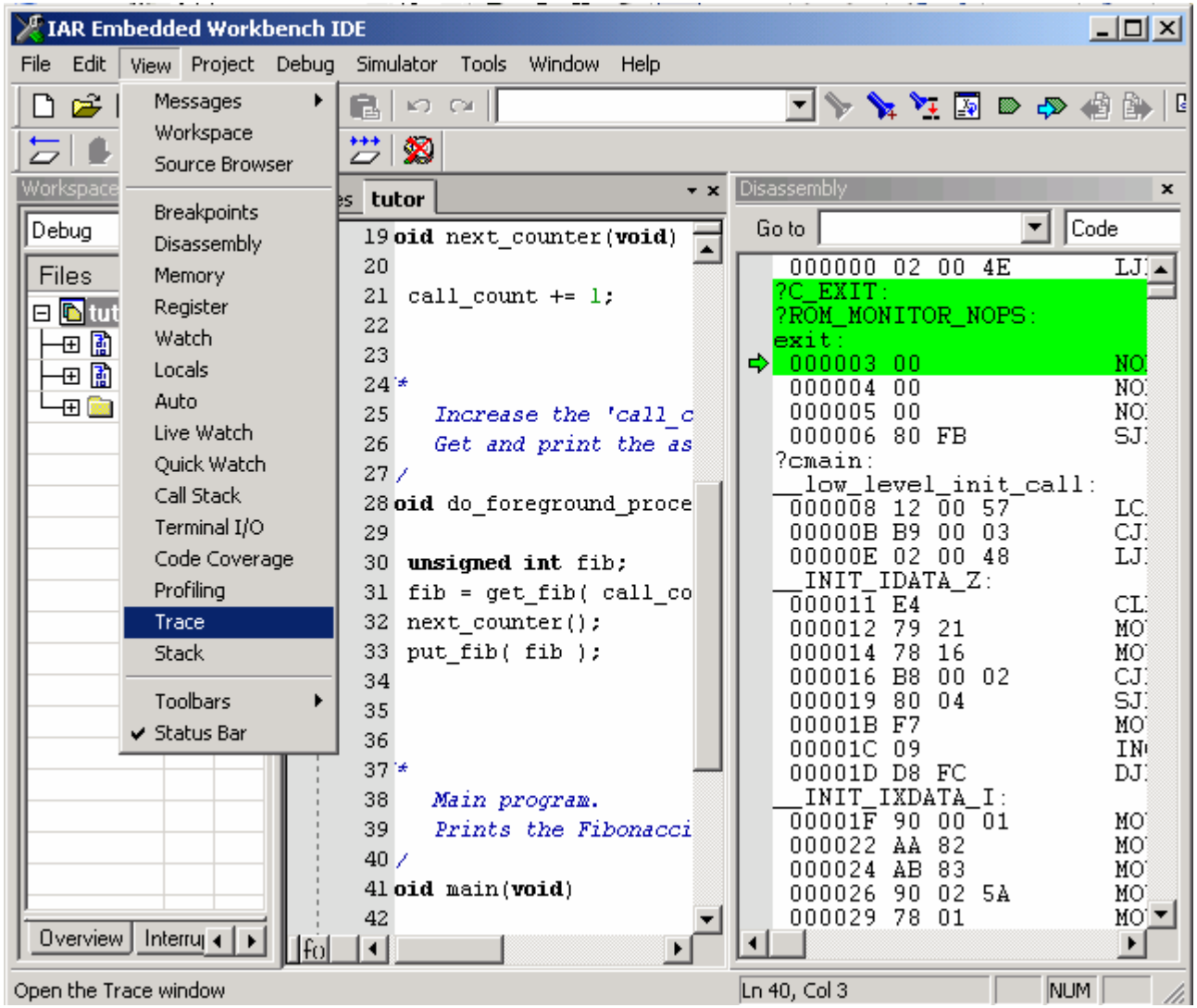
Open series project >> compile >> debug



Trace: setting 2

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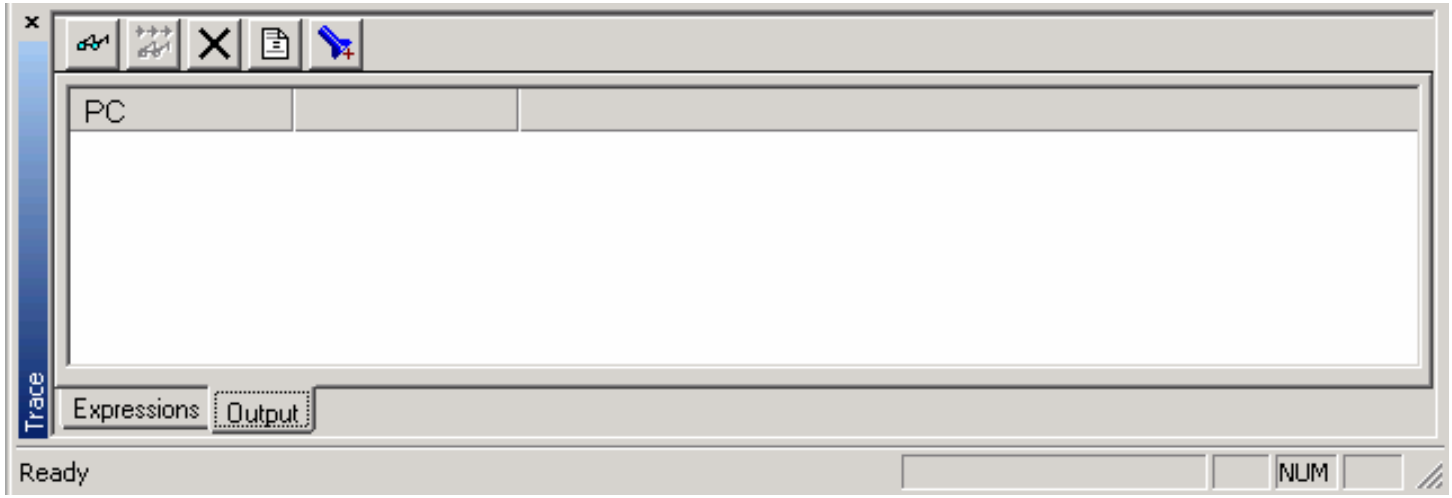
Watch window



Trace: setting 3

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Two Tabs

Enter the value of variable, want to examine

Trace: setting 3

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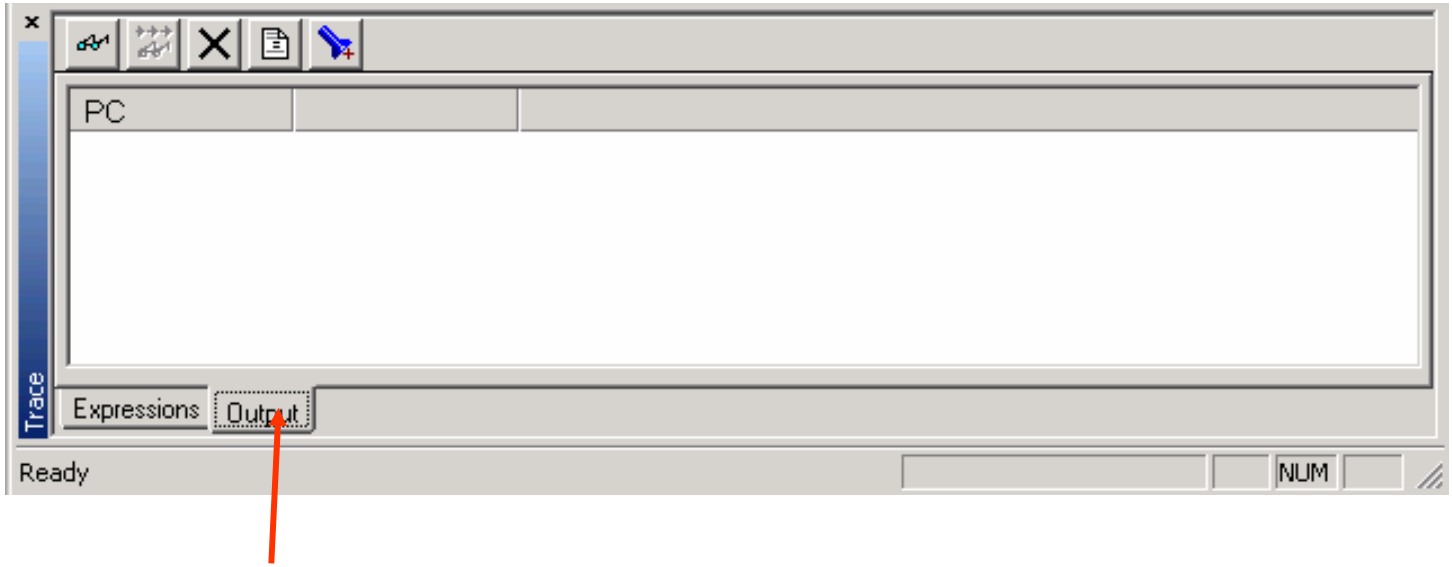
Two Tabs



Display the output

Trace: setting 4

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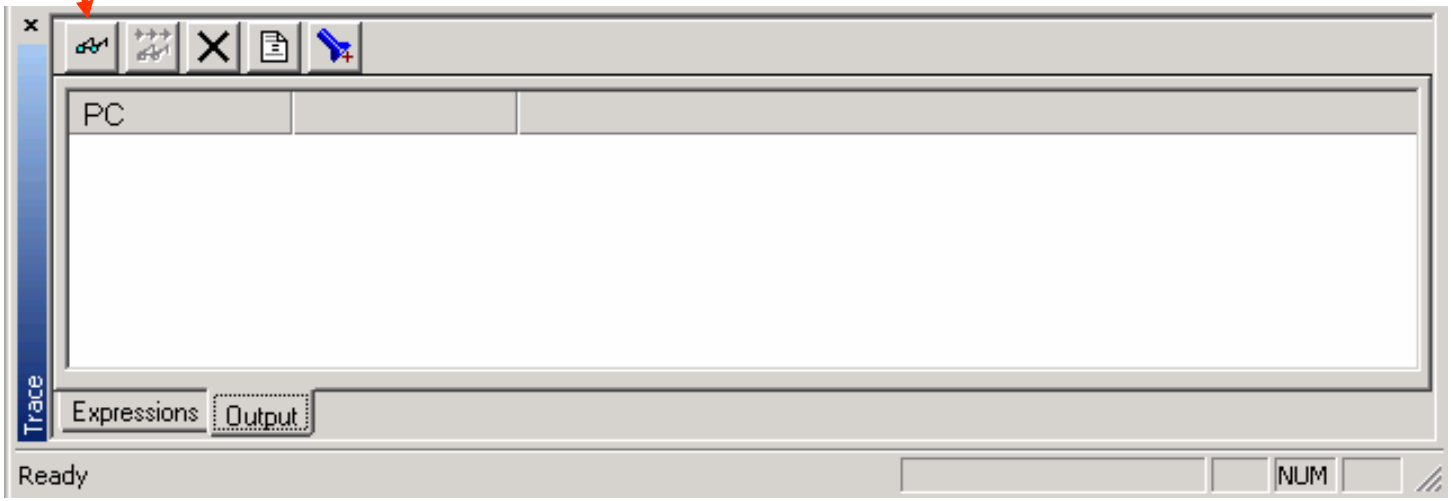
Enable trace

Enable Trace



Trace: setting 5

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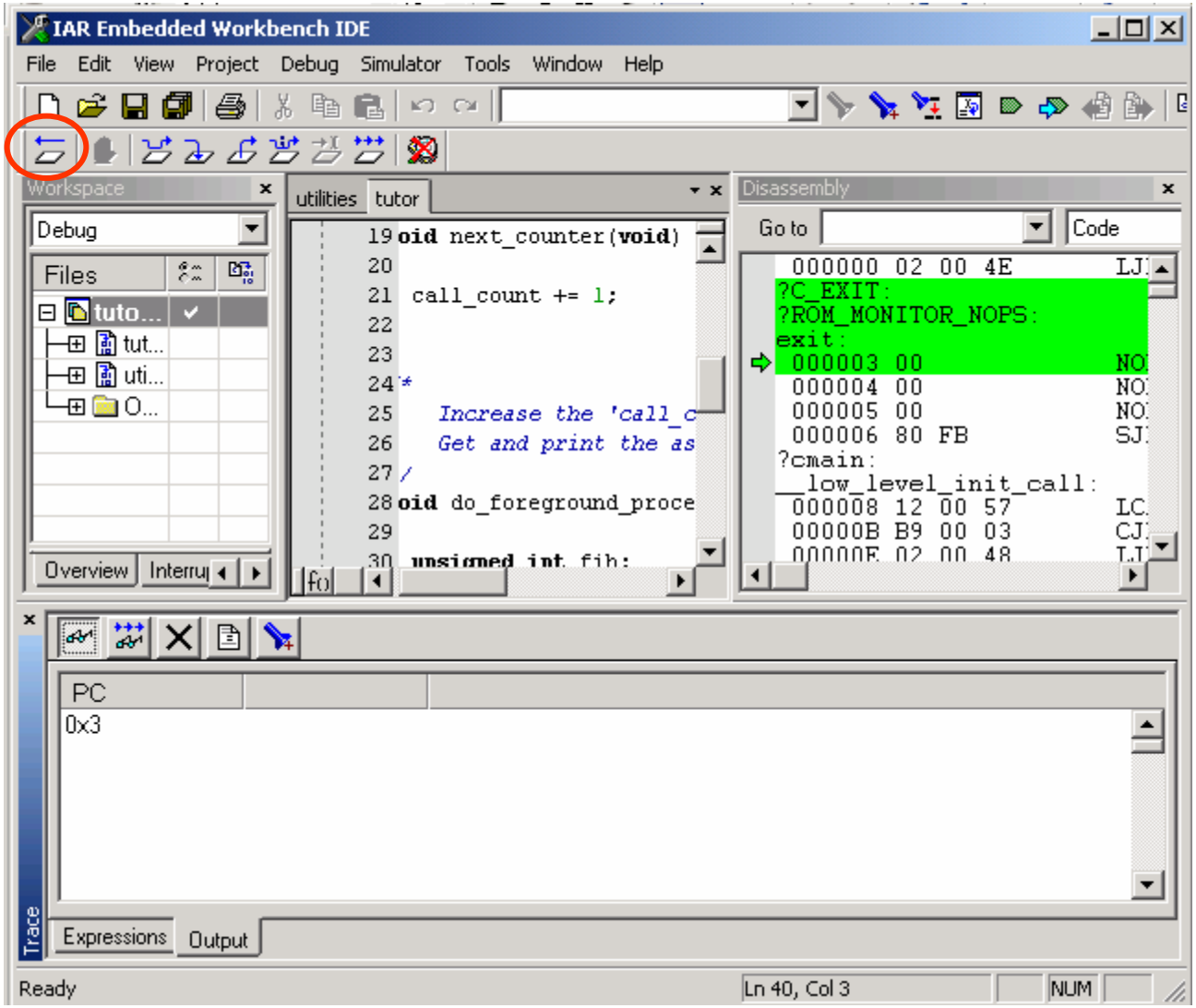
Reset



Trace: setting 6

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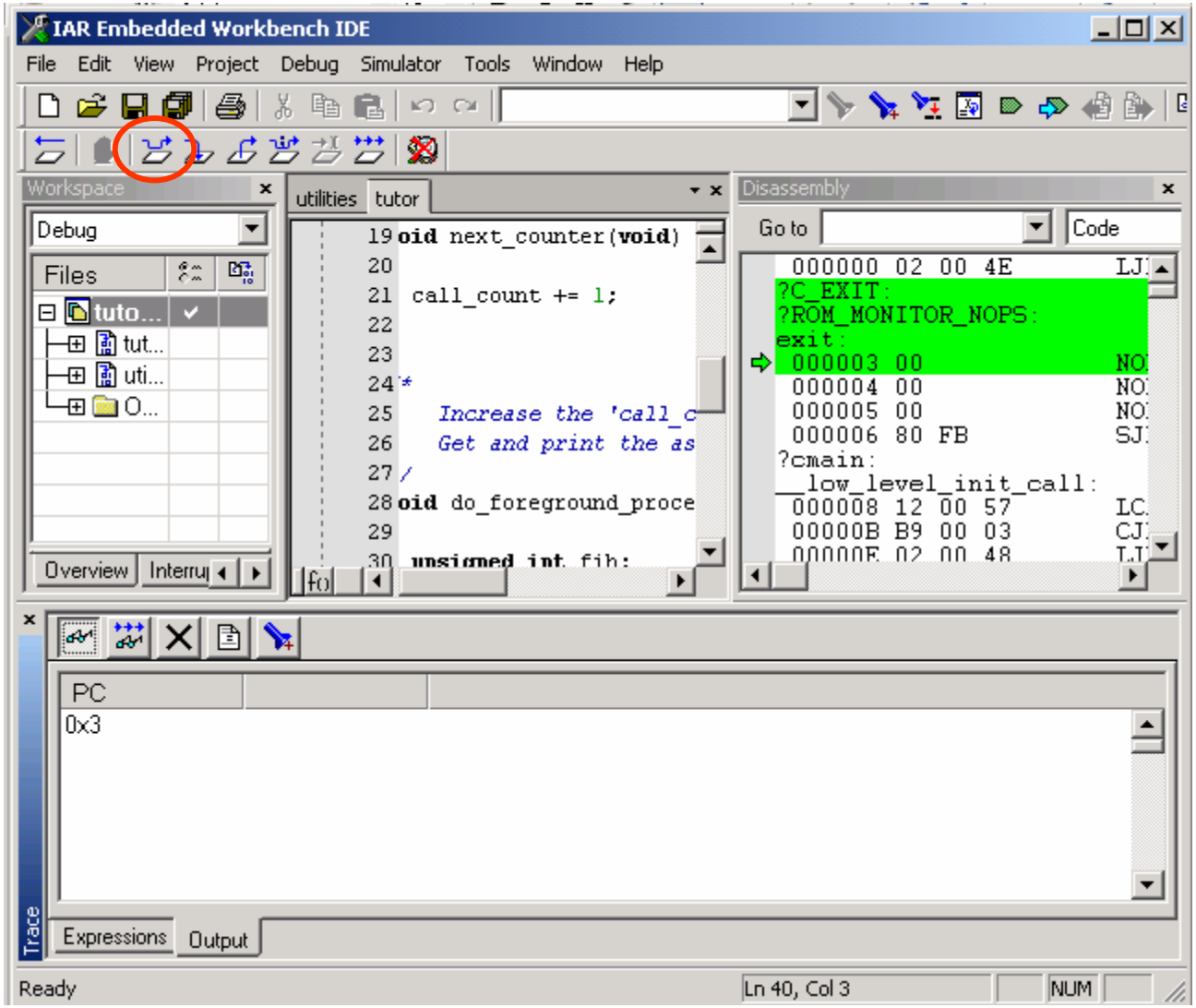
Execute Code step by step



Trace: setting 7

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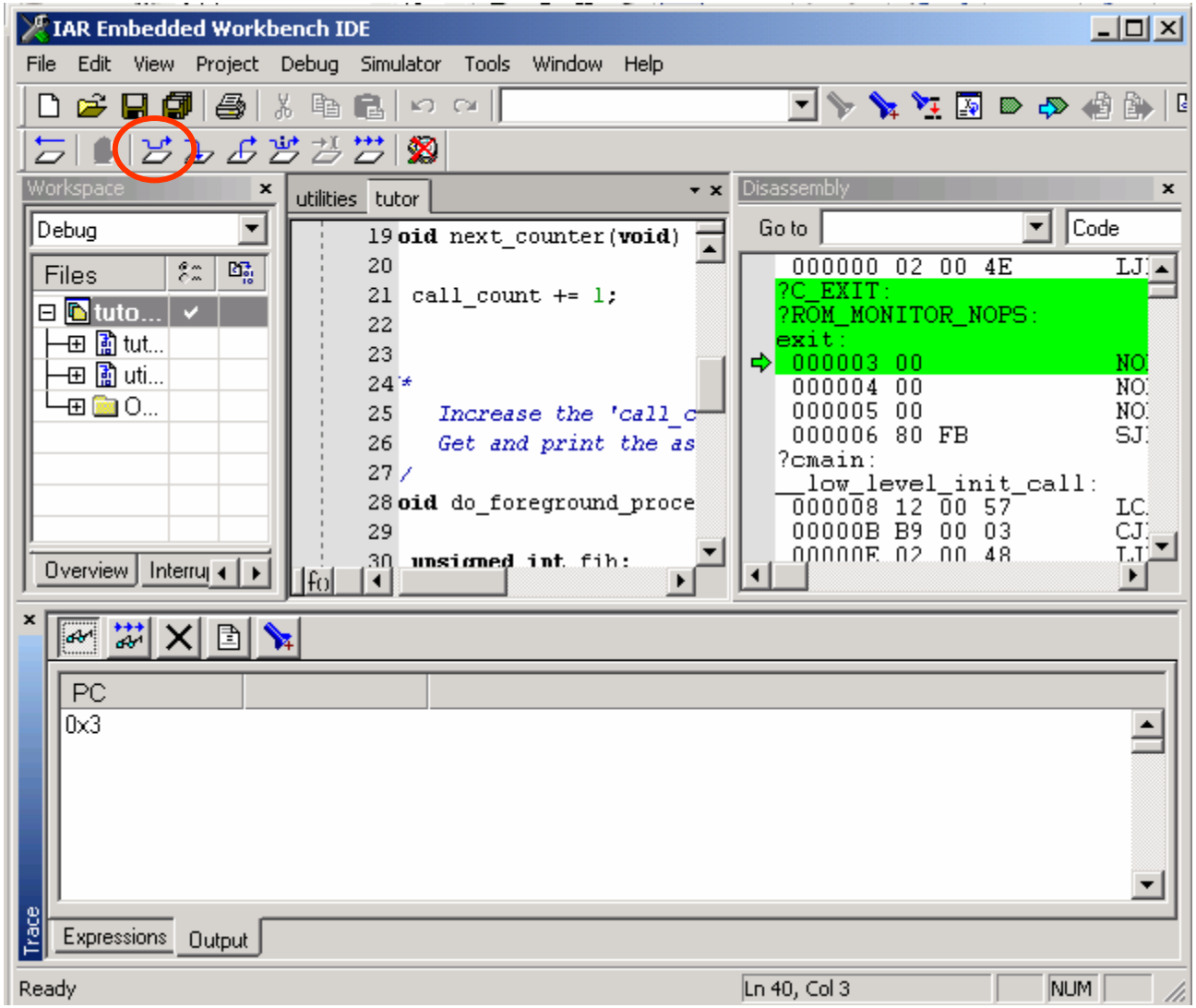
Execute Code step by step



Trace: setting 8

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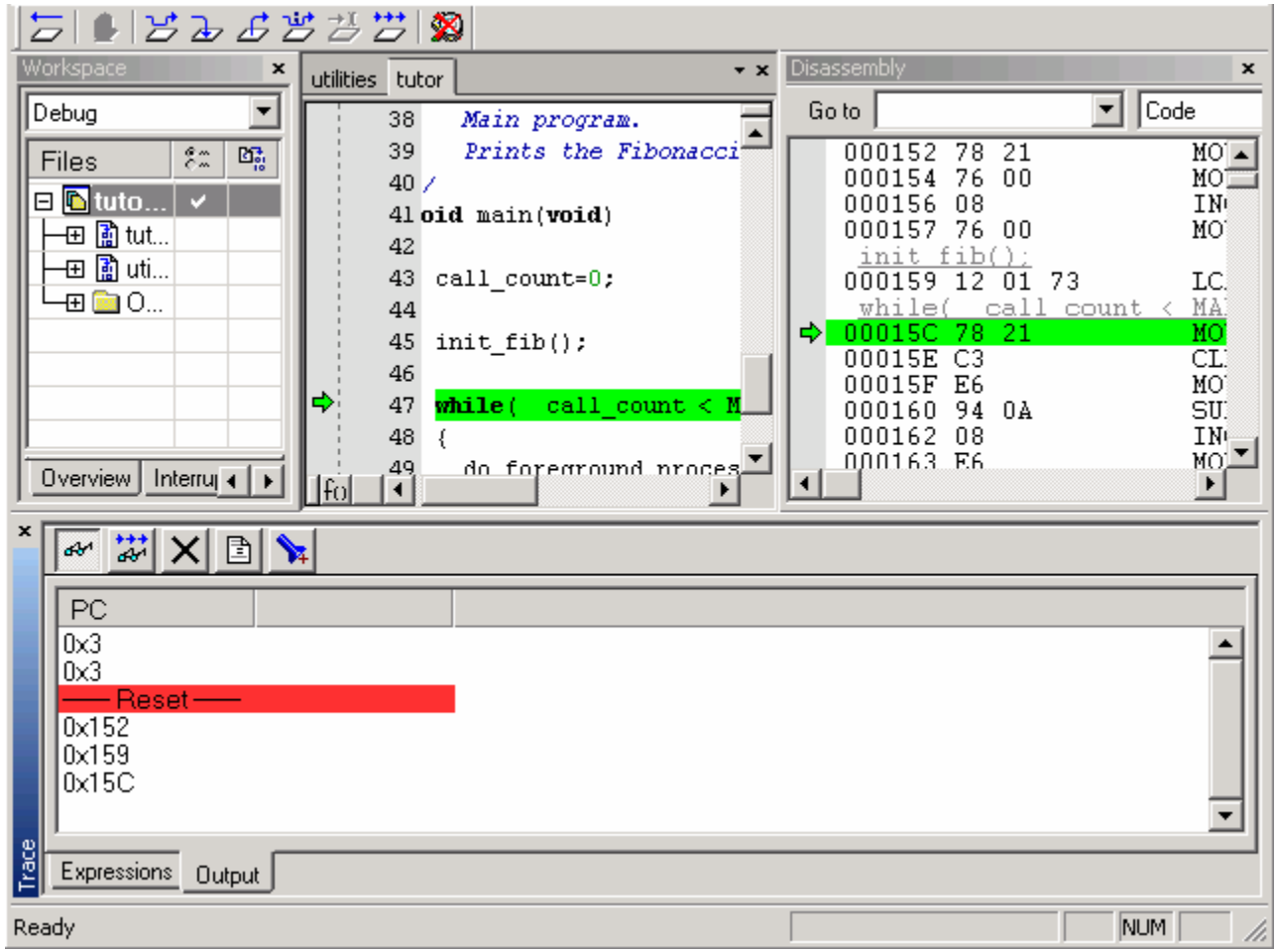

Trace: Value of particular variable 9

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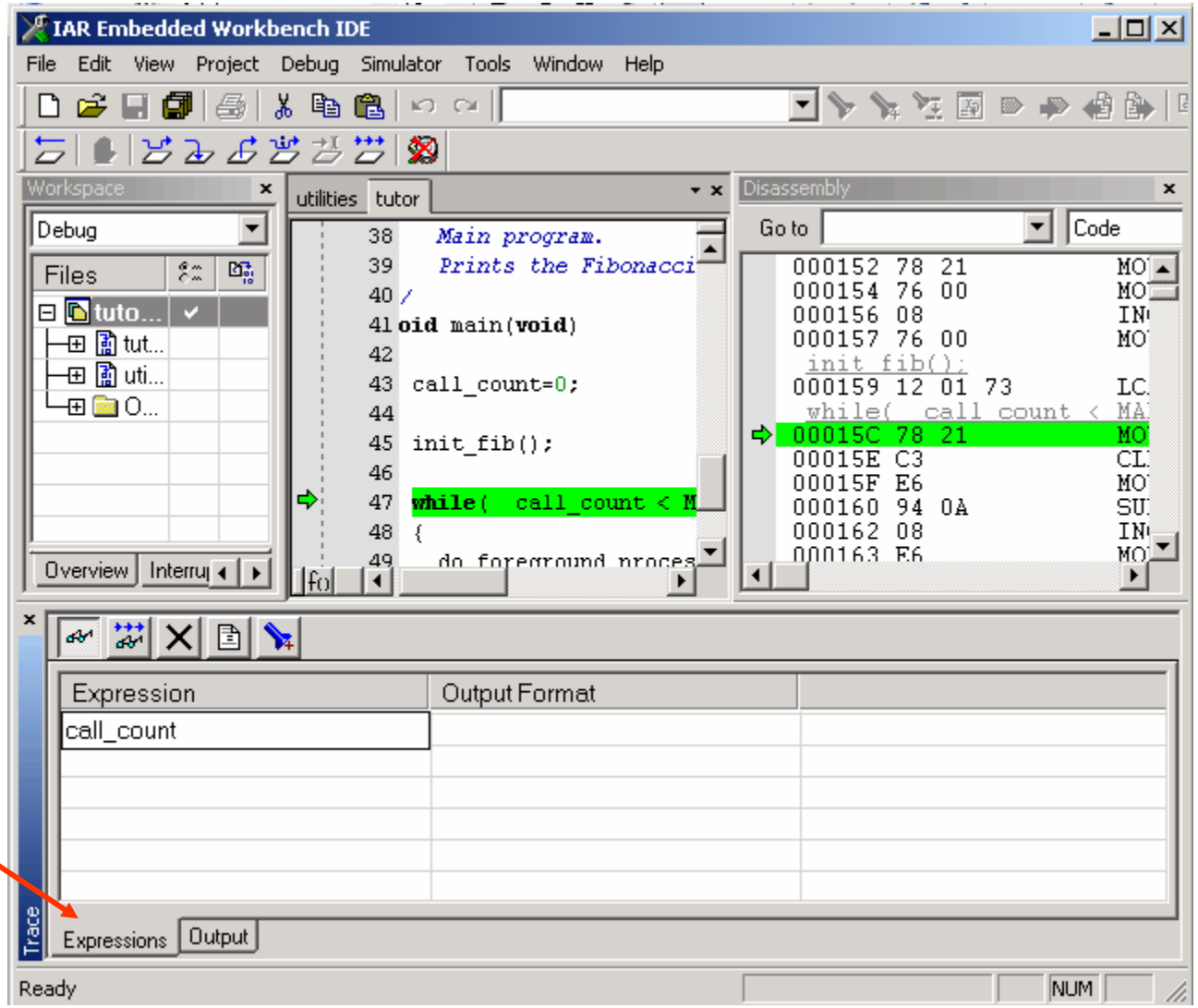
Select expression tab



Trace: Value of particular variable 10

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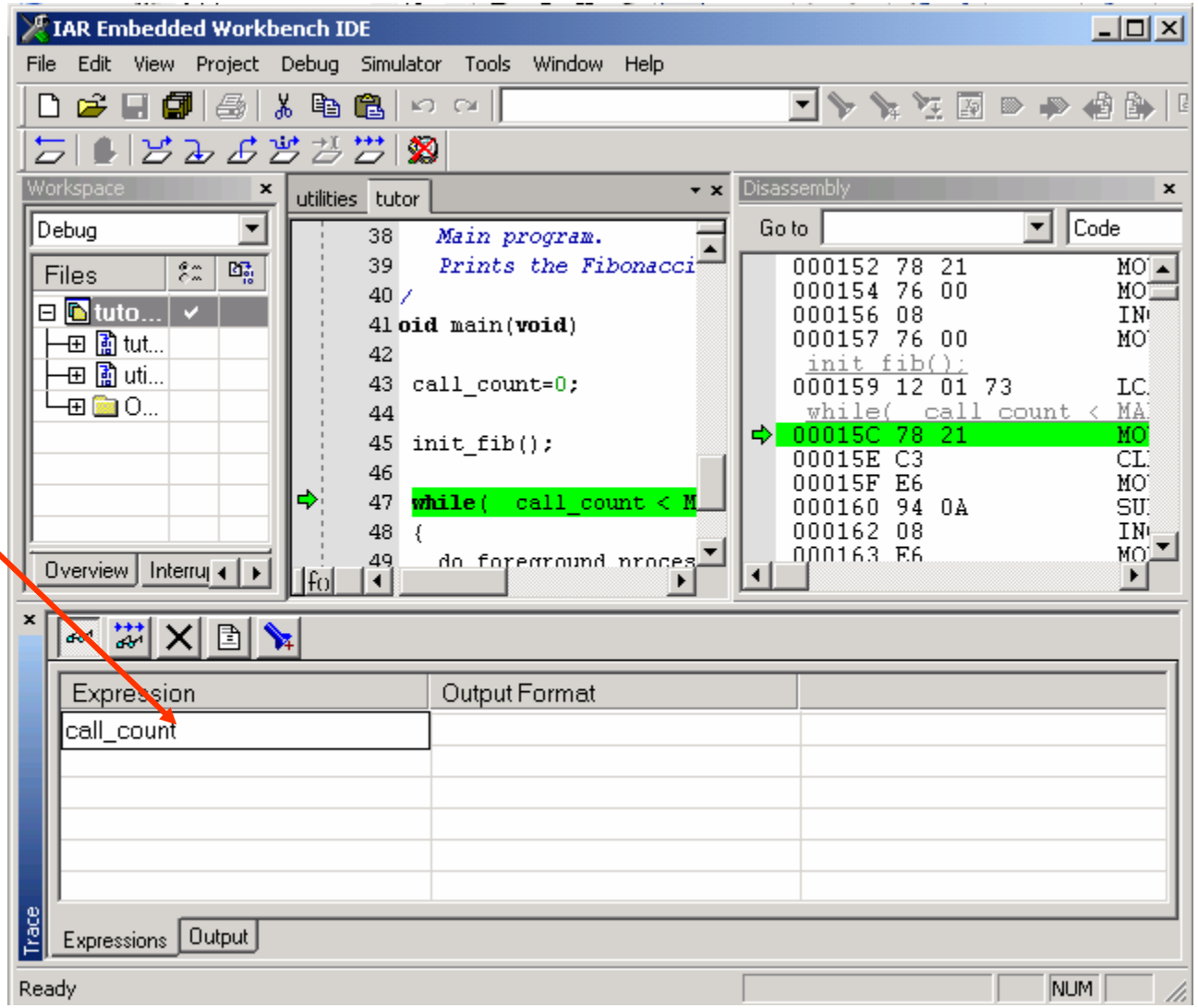
Enter variable



Trace: Value of particular variable 11

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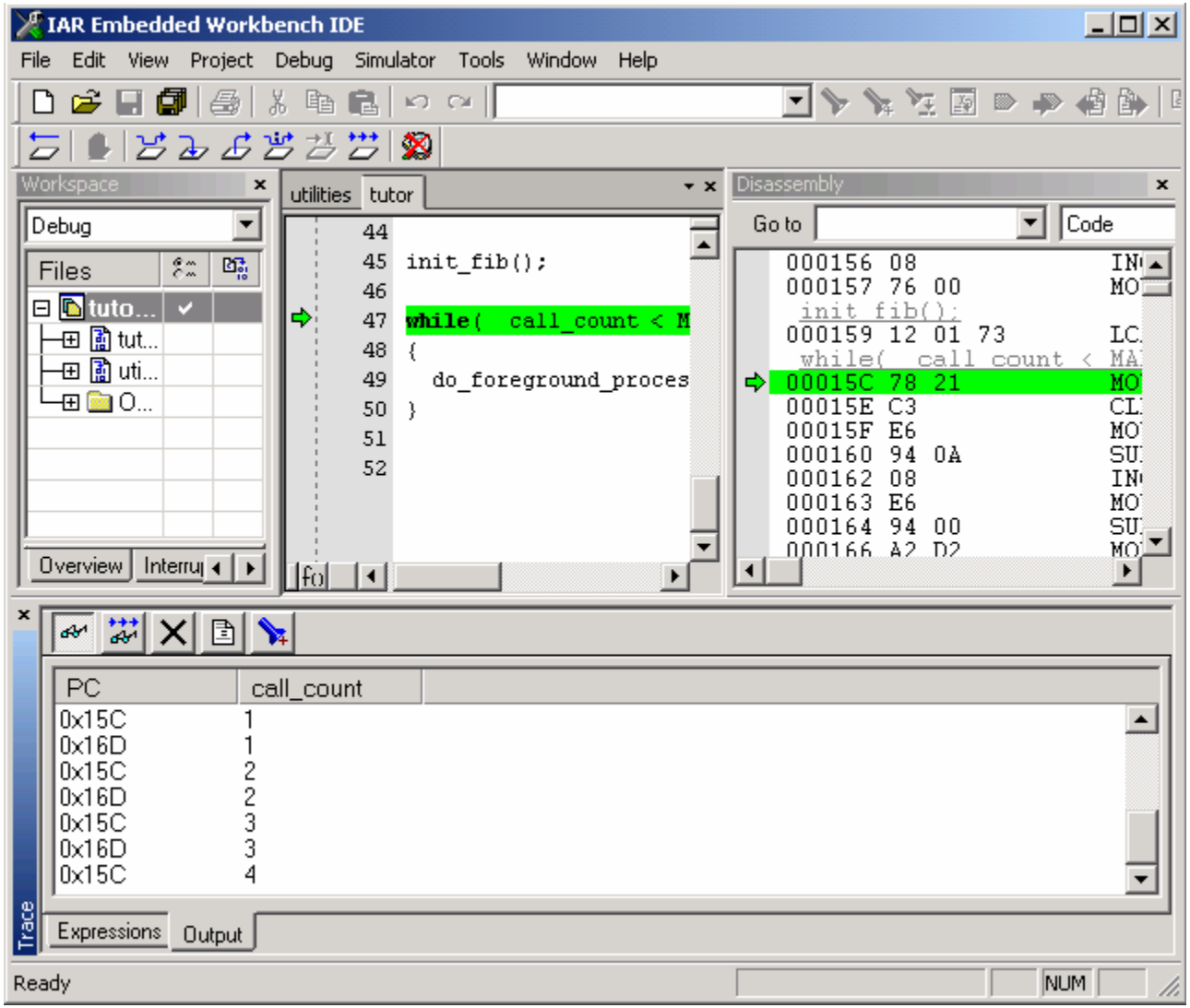

Code Coverage

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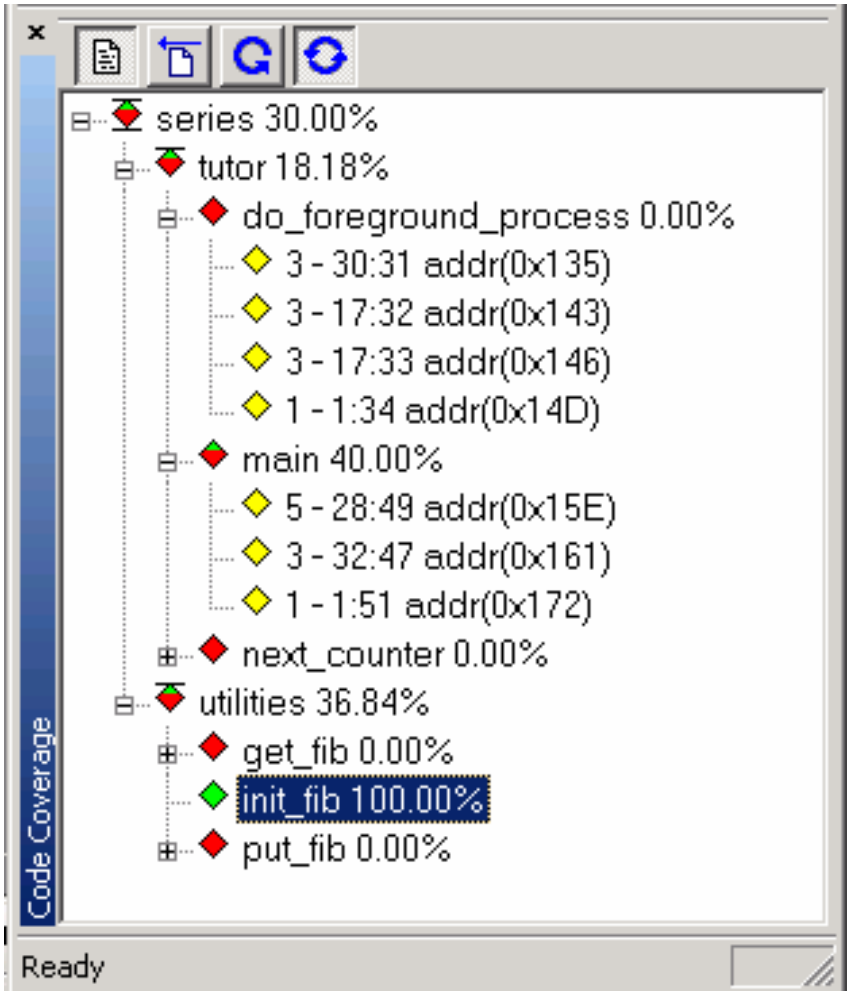
Shows which part of the code is executed



Code Coverage 1/9

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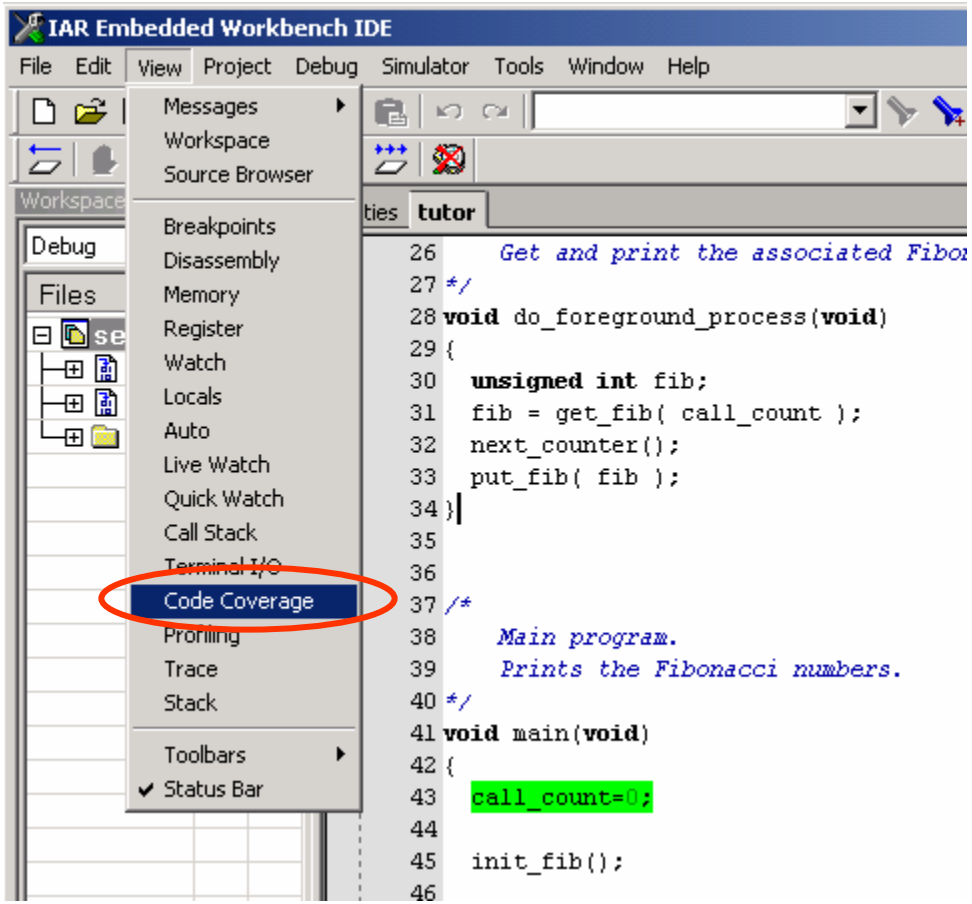
To open Code Coverage window



Code Coverage 2/9

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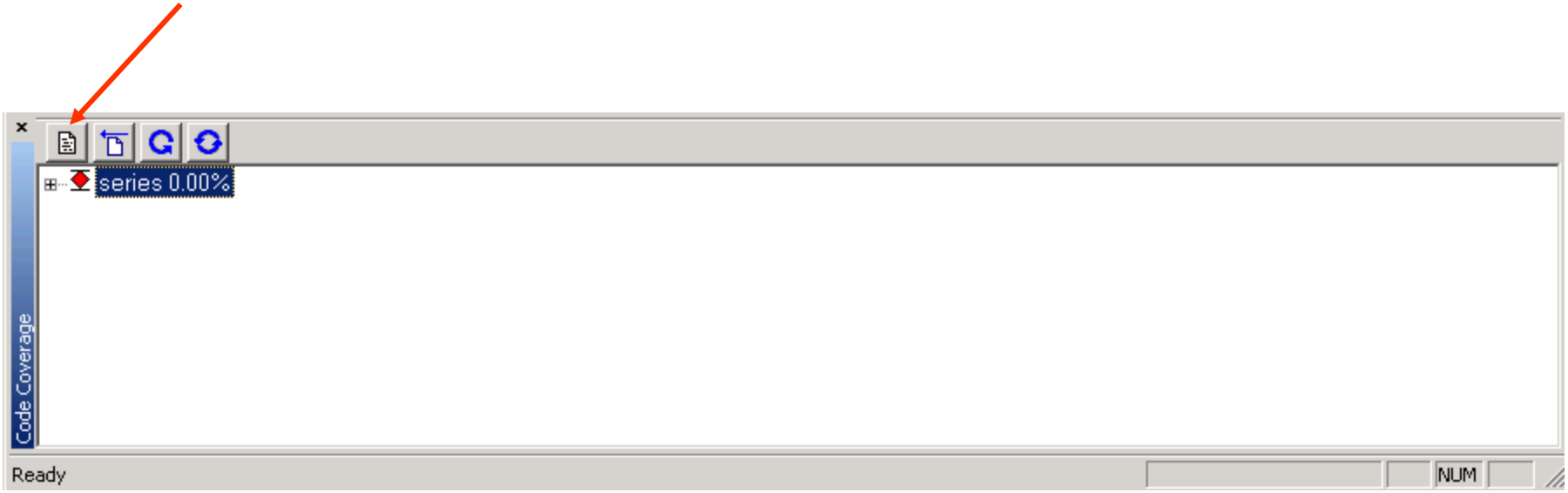
Steps to start code coverage

1. Active window



Code Coverage 2/9

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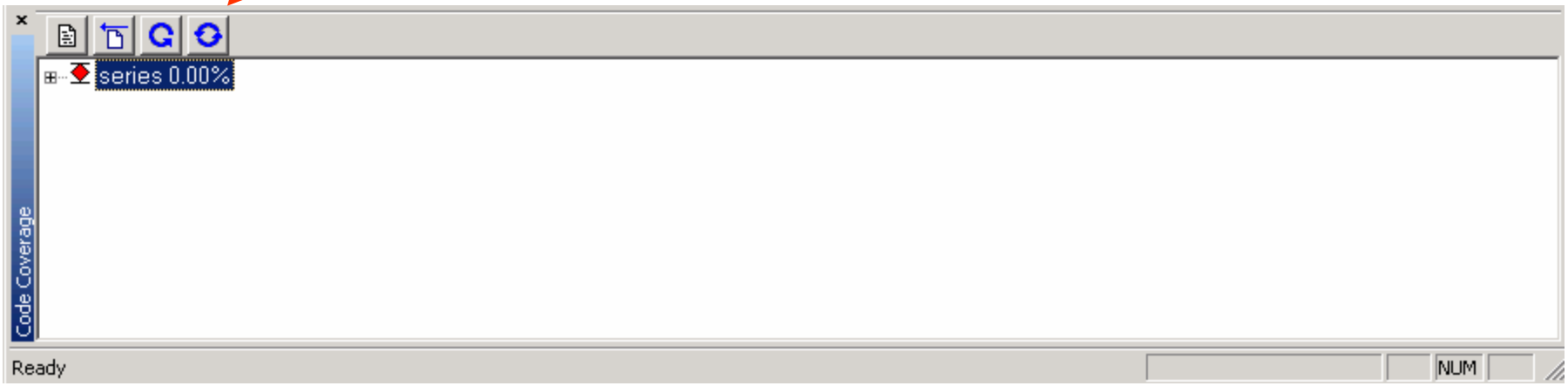
Steps to start code coverage

2. Auto fresh



Code Coverage 3/9

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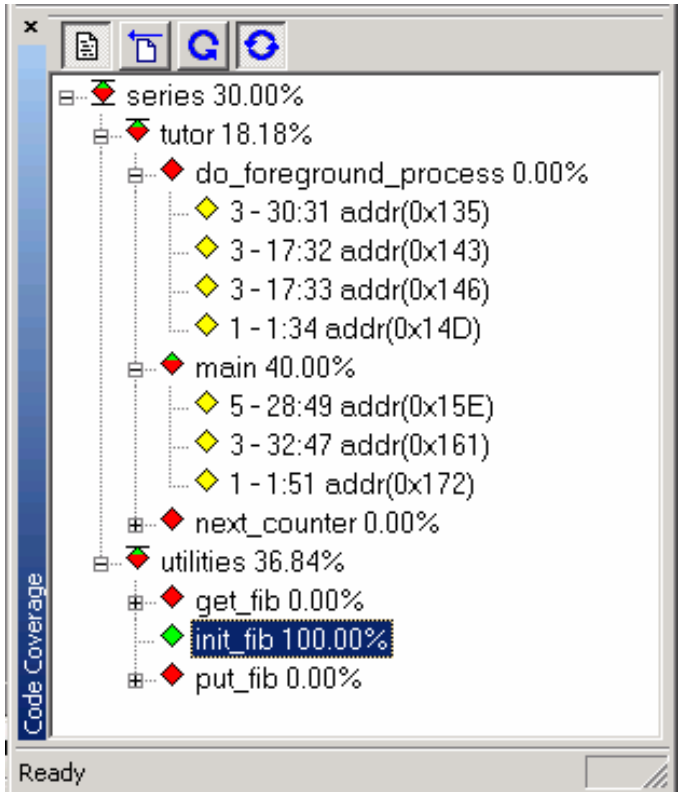
To see code coverage execute the code step by step or execute completely



Code Coverage 4/9

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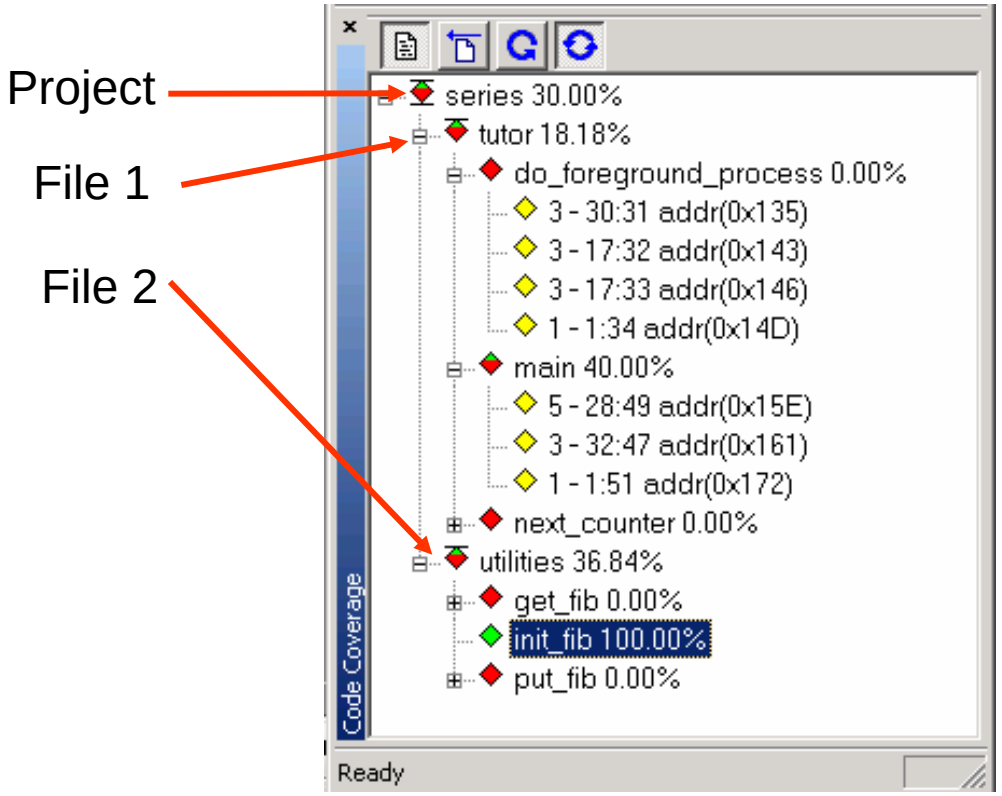
Details displayed in code coverage window



Code Coverage 5/9

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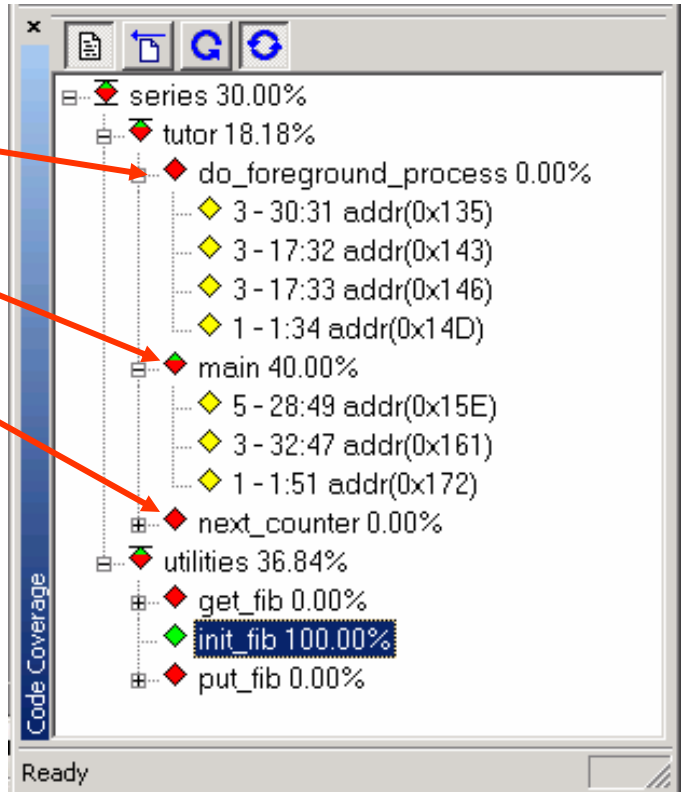
Details displayed in code coverage window

Function of file



Code Coverage 6/9

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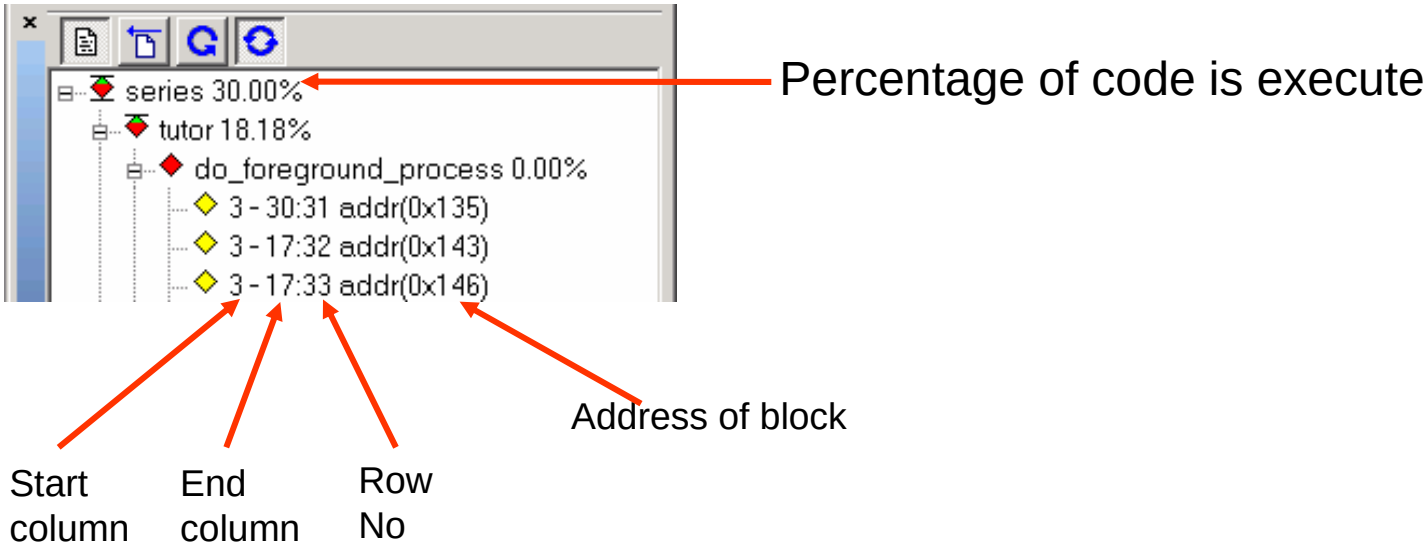
Details displayed in code coverage window



Code Coverage 7/9

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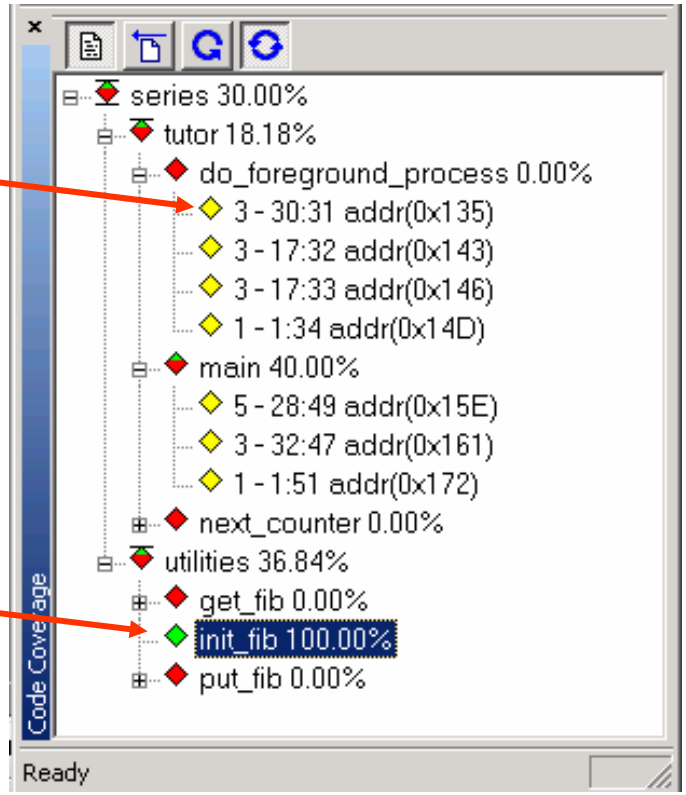
Color Scheme

Code which to be execute

Function executed completely



Code Coverage 8/9

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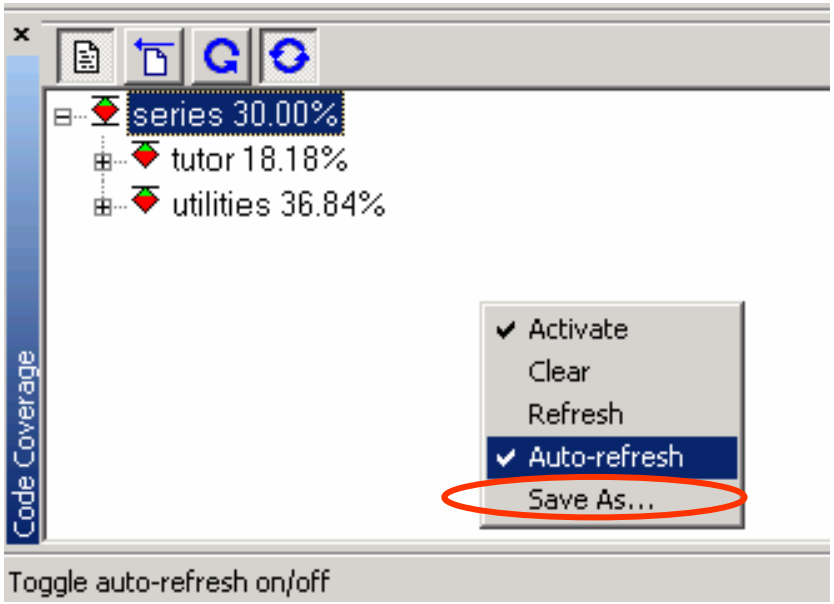
To generate a report right click in the window



Code Coverage 9/9

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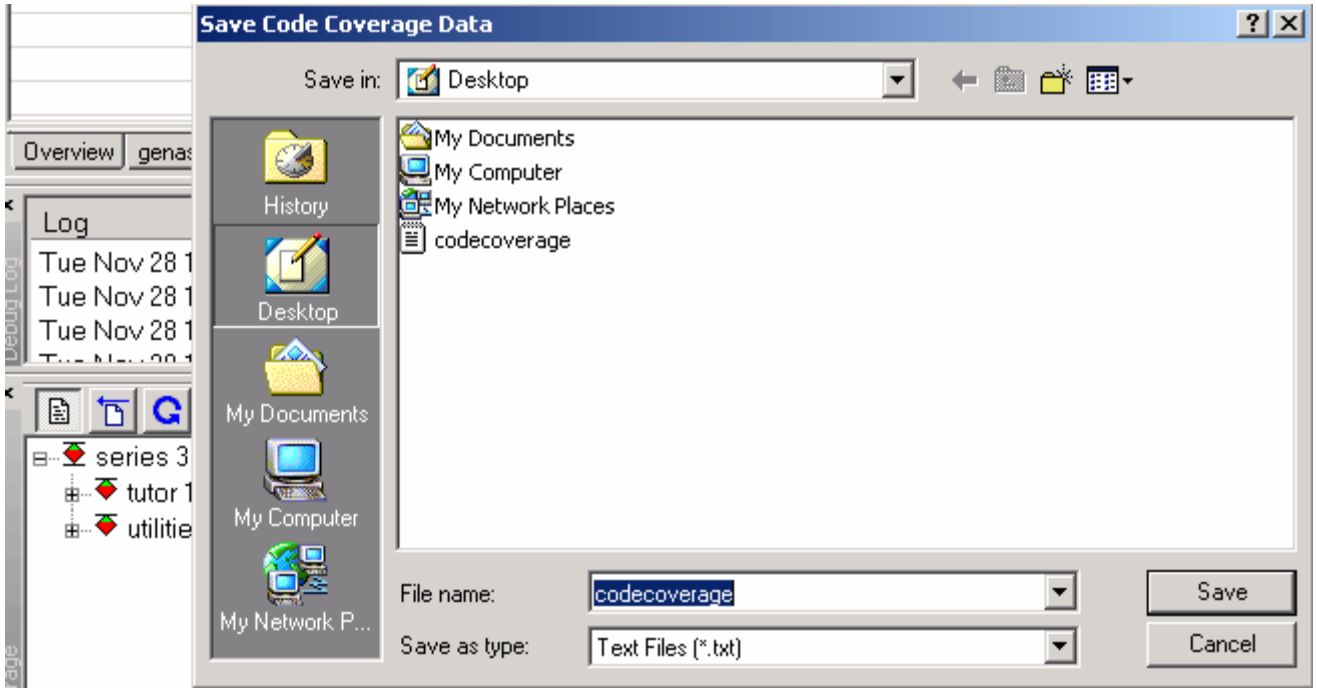
Save the file (file is in the text format)



http://www.embeddedcraft.org