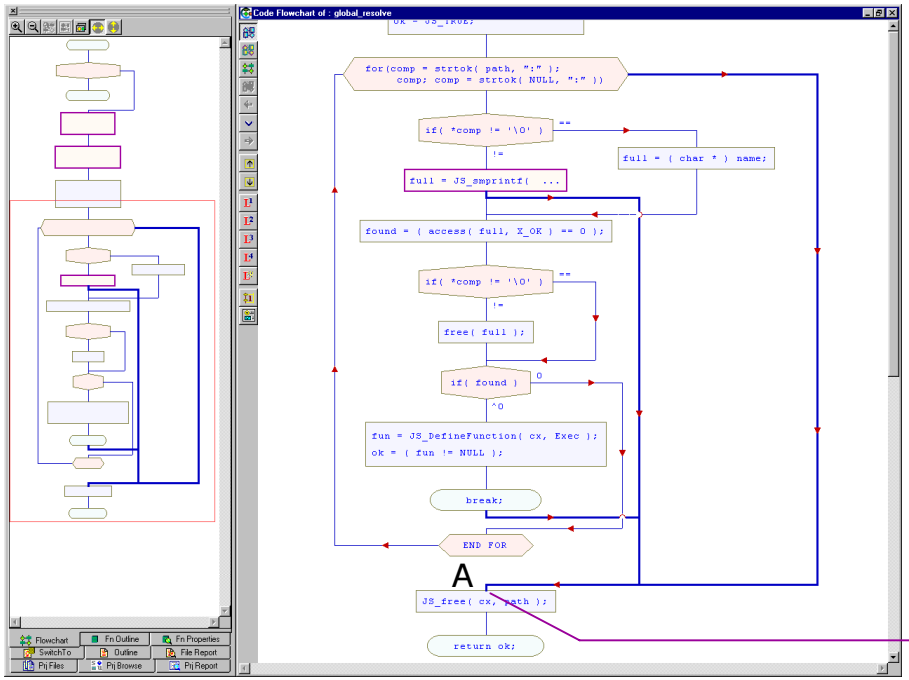
Understand Any Function in less time



← With the flowchart, you can understand this 50-line function in half the time.

How do you find all paths that go to point A in the function?

Answer:

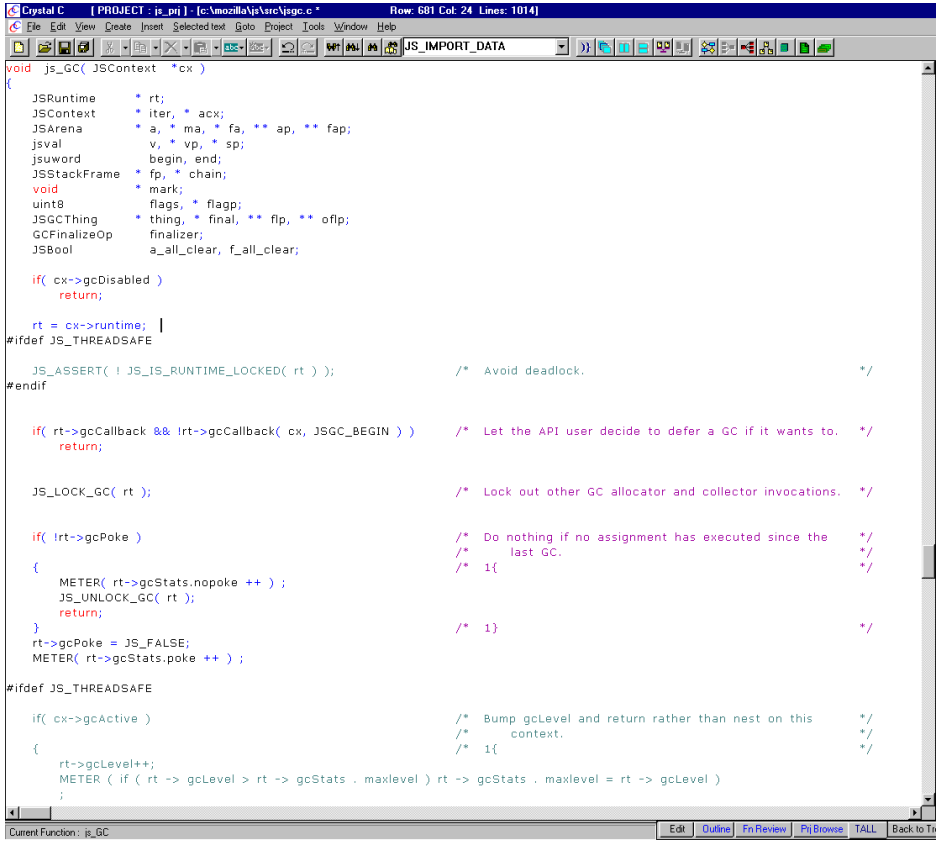
Click on point A in the flowchart.

Crystal C/C++ automatically creates the flowchart of any function.

If you do not have flowcharts,

- how do you find all such paths?
- or examine them during code-review?

How to Attack a Very Long Function



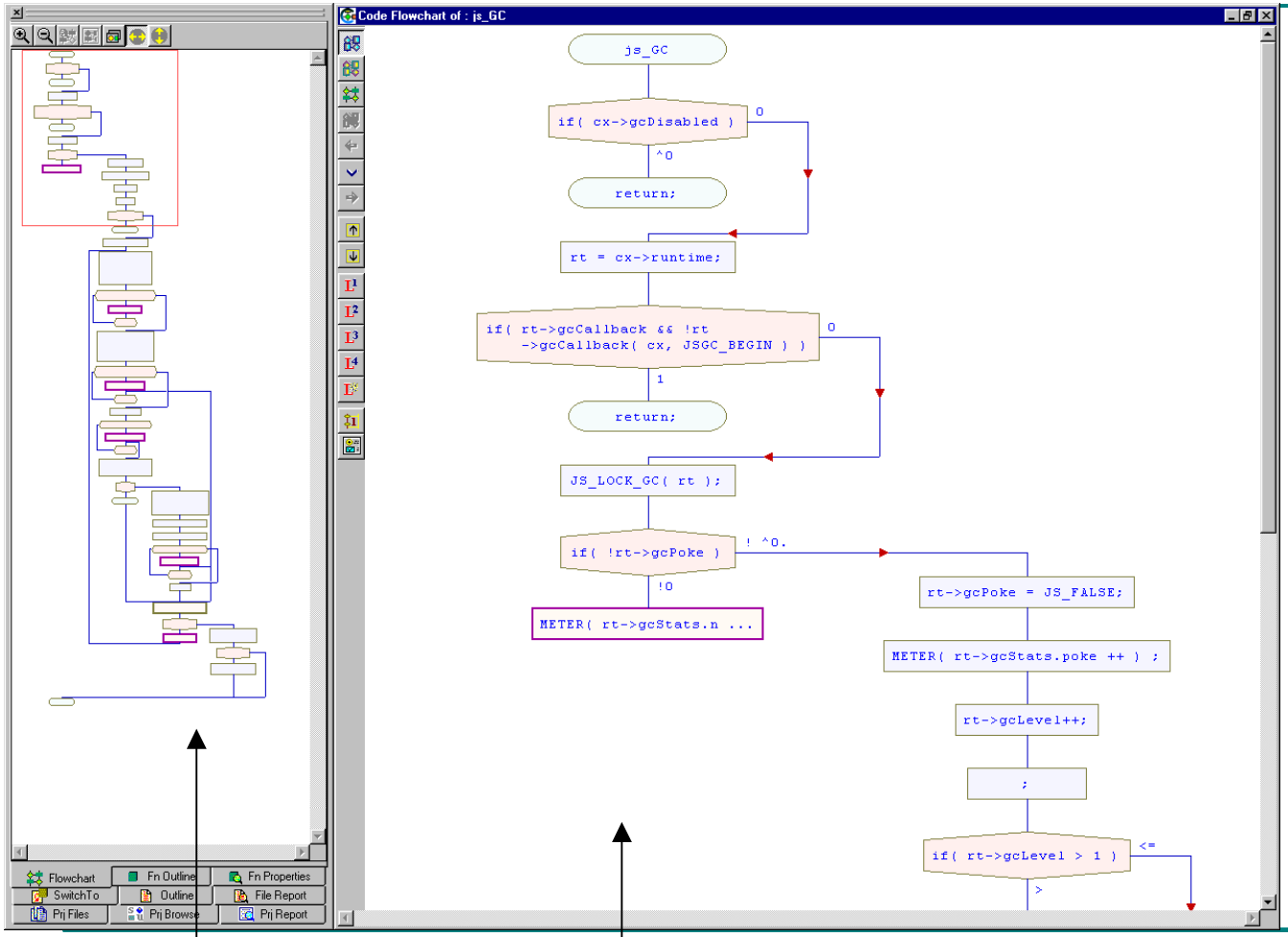
← This is js_GC , a 350-line function from Mozilla source code. (seven pages of your window)

How would you review and understand this function's code?

Answer: Click the flowchart icon  .

Understand the Top-Level Logic

in less than 5 minutes



Condensed View

Detailed View

For large functions, Crystal C/C++ automatically creates a top-level flowchart.

← Top-level flowchart of the function js_GC.

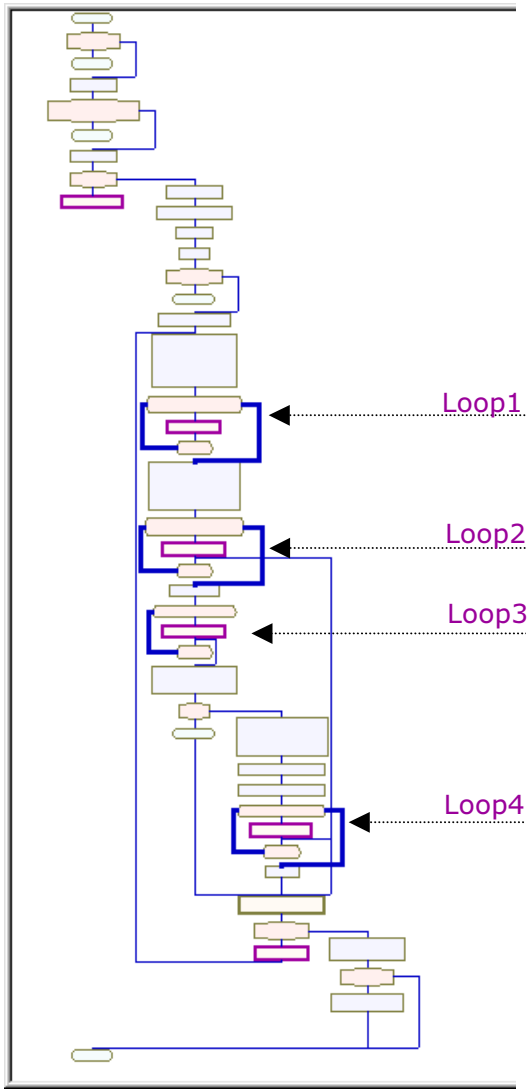
You will need less than five minutes to go through this flowchart.

If you do not have flowcharts, how do you construct the top-level view of a long function***?***

Divide and Conquer:

You just viewed the top-level flowchart;

Next: Flowcharts of the Inner Parts.



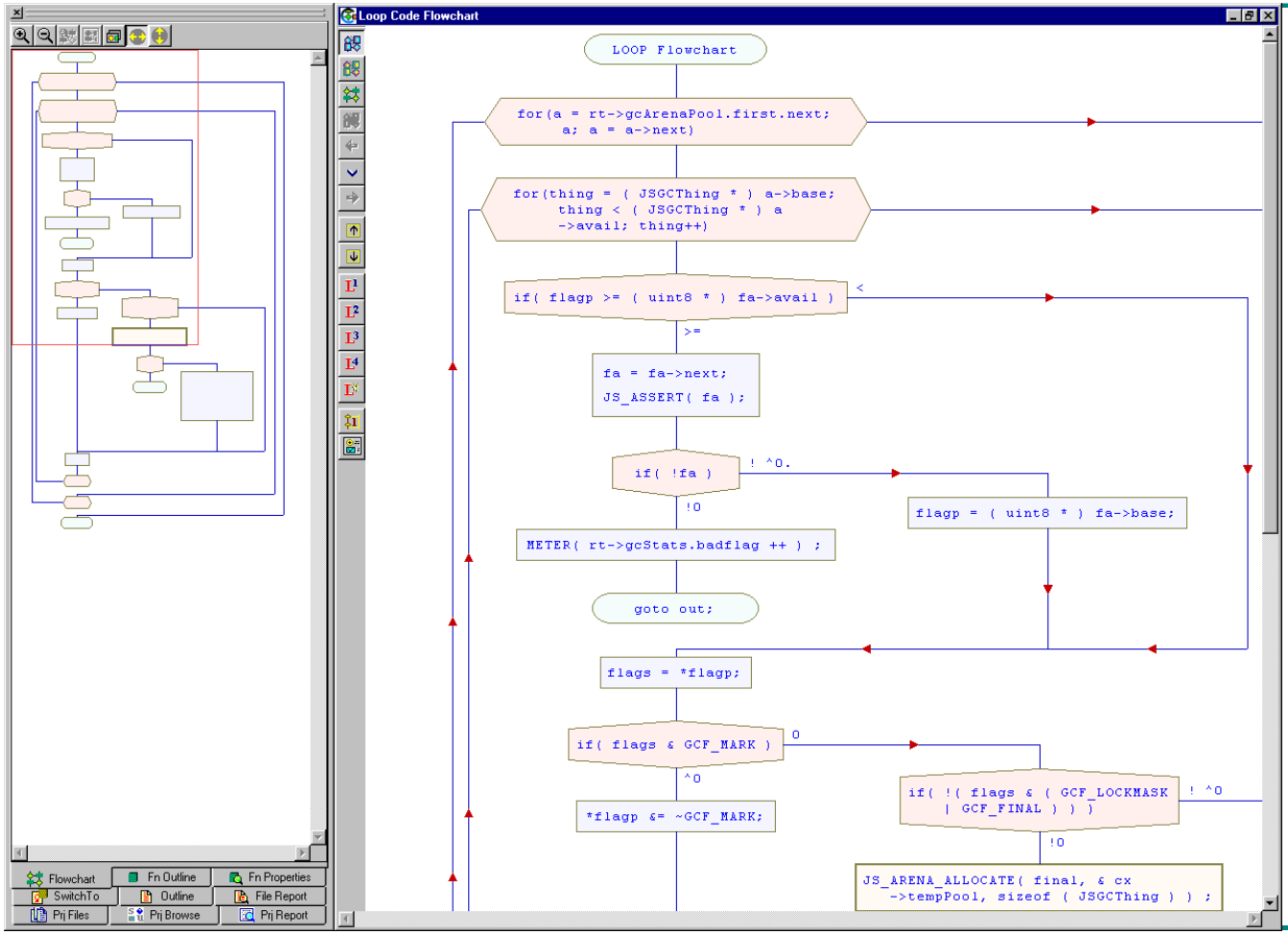
Click on a loop or switch symbol to create its flowchart.

← The Major Loops in js_GC

A purple outline ▭ indicates a high-level symbol.

It hides the internal details of a loop, switch etc.

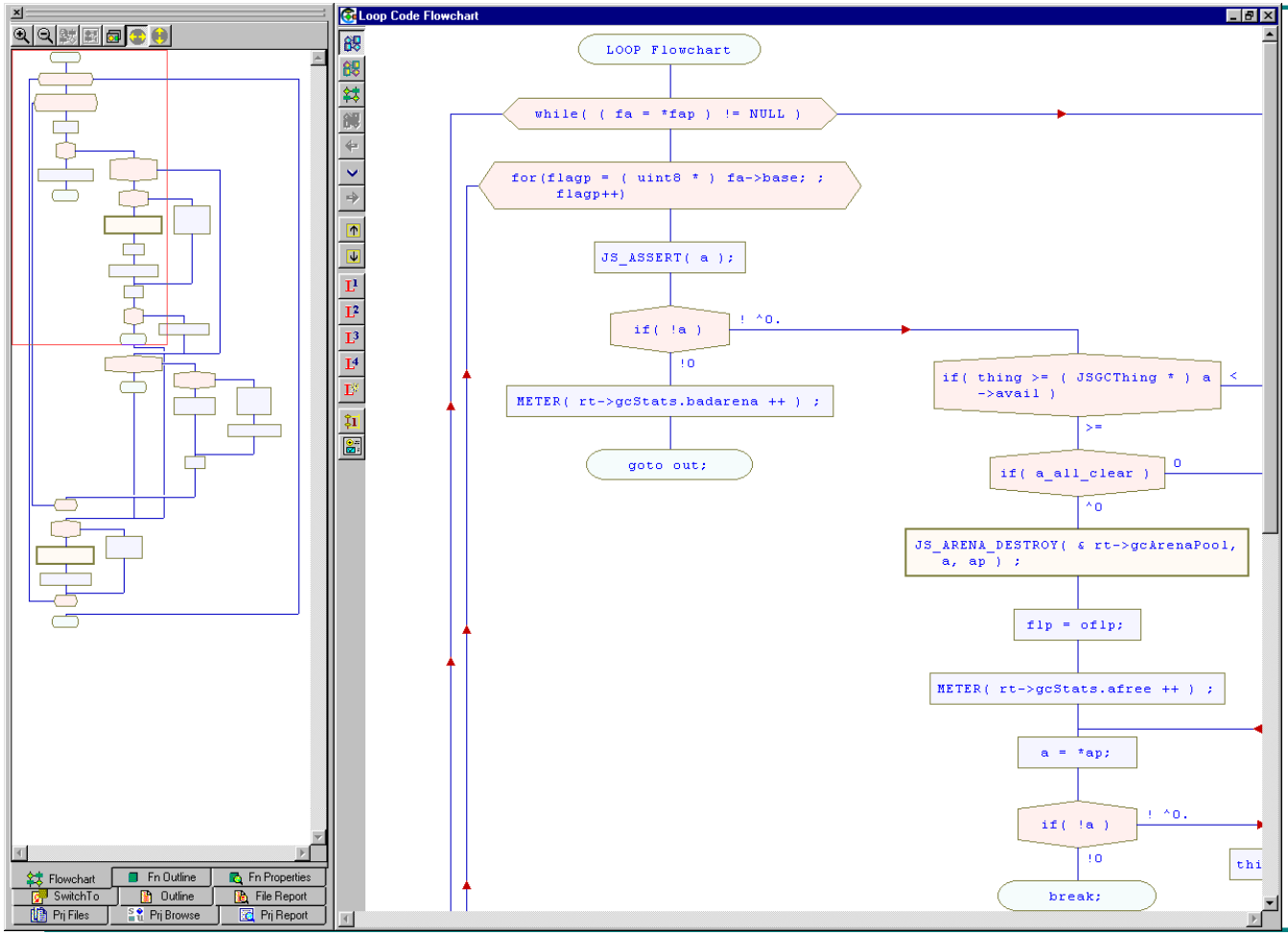
The 1st Major Loop in js_GC



← Flowchart of 1st major loop in js_GC

You will need just two minutes to understand this loop.

The Next Major Loop in js_GC



You will need
less than five minutes
to understand this loop.

The graphical view is
easy to understand and
easy to recall.

As we saw above, in about twenty minutes, you can clearly understand a 350-line function.

Without the flowcharts, it will take more than one hour.

Flowcharts are Valuable in many situations

1. after designing or modifying code – view the whole function;
   make sure all conditions are covered.

2. during code-reviews, the whole team saves a lot of time

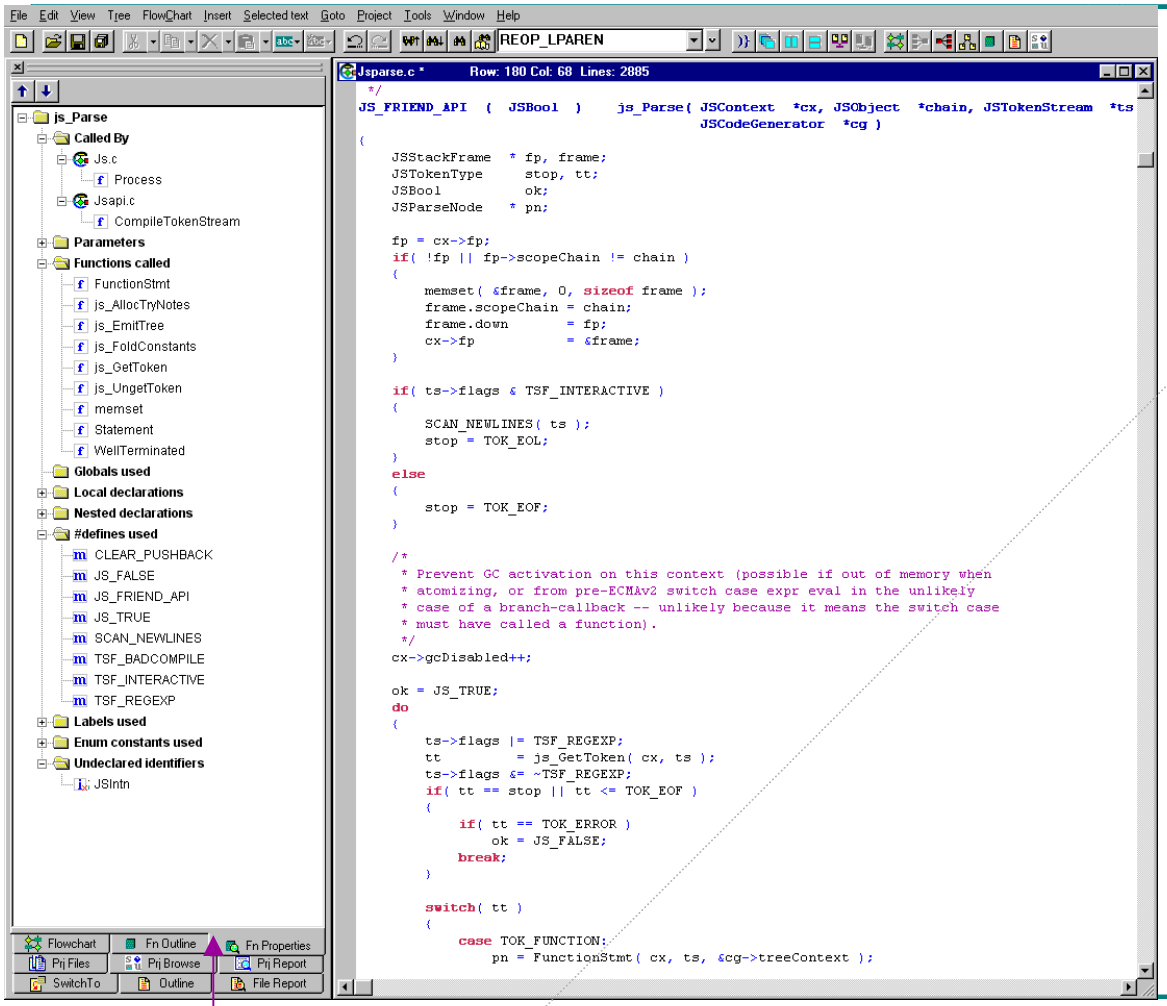
3. during integration testing, you can easily undertand other team members' code.

4. when you inherit legacy code.

5. when you are a new member of the team.

You can export a flowchart as a .bmp or .jpg file for documentation.

Function Properties - Called By, Functions Called, Globals Used etc.



- Place the cursor in a function.

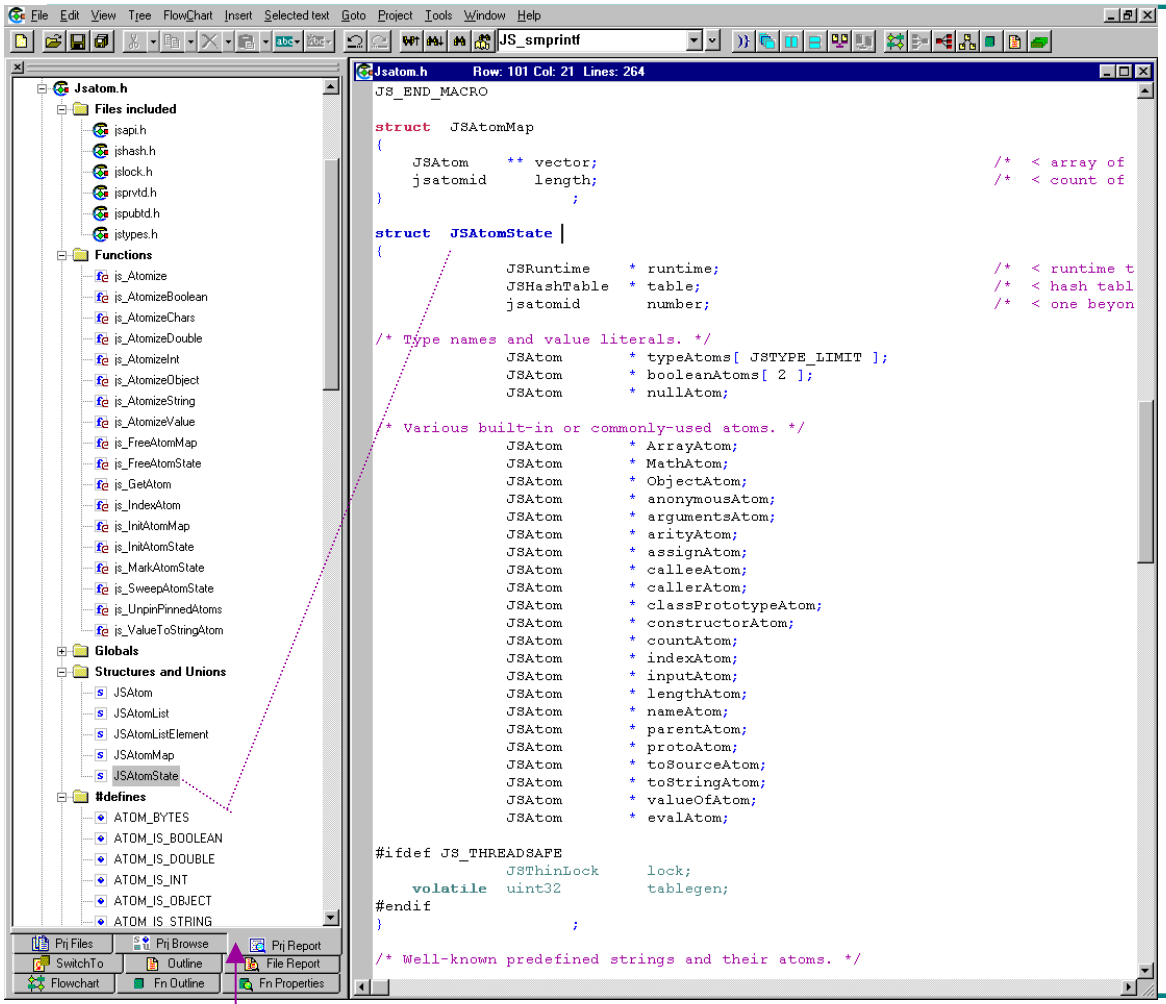
  Click the "Fn Properties" tab in the browse-window.

- Double-click on a node.

  Also, try right-click on a node.

Overview of Globals, Functions, Structs etc.

from each Source File



Project Report

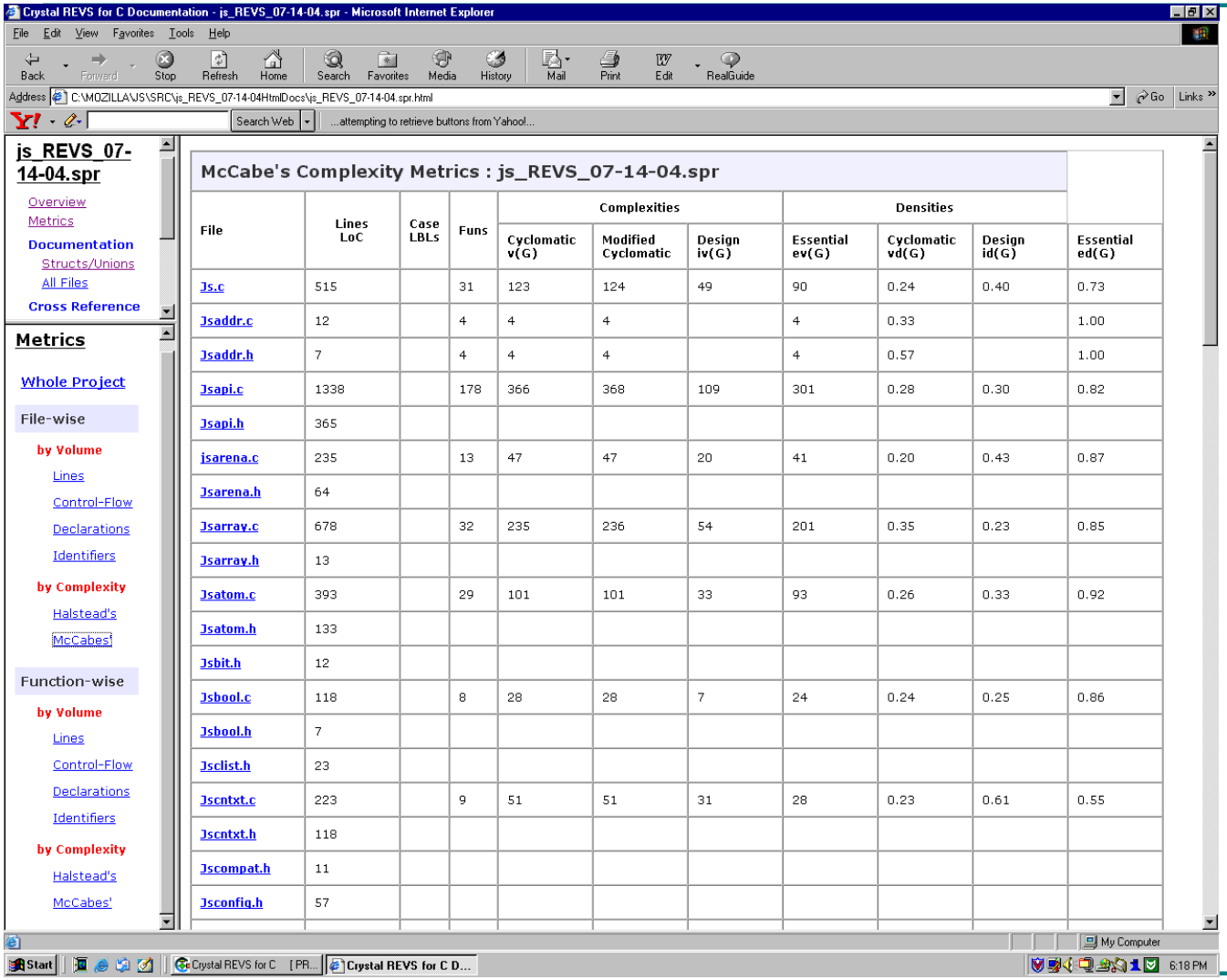
Get an overview of source files:

- a file-by-file report of all the globals in the project;
- all the functions in the project,
- all the structs in the project, etc.

To go to the definition of a global or a function :

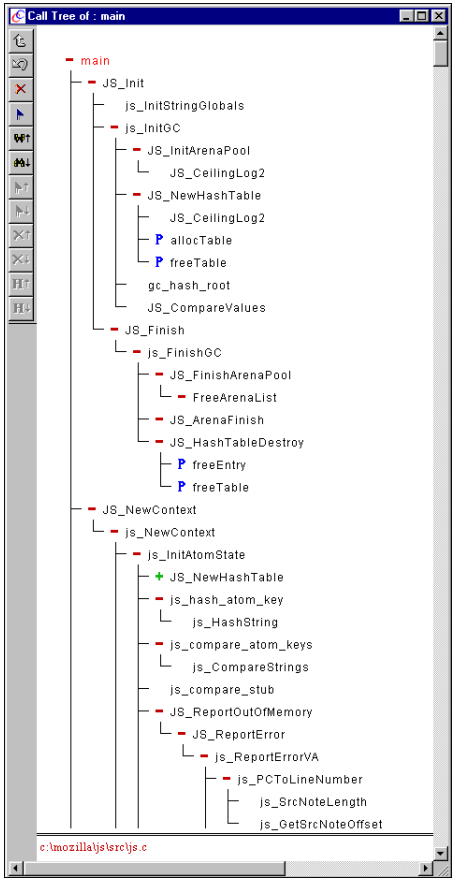
double-click on an entry in the overview report.

Software Metrics

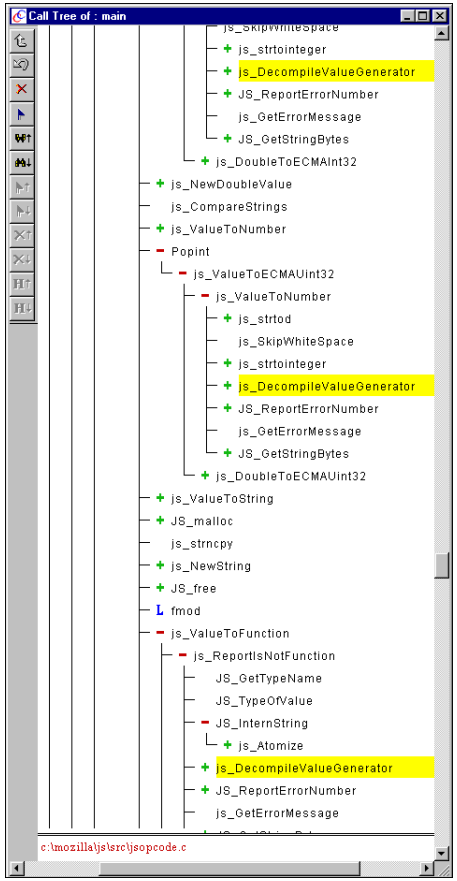


You can also create javadoc-like HTML Reports.

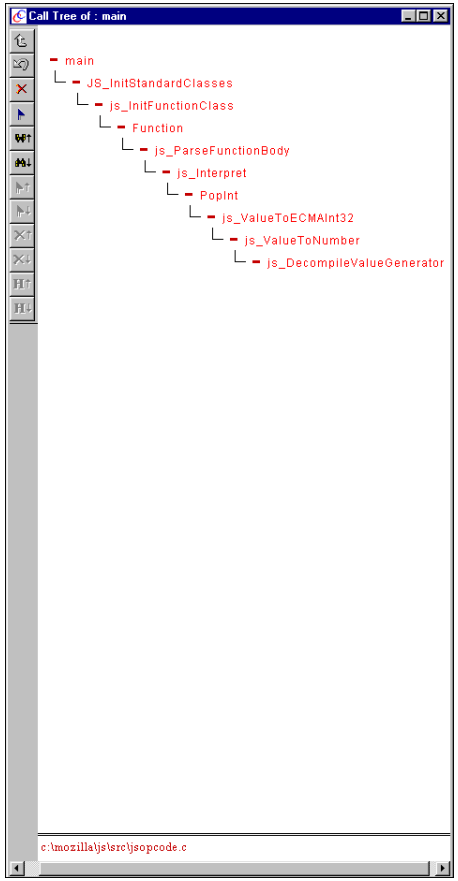
Call-Trees, Caller-Trees, File-Trees



1. Call Tree of main()



2. The result of a node-search for js_DecompileValueGenerator() in the tree.



3. **View just the call-path:** Crystal C hides all nodes except those in the call-path of js_DecompileValueGenerator()

If you are not using Crystal C/C++,

you are spending a lot more time than you need to.

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