

Re: How to write a program to track the value of a certain variable at run-time using debug features???

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- *From:* "classicalmania" <trungthanh78@xxxxxxxxxx>
 - *Date:* 19 Mar 2007 07:52:05 -0700
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On 19 Mar, 18:38, Ulrich Eckhardt <dooms...@xxxxxxxxxx> wrote:

Uli

Dear Ulrich,

Thank you for your quick helps. Firstly, apologies for my possibly off-topic topic, but I think that possibly there might be some Linux-based debug tools for my purpose.

However, the problem is that my program will NOT KNOW which function to be provided by the users and which/ how many parameters (defined as global variables) the function may take

Give me an example how your program is supposed to behave in action. IOW, what is the user-input and what is the program output? Collecting use-cases is a good start for defining the behaviour in general.

Secondly, I am afraid that my first post does not properly show what I would like to ask (sorry about that). Actually as a part of my research I have written an algorithm to solve numerical functions. The algorithm will be integrated by users with the code of their numerical functions so that their program can solve the functions.

In other word, my algorithm will treat users' numerical functions as black boxes. It will solve them no matter what is the content of these functions provided that they conform to the format $y=f(\text{vector } x)$.

However, there is a problem: the functions of users may change

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dynamically over time (for example, they may change from $y=x+y$ to $y=x+2y$, as shown in the previous post). My algorithm needs to track this change without knowing anything about user source code. That's why I am thinking about using Linux debug features.

I think that one solution for the problem might be:

1. List all global variables currently used in the program
2. Find out which global variables are being used by f (I can do that by parsing the source code file of f)
3. Tracking the value of all these global variables to see whether they have been changed outside of f or not. If they have, then possibly that f has been changed too.

This is possible, but very complicated in C because it is a statically compiled language. If you want the user to enter code that is to be executed, you might want to take a look at dynamic languages like Python instead. If you want to stay with C, you need to learn about the ELF binary format (which is used by Linux) and you need to learn about memory protection methods in order to track accesses to variables.

As mentioned above, I do not want users to enter code dynamically. Instead users will integrate my algorithm with their source code and compile it, and I need to track how many variables they are using and whether their variables have changed or not.

Do you have any idea about this issue?

Thank you very much and again sorry for my slightly off-topic question.

Best regards,

Thanh.

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