Debugging Programs with DDD

Project #5

Computational Physics Lab

[Due by February *7, 2008 at the end of class*]

Often scientific programming projects benefit from a joint development effort by a collaborative group. One way to distribute and maintain the development source code is through software repository utility programs. The C*oncurrent Versions System*, cvs, is a popular and an open source version control system. In this exercise, we will use cvs to retrieve the source code for a program which intends to calculate the sum of powers of positive integers:

$$\sum_{x=1}^{n} x^p = 1^p + 2^p + 3^p + \ldots + n^p$$

Before using cvs, you will need to set the CVSROOT environmental variable. From the Linux shell execute "setenv CVSROOT /export/home/crede/comphy/cvs/". Note that every time you open a new terminal window you will need to set this environmental variable. Alternatively, you could modify your *.cshrc* file to include this command. Now go or create a directory where you want to work on this exercise, and check out the cvs package *debug* via the command "cvs checkout debug". You should now have a directory called *debug* with several src files. Use *make* to build the program *mysum* via "make mysum". Use an editor to modify the file named *Makefile* so that it now includes the debug option when building the program *mysum*. Now execute "make clean" (see the *Makefile* on what this does) and then execute "make mysum" again.

Modify the src code to fix any compiler warnings. Now execute the program via "./mysum <integer> <power>" where <integer> and <power> are integer values. For example: "./mysum 2 3" should return the sum of $1^3 + 2^3$.

Note there are several bugs in the code to fix. Use the *ddd* debugger to debug your *mysum* program. Some bugs cause the program to crash (segmentation fault) whereas others cause faulty results.

In addition, **format and comment the source code to our conventions.**

Post the exercise to your computational physics website. Create an html page for Project 5. Create a link from your main project web page to this html page. This html page should include the following heading information: exercise title, exercise number, your name, & today's date. The main content of this page should include the following:

- a short description of the exercise with a list of bugs corrected
- links to your final source code files
- a text region*** which contains the actual source code text
- a text region with the program outputs

***For text regions use the html object tag; example:
  <object width="600" height="400" type="text/plain" data="ex1_part2.cc" border="0" ></object>