

**CS69003: Computing Systems Lab I**  
**Autumn 2008**

**Assignment 4**

**Implementation of a simple shell using fork() and exec()**

**Due: August 29, 2008 (Friday)**

Write a C program to act as a command interpreter (shell). The shell will give a prompt for the user to type in a standard UNIX command, take the command, execute it, and then give the prompt back for the next command (that is, actually give the functionality of a shell). Your program should do the following:

For every command provided by the user, your program must fork a new child process and let the child process handle that command. When the child program finishes execution of the command, control comes back to the parent process and the user is allowed to enter the next command.

**Part I** **(30)**

First, implement single-word commands like “ls”, “wc”.

**Part II** **(40)**

Allow the user commands to take arguments, such as “ls -lF”, “wc myfile.txt” and “cc myprog.c -lm -o myprog -O2”.

**Part III** **(30)**

Handle the input redirection operator < and the output redirection operator > in the user’s commands. For example, “./a.out < userinputs.txt > output.txt” reads the input from the file “userinputs.txt” (instead of the standard input) and writes the output to the file “output.txt” (instead of to the standard output).

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You are required to submit a single C file with the name <your\_roll\_no>-assgn4.c solving all the parts of this assignment. Write three separate functions for the three parts.