

CSC 521 Operating Systems

Project 1 – A MyShell Program

Due February March 8, 2024, 6:30pm

The Shell or Command Line Interpreter is the fundamental User interface to an Operating System. This project is to write a simple shell that has the following properties:

1. The shell must support the following internal commands:
 - i. `mycd <directory>` - change the current default directory to `<directory>`. If the `<directory>` argument is not present, report the current directory. If the directory does not exist an appropriate error should be reported. This command should also change the `PWD` environment variable.
 - ii. `myclr` - clear the screen.
 - iii. `mydir <directory>` - list the contents of directory `<directory>`.
 - iv. `myenviron` - list all the environment strings.
 - v. `myecho <comment>` - display `<comment>` on the display followed by a new line (multiple spaces/tabs may be reduced to a single space).
 - vi. `myhelp` - display the user manual using the `more` filter.
 - vii. `mypause` - pause operation of the shell until 'Enter' is pressed.
 - viii. `myquit` - quit the shell.
 - ix. The shell environment should contain `shell=<pathname>/myshell` where `<pathname>/myshell` is the full path for the shell.
2. All other command line input is interpreted as program invocation which should be done by the shell `forking` and `execing` the program as its own child process. The programs should be executed with an environment that contains the entry: `parent=<pathname>/myshell` where `<pathname>/myshell` is as described in (ix.) above.
3. `readme` is a user manual describing how to use your shell. It should contain enough detail for a beginner to UNIX to use it. For an example of the sort of depth and type of description required, you should have a look at the on-line manual for `bash/tcsh`. This shell obviously has much more functionality than yours and thus, your manual doesn't have to be quite so large.
4. The command line prompt must contain the pathname of the current directory.

Programming Language and Environment:

- Language: C language
- Platform: MCT263 Machines (on Sloop/Clipper, ssh userid@mct263s14.cs.ship.edu)
- Shell: tcsh

Submission:

Make the followings as `s24csc521p1_lastname.tar.gz` and then submit it to ship.drlee@gmail.com. The subject of your email is `s24 csc521 p1 lastname`.

- makefile
- readme
- manual
 - description of operation and commands
 - description of environment concepts
 - overall layout and display of understanding
- source code (myshell.c, etc.)
- any extra files needed to run your shell program
- typescript
- documentation
 - description of the program
 - algorithm
 - analysis of your algorithm and output
 - performance description

Marking Criteria (80 marks total):

- Submission of required files only, with the information of student, instructor, and course on all submitted files (5 marks)
- Warning free compilation and linking of executable with proper name (5 marks)
- Support for keyboard (5 marks)
- Performance of internal commands and aliases (30 marks)
- External command functionality (10 marks)
- Readability, suitability & maintainability of source code and makefile (5 marks)
- Manual and documentation (20 marks)