

Assignment 3

Shell Implementation

NOT FOR PG1 VLSI STUDENTS

Objectives:

1. Understand the working of command line interface in Unix-like environment,
2. Understand the process forking mechanism.

You need to take the input from the command line in an infinite loop till an “exit” is entered and the corresponding output should be printed to stdout. Also, give a name to your shell which will be visible before the prompt.

Ex:

Shell name: Avengers

bash prompt:~\$./shell

Avengers:/home/hulk\$ ls
shell.cpp shell

Avengers:/home/hulk\$ fdre
Avengers: fdre: No command found

Avengers:/home/hulk\$ exit
Bye...

bash prompt:~\$

Required Functionalities:

1. Execute all the commands (ls, clear, vi etc.)
2. cd, pwd, export
3. Set environment variables stored in configuration file “.shellrc”
4. Print environment variables using echo command
5. Redirection operators < , > , << , >>
6. Support for history and '!' operator
7. Pipes “|” (multiple)
8. Background and foreground functionality : &, fg

Useful Functions:

- `int chdir(const char *path)`
- `int execvp(const char *file, char *const argv[])`
- `void exit(int status)`
- `pid_t fork(void)`
- `char *getcwd(char *buf, size_t size)`
- `char *getenv(const char *name)`
- `void perror(const char *string)`
- `int setenv(const char *name, const char *value, int overwrite)`
- `sig_t signal(int sig, sig_t func)`
- `pid_t wait(int *status)`
- `pid_t waitpid(pid_t wpid, int *status, int options)`

Deadline: 14th September, Saturday, 5:00 PM

Submission Instruction :

This assignment has to be submitted in two pahases :

1. DEADLINE : 3rd September , 5:00 PM

In this submission, only functionality-1 (Execute all the commands - ls, clear, vi etc.) and Functionality-6 (Pipes – multiple) needs to be implemented.

2. DEADLINE : 14th September , 5:00 PM

Complete Assignment

Upload Format: .tar.gz

Create a folder named your roll number.

Create a “README” file containing the details of functionalities implemented and also place your '.c' or '.cpp' files in the folder.

Create a tar.gz named “Assignment3.tar.gz” and upload it.

NOTE: Use of `system()` will fetch you zero marks.