Project 1 – Minishell

Systems and Systems Programming

Description

For your first project you will write a simple program to read commands from the console and execute them. The minishell should look for commands in the current path to execute and, if they are present, execute them. If the command is not found an error message stating "command not found" should be sent to cerr or stderr. Rather than just executing commands as typed you will have an alias facility. The alias facility will allow the user to customize commands. For example if they would prefer dir rather than ls they would type

alias dir ls

And then when they type dir your program will substitute in ls (for the first argument only). The alias facility can also include multiple words or flags and they can be substituted. Another example would be :

alias print lpr -Plj1026

Print results in two arguments substituted – lpr and –Plj1026

Which would substitute lpr for the first argument followed by -Plj1026 for the second argument.

No, you can't alias an alias – if you said
alias p print
It shouldn't check on print being an alias and substitute in the lpr –Plj1026 command…

You are NOT allowed to use the system call. Must be fork/exec/wait

Your shell should fork and execute the command in a separate process. It should then wait for the command to finish and print out the status code for the job along with the resource usages (see wait3 and wait4 calls).

Lastly, your shell should keep a list of the commands that have been run (a history) and at the end of the shell session it should be saved in a file named .minihistory.

Command after alias substitutions should be saved.

|

In this assignment you will NOT be doing wildcard substitution, redirection, piping, or actually use the history. We may choose to do that later.

Submission:

Turn in your source code and any needed datafiles on BlackBoard.

I will also need directions on compiling your program unless:

All files that are .c or .cpp are compiled together to make your program

No libraries are needed to compile your program

If you forget the directions and they are needed it will delay getting your project graded…

Struct's

- Structures are what was in C prior to C++. They group together fields into a single variable.
- There are no methods with a struct
- There are no access types with a struct (private, public, protected)
- Everything is public – they are just there to allow easy grouping of data.
- Accessed the same way an object would be:

```
struct rusage r;

cout << r.ru_maxrss ;
```

Approach

- I would suggest starting without worrying about alias commands.
- I would simply try to fork/execute/wait on a command typed in by the user and see if that works first. Then the other details could be added in.
  - Need to split the command into pieces – white space should be used to do this.
  - Do not need to worry about escape characters or quotes.
  - Execlp and execvp work with paths. It would be the easier to use one of them.