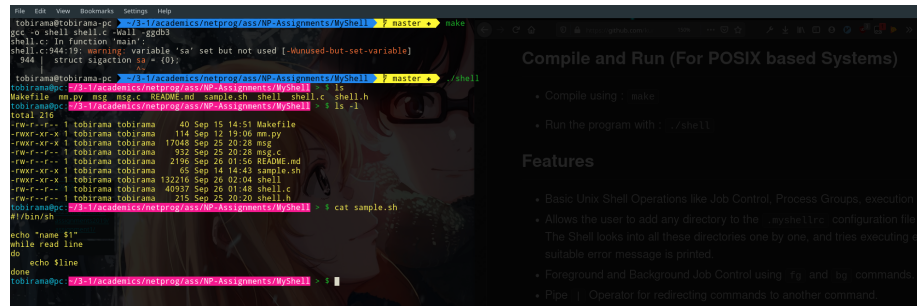


MyShell

This is a simple UNIX Shell made from scratch as part of a Systems programming exercise, implemented in C. This supports basic UNIX shell features and a few more custom commands.

Screenshot



Compile and Run (For POSIX based Systems)

- Compile using : `make`
- Run the program with : `./shell`

Features

- Basic Unix Shell Operations like Job Control, Process Groups, execution of UNIX commands.
- Can change the current working directory of the Shell using `cd` command. Home directory can also be interchanged with `~` when changing directories.
- Allows the user to add any directory to the `~/.myshellrc` configuration file to add to the local `PATH` variable for the Shell. The Shell looks into all these directories one by one, and tries executing each line until there is a success. Otherwise, a suitable error message is printed.
- Can execute `filename` having suitable execute permissions in the current working directory using `./filename`. (Dot Slash commands)
- Foreground and Background Job Control using `fg` and `bg` commands.

Usage (Both `fg` and `bg`):

`fg 1000`

`fg %python`

- Pipe `|` Operator for redirecting commands to another command.

- Redirection >, >> and < Operators for input / output redirection from / to a file respectively.

Usage :

```
ls | grep out > output.txt
```

- Support for System V Message Queues using ## operator. This passes the output of an input command via Message Queues, which then pipes it to other commands. (Note : Unfortunately enough, this is the comment syntax for bash)
- Support for Shared Memory Redirection using SS operator. This is similar to the ## operator, but uses the system's Shared Memory for faster execution and does not have the limitation of a fixed buffer size like Message Queues.

Usage for ## and SS :

```
ls ## wc , sort ## Uses System V Message Queues
```

```
ls SS wc , sort ## Uses Shared Memory
```

- Can start daemon processes with the **daemonize** command.

Usage (Executes **bash script.sh** as a daemon process) :

```
daemonize bash script.sh
```

TODO

- Add some more builtin commands.
- Have implemented a basic AutoComplete Engine using Tries. Incorporate it into the Shell, possibly with the help of the **ncurses** library.

Bugs

- Suspend signal does not work as intended, if the background job waits for **tty** as input.
- & does not allow support with pipes and redirection at present.
- ## Operation for piping via System V Message Queues does not presently support chaining with pipes and redirection operators.
- SS Operation for piping via Shared Memory does not presently support chaining with pipes and redirection operators.
- As of now, any command executes as expected only if there is atleast one space between any two keywords. Even if you want to get the output to multiple commands using ,, you still need to insert a space before and after the comma.
- There is a lot of memory requirement for building the Trie for the Auto-complete Engine incase of a larger autocomplete list. A better solution

could be to sort the autocomplete words and load the indices into a Tree like data structure for fast range querying. Optimize the memory limits and improve it's performance.