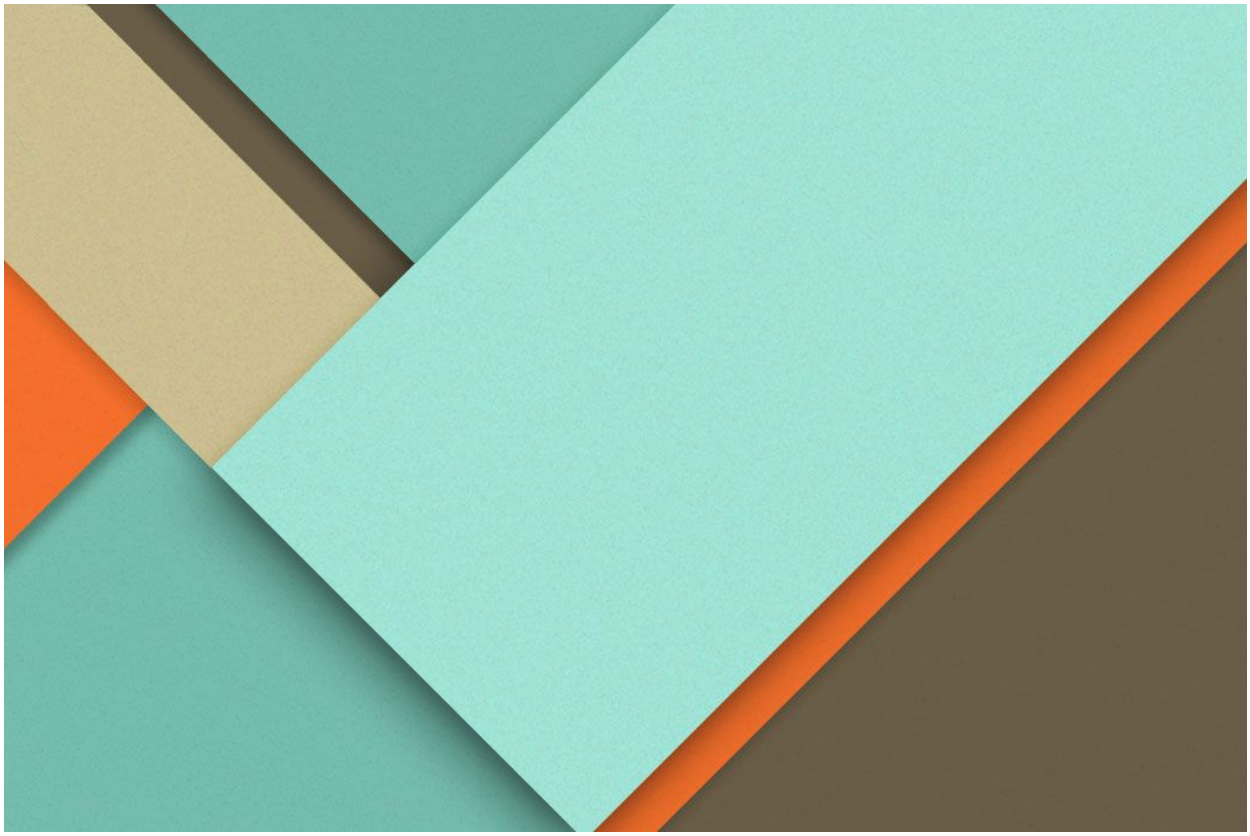


# Simple Shell

Mohamed Hesham Ibrahim Al Khaliji

## Overview

Implementing a UNIX shell program. A shell is simply a program that conveniently allows you to run other programs.

# Goals

1. Familiarity with system calls in Unix environment.
2. Introducing processes and their nesting.

# Code Organization:

The project consists of three classes; “logger” , “shell_core” and “main”. The “shell_core” class contains the basic functions that are responsible for the shell functionality. The “logger” class is responsible for logging whenever a child is terminated in case of asynchronous execution. While the “main” class is only to initialize the shell.

## Functions:

### Class: “shell_core”

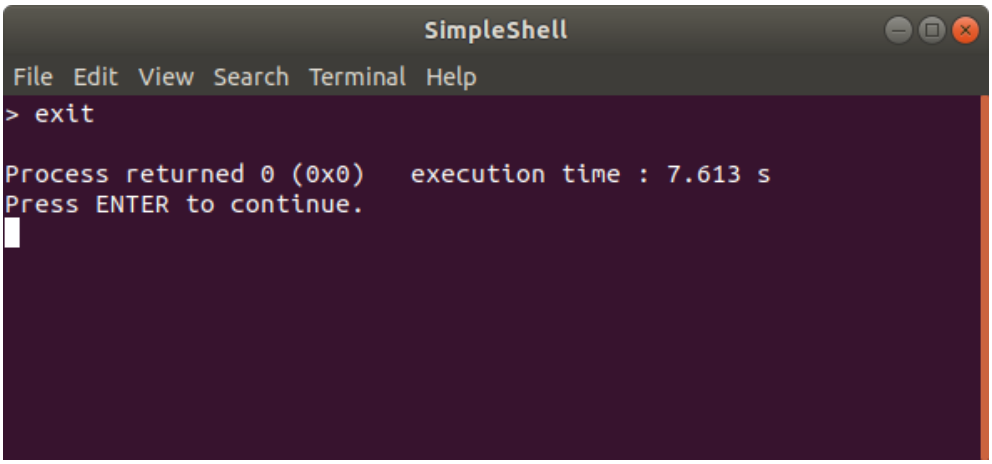
- **“InitializeShell”** : Initializes the basic shell loop which is getting the command line, splitting the command to arguments and finally execute it.
- **“splitCommand”**: Splits the command line from a single string to a vector of strings each containing an argument from the command line.
- **“initializeExecution”**: Determines whether this is an asynchronous or synchronous execution. Also executes some non-execvp-supported commands.
- **“execute”**: Executes execvp-supported commands as either asynchronous or synchronous execution.
- **“signalHandler”** Handles SIGCHLD signal incase of a child termination. Also logs the date and ID of the terminated child.

### Class: “logger”

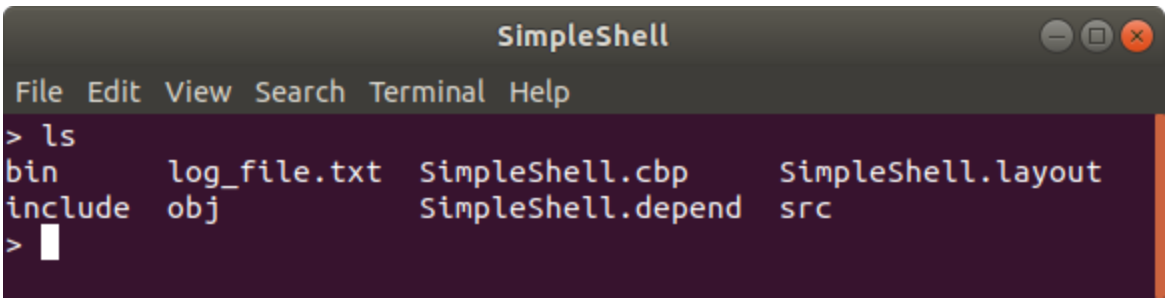
- **“log”**: logs date and ID to a log file when a child is terminated.

## Sample Runs:

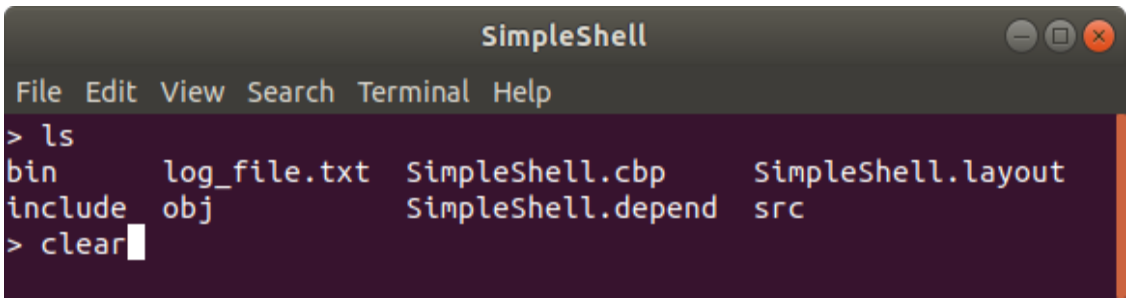
### I. Exit:



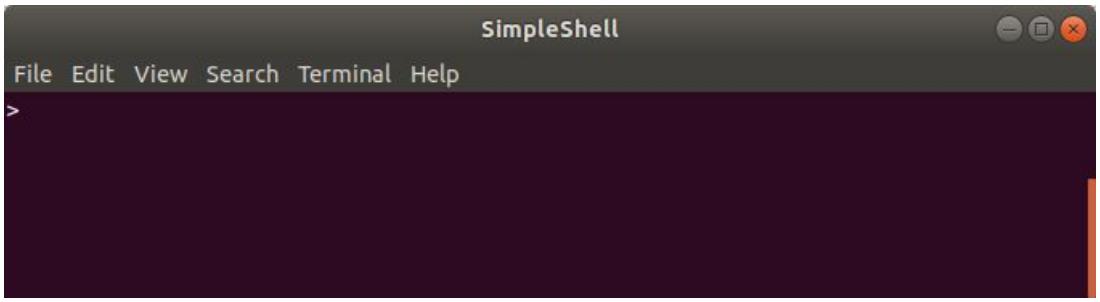

### II. A command with no arguments



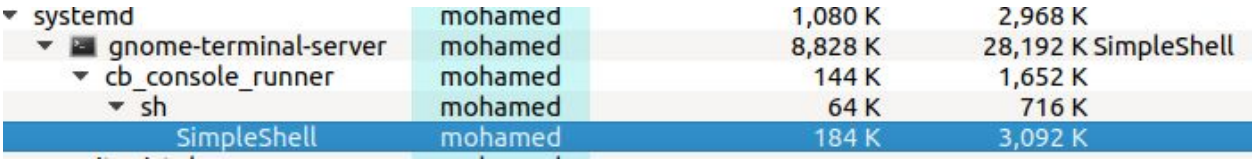

Before “clear” Command:



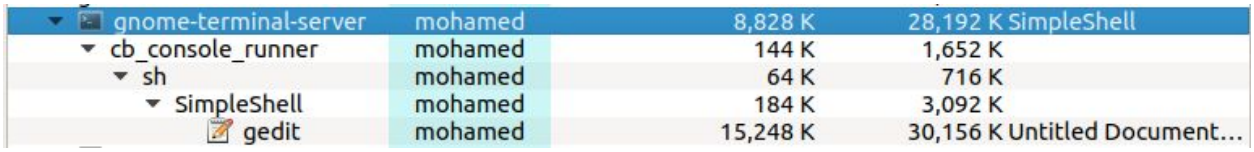
After “clear” command:



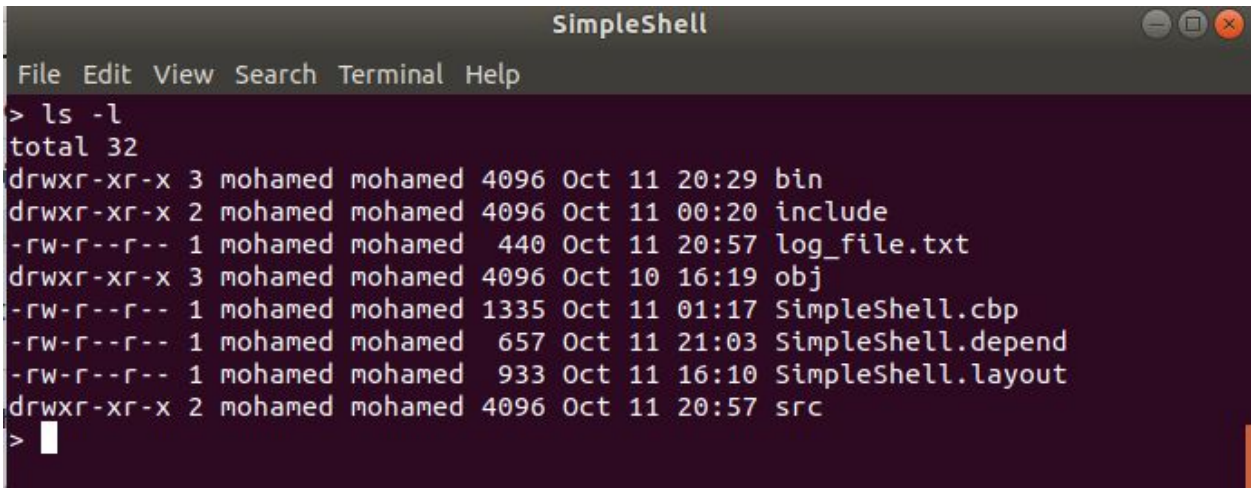

Before “gedit” command:




After “gedit” command




## III. A command with arguments



## IV. A command, with or without arguments, executed in the background

```
> gedit &
> ls -l
total 28
drwxr-xr-x 3 mohamed mohamed 4096 Oct 11 20:29 bin
drwxr-xr-x 2 mohamed mohamed 4096 Oct 11 00:20 include
drwxr-xr-x 3 mohamed mohamed 4096 Oct 10 16:19 obj
-rw-r--r-- 1 mohamed mohamed 1335 Oct 11 01:17 SimpleShell.cbp
-rw-r--r-- 1 mohamed mohamed  709 Oct 11 22:27 SimpleShell.depend
-rw-r--r-- 1 mohamed mohamed  934 Oct 11 21:36 SimpleShell.layout
drwxr-xr-x 2 mohamed mohamed 4096 Oct 11 22:46 src
> ls
bin  include  obj  SimpleShell.cbp  SimpleShell.depend  SimpleShell.layout  src
> ls &
> bin  include  obj  SimpleShell.cbp  SimpleShell.depend        SimpleShell.layo
ut  src
sd
```

# Sample Runs:

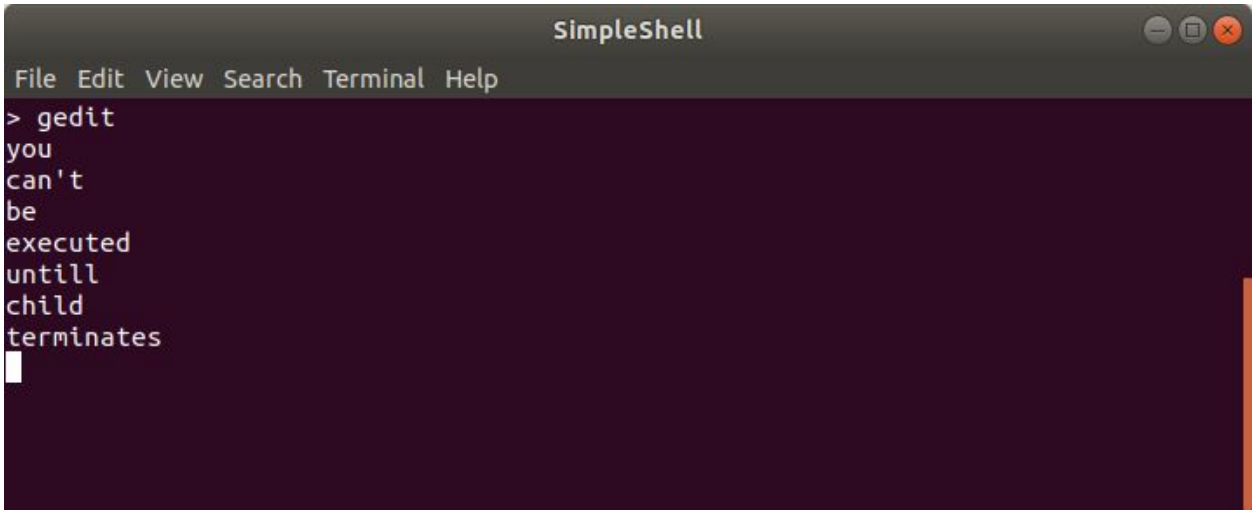
**Asynchronous Execution:**

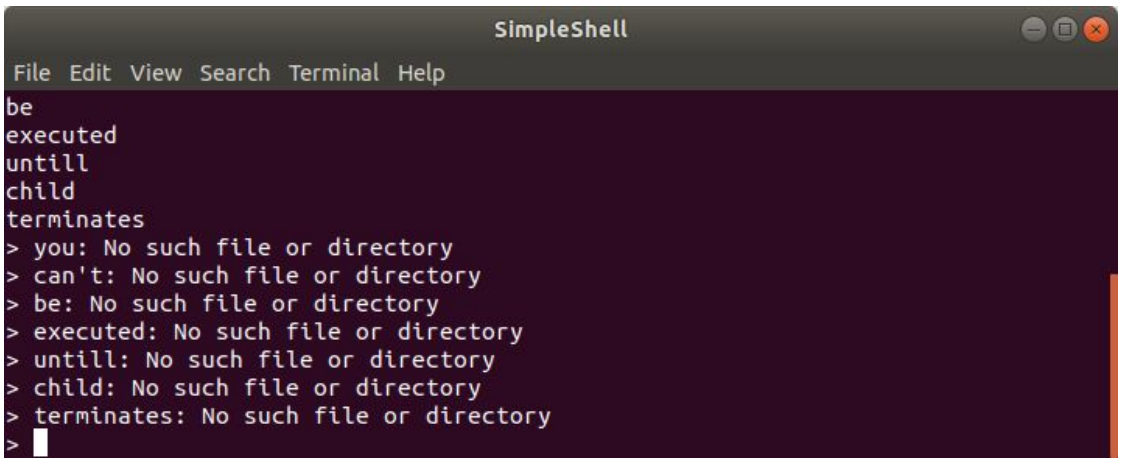
```
SimpleShell
File  Edit  View  Search  Terminal  Help
> gedit &
> vlc &
> VLC media player 3.0.7 Vetinari (revision 3.0.7-0-g86cee31)
[0000000001559400] main libvlc: Running vlc with the default interface. Use 'c
vlc' to use vlc without interface.
Qt: Session management error: None of the authentication protocols specified a
re supported
[00000000015eeff0] main playlist: playlist is empty
```

| | | | |
|---|---|---|---|
| gnome-terminal-server | mohamed | 8,848 K | 28,476 K SimpleShell |
| cb_console_runner | mohamed | 140 K | 1,620 K |
| sh | mohamed | 68 K | 856 K |
| SimpleShell | mohamed | 148 K | 1,736 K |
| vlc | mohamed | 15,524 K | 37,344 K VLC media pla |

**Synchronous Execution:**

Before closing "gedit":




| | | | |
|---|---|---|---|
| gnome-terminal-server | mohamed | 8,884 K | 28,476 K SimpleShell |
| cb_console_runner | mohamed | 140 K | 1,620 K |
| sh | mohamed | 68 K | 856 K |
| SimpleShell | mohamed | 200 K | 3,292 K |
| gedit | mohamed | 15,280 K | 29,864 K Untitled Docu… |

After closing "gedit":