COP 4610
Homework Assignment 1

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FIU
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1-) Make File working properly compiling and cleaning the directory

```
avida059@ocelot:~/os/Alejandro-Vidal-hwl 117% ls
batch  Makefile  myshell.c
avida059@ocelot:~/os/Alejandro-Vidal-hwl 118% make
cc -c myshell.c
cc -o myshell myshell.o
avida059@ocelot:~/os/Alejandro-Vidal-hwl 119% ls
batch  Makefile  myshell*  myshell.c  myshell.o
avida059@ocelot:~/os/Alejandro-Vidal-hwl 120% make clean
rm *.o myshell
avida059@ocelot:~/os/Alejandro-Vidal-hwl 121% ls
batch  Makefile  myshell.c
avida059@ocelot:~/os/Alejandro-Vidal-hwl 122%
```

2-) Interactive Mode Running:

Single commands running in the foreground.

Show the result of running command 'ps' with and without background processes running.

```
avida059@ocelot:~/os/Alejandro-Vidal-hwl 125% ./myshell
***Interactive Mode***
Vidal_Shell>> ls
batch  Makefile  myshell  myshell.c  myshell.o
Vidal_Shell>> ps
There are no processes running in the background at the momment
Vidal_Shell>> sleep 20 &
PID 31895
Vidal_Shell>> ps
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
31895 pts/15   S+     0:00 sleep 20
Vidal_Shell>>
```

3-) Running simultaneously foreground processes and background processes.

Prints PID of the background processes and show in with 'ps' command.

Properly clean the array of background processes after each process ends to avoid showing defunct processes.

```
Vidal_Shell>> ls; sleep 3; ps
There are no processes running in the background at the momment
batch  Makefile  myshell  myshell.c  myshell.o
Vidal_Shell>> sleep 20 &; sleep 10 &; ps
PID 32057
PID 32058
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
32057 pts/15    S+     0:00 sleep 20
32058 pts/15    S+     0:00 sleep 10
Vidal_Shell>> sleep 2; sleep 50 &; ps
PID 32096
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
32057 pts/15    S+     0:00 sleep 20
32096 pts/15    S+     0:00 sleep 50
Vidal_Shell>> ls; ps
Processes running in the background at the momment:
batch  Makefile  myshell  myshell.c  myshell.o
  PID TTY          STAT   TIME COMMAND
32096 pts/15    S+     0:00 sleep 50
Vidal_Shell>>
```

4-) Stop, Resume and Kill commands working properly. Showing the status of the process after each command.

```
Vidal_Shell>> sleep 500 &; sleep 400 &; sleep 300 &; ps
PID 714
PID 715
PID 716
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
  714 pts/15    S+      0:00 sleep 500
  715 pts/15    S+      0:00 sleep 400
  716 pts/15    S+      0:00 sleep 300
Vidal_Shell>> stop 714
Vidal_Shell>> ps
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
  714 pts/15    T+      0:00 sleep 500
  715 pts/15    S+      0:00 sleep 400
  716 pts/15    S+      0:00 sleep 300
Vidal_Shell>> stop 715
Vidal_Shell>> ps
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
  714 pts/15    T+      0:00 sleep 500
  715 pts/15    T+      0:00 sleep 400
  716 pts/15    S+      0:00 sleep 300
Vidal_Shell>> resume 715
Vidal_Shell>> ps
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
  714 pts/15    T+      0:00 sleep 500
  715 pts/15    S+      0:00 sleep 400
  716 pts/15    S+      0:00 sleep 300
Vidal_Shell>> kill 714
Vidal_Shell>> ps
Processes running in the background at the momment:
  PID TTY          STAT   TIME COMMAND
  715 pts/15    S+      0:00 sleep 400
  716 pts/15    S+      0:00 sleep 300
Vidal_Shell>>
```

5-) Batch file Mode. Reading and printing the lines of a batch file and executing all the commands until the end of the file.

```
avida059@ocelot:~/os/Alejandro-Vidal-hw1 127% ./myshell batch
***Batch Mode***
Reading Lines from batch file...

Executing Line:  ls; sleep 200 &; sleep 100 &; ps

PID 913
PID 914
Processes running in the background at the momment:
batch  Makefile  myshell  myshell.c  myshell.o
  PID TTY          STAT   TIME COMMAND
  913 pts/15    S+     0:00 sleep 200
  914 pts/15    S+     0:00 sleep 100

Executing Line:  ls; sleep 20 &; ps

PID 917
Processes running in the background at the momment:
batch  Makefile  myshell  myshell.c  myshell.o
  PID TTY          STAT   TIME COMMAND
  913 pts/15    S+     0:00 sleep 200
  914 pts/15    S+     0:00 sleep 100
  917 pts/15    S+     0:00 sleep 20
avida059@ocelot:~/os/Alejandro-Vidal-hw1 128% 
```

6-) Waiting for all process to finish after exit command

```
avida059@ocelot:~/os/Alejandro-Vidal-hwl 117% ./myshell
***Interactive Mode***
Vidal_Shell>> sleep 5 &; sleep 20 &; ls; ps
PID 7925
PID 7926
Processes running in the background at the momment:
batch  Makefile  myshell  myshell.c  myshell.o
  PID TTY        STAT   TIME COMMAND
 7925 pts/4     S+     0:00 sleep 5
 7926 pts/4     S+     0:00 sleep 20
Vidal_Shell>> exit
Waiting for all procesees to finish...
```

Using quit command to exit after the processes finish:

```
Vidal_Shell>> sleep 5; quit
Waiting for all procesees to finish...
```

7-) Error validation.

-Trying to run batch mode with more than 2 parameter

-Running command with excess of blank spaces

- Ignoring blank line commands

- Validating wrong command and continue whit the execution

- Trying to run batch mode with an incorrect batch file name.

```
avida059@ocelot:~/os/Alejandro-Vidal-hw1 129% ./myshell batch other
Incorrect number of Arguments
Usage: program_name [batch_file_name] (batch_file_name is optional to open batch mode)
avida059@ocelot:~/os/Alejandro-Vidal-hw1 130% ./myshell
***Interactive Mode***
Vidal_Shell>> ls        ;       sleep 20 &   ;   ps
PID 1254
Processes running in the background at the momment:
batch  Makefile  myshell  myshell.c  myshell.o
  PID TTY        STAT    TIME COMMAND
 1254 pts/15   S+     0:00 sleep 20
Vidal_Shell>>       ;       ;
Vidal_Shell>>
Vidal_Shell>> wrongCommand
!!!Execution failed!!!   Incorrect Command:     : No such file or directory
Vidal_Shell>> exit
avida059@ocelot:~/os/Alejandro-Vidal-hw1 131% ./myshell wrongName
***Batch Mode***
Reading Lines from batch file...
The input File does not exist.
avida059@ocelot:~/os/Alejandro-Vidal-hw1 132%
```