

Operating System

Lab Assignment 1

Shell and System Calls

Name: Mohamed Samir Shabaan

code organization:

code consist of one class have some functions to do the target of the program .

main functions:

main : call the other function and determine if interactive mode or batch mode.

Run : determine if we in the child process or in the parent process and execv the valid path.

Batch Mode : read the command from the given file and call the other function to get arguments.

Interactive Mode : get the command from the user and call other function to get arguments until the user enter ctrl-D.

Find Paths: to find all paths using the getenv function.

Initial : to initialize the using arrays.

Read History: to read the history from history file.

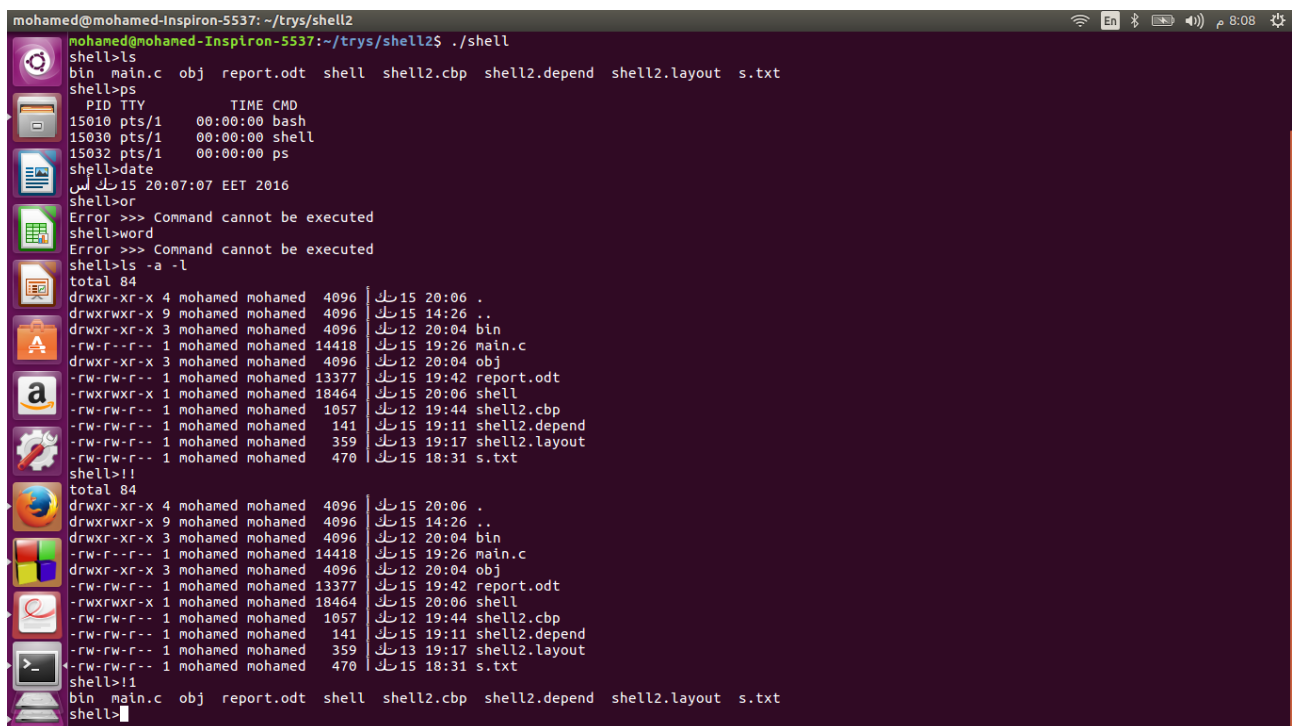
Save History : to save history from least to most when press ctrl-D or exit.

Handle History : call it if the command is !! or !N

how to compile and run the code:

- Open the terminal and go to the project directory.
 - write ./shell if you want to run interactive mode or ./shell file.txt if you want to run batch mode.
- Or use Makefile.

Sample runs:



```
mohamed@mohamed-Inspiron-5537: ~/trys/shell2
mohamed@mohamed-Inspiron-5537:~/trys/shell2$ ./shell
shell>ls
bin main.c obj report.odt shell shell2.cbp shell2.depend shell2.layout s.txt
shell>ps
  PID TTY          TIME CMD
 15010 pts/1    00:00:00 bash
 15030 pts/1    00:00:00 shell
 15032 pts/1    00:00:00 ps
shell>date
Sun 15 20:07:07 EET 2016
shell>or
Error >>> Command cannot be executed
shell>word
Error >>> Command cannot be executed
shell>ls -a -l
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jan 15 20:06 .
drwxrwxr-x 9 mohamed mohamed 4096 Jan 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jan 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14418 Jan 15 19:26 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jan 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jan 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jan 15 20:06 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jan 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jan 15 19:11 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jan 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 470 Jan 15 18:31 s.txt
shell>!!
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jan 15 20:06 .
drwxrwxr-x 9 mohamed mohamed 4096 Jan 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jan 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14418 Jan 15 19:26 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jan 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jan 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jan 15 20:06 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jan 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jan 15 19:11 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jan 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 470 Jan 15 18:31 s.txt
shell>!1
bin main.c obj report.odt shell shell2.cbp shell2.depend shell2.layout s.txt
shell>
```

```
mohamed@mohamed-inspiron-5537: ~/trys/shell2
shell>ls
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jul 15 20:06 .
drwxrwxr-x 9 mohamed mohamed 4096 Jul 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14418 Jul 15 19:20 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jul 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jul 15 20:06 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jul 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jul 15 19:11 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jul 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 470 Jul 15 18:31 s.txt
shell>ls
bin main.c obj report.odt shell shell2.cbp shell2.depend shell2.layout s.txt
shell>ls
shell>ls
error >>> No such command in history.
shell>echo "mohamed
mohamed samir samir sa sa"
shell>ls
Jul 15 20:08:58 EET 2016
shell>ls
Jul 15 20:09:06 EET 2016
shell>ls
PID TTY TIME CMD
15010 pts/1 00:00:00 bash
15030 pts/1 00:00:00 shell
15069 pts/1 00:00:00 ps
shell>history
1 --> or
2 --> word
3 --> ls -a -l
4 --> ls -a -l
5 --> ls
6 --> echo "mohamed samir sa"
7 --> date
8 --> date
9 --> ps
10 --> history
shell>ls
mohamed samir sa
shell>
```

```
mohamed@mohamed-inspiron-5537: ~/trys/shell2
mohamed@mohamed-inspiron-5537:~/trys/shell2$ ./shell s.txt
----->>>ls
bin obj shell shell2.depend s.txt
main.c report.odt shell2.cbp shell2.layout
----->>>ls -al
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jul 15 20:27 .
drwxrwxr-x 9 mohamed mohamed 4096 Jul 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14458 Jul 15 20:20 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jul 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jul 15 20:27 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jul 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jul 15 20:23 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jul 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 468 Jul 15 20:25 s.txt
----->>>ls -a -l
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jul 15 20:27 .
drwxrwxr-x 9 mohamed mohamed 4096 Jul 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14458 Jul 15 20:20 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jul 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jul 15 20:27 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jul 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jul 15 20:23 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jul 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 468 Jul 15 20:25 s.txt
----->>>/bin/ls -l -a
total 84
drwxr-xr-x 4 mohamed mohamed 4096 Jul 15 20:27 .
drwxrwxr-x 9 mohamed mohamed 4096 Jul 15 14:26 ..
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14458 Jul 15 20:20 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jul 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jul 15 20:27 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jul 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jul 15 20:23 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jul 13 19:17 shell2.layout
```

```
mohamed@mohamed-inspiron-5537: ~/trys/shell2
-rw-rw-r-- 1 mohamed mohamed 468 Jul 15 20:25 s.txt
----->>>/bin/ls -l
total 76
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 bin
-rw-r--r-- 1 mohamed mohamed 14458 Jul 15 20:20 main.c
drwxr-xr-x 3 mohamed mohamed 4096 Jul 12 20:04 obj
-rw-rw-r-- 1 mohamed mohamed 13377 Jul 15 19:42 report.odt
-rwxrwxr-x 1 mohamed mohamed 18464 Jul 15 20:27 shell
-rw-rw-r-- 1 mohamed mohamed 1057 Jul 12 19:44 shell2.cbp
-rw-rw-r-- 1 mohamed mohamed 141 Jul 15 20:23 shell2.depend
-rw-rw-r-- 1 mohamed mohamed 359 Jul 13 19:17 shell2.layout
-rw-rw-r-- 1 mohamed mohamed 468 Jul 15 20:25 s.txt
----->>>vim
Error >>> Command cannot be executed
----->>>gedit &
----->>>ps
PID TTY TIME CMD
15439 pts/1 00:00:00 bash
15458 pts/1 00:00:00 shell
15464 pts/1 00:00:00 gedit
15465 pts/1 00:00:00 ps
----->>>/bin/ps
Error >>> Command cannot be executed
----->>>pwd
/home/mohamed/trys/shell2
----->>>mkdir cs333
----->>>touch cs333/lab1.txt
----->>>vi cs333/lab1.txt
----->>>wc cs333/lab1.txt
0 0 0 cs333/lab1.txt
----->>>cat cs333/lab1.txt
----->>>echo z
z
----->>>echo "hello world"
hello world
----->>>echo "hello world"
hello world
----->>>history
1 --> pwd
2 --> mkdir cs333
3 --> touch cs333/lab1.txt
4 --> vi cs333/lab1.txt
5 --> wc cs333/lab1.txt
```