

ELEC 377 Operating Systems F22

Testing Document Lab 3

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testSplitCommand.txt

The split command is used to separate each command into individual words, remove any white spaces and add a NULL byte at the end of the “args” array.

Looking at the split command we can see that the user enters in the sentence “this is a sentence” into the command line on line 3. The output that was generated by the debugger was the list of “args” elements that was retrieved from the command line. On line 5,6,7 and 8, we can see that each word that was printed out from the debugger corresponds to each word/command that was entered by the user. Additionally, on line 9 we can see that the end of the “args” array is set to the NULL byte (aka 0); therefore we can be confident that the function works properly. Another example is shown on lines 10-16.

```
testSplitCommand.txt
1  Script started on 2022-10-27 12:26:03-04:00 [TERM="xterm-256color" TTY="/dev/pts/7" COLUMNS="177" LINES="13"]
2  [0;19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3[0;32m[0;34m~/elec377-Thurs-PM-17/lab3[00m$ ./shell
3  %> this is a sentence
4  4
5  0: this
6  1: is
7  2: a
8  3: sentence
9  4: 0
10 Error command not found.%> this is another sentence
11 4
12 0: this
13 1: is
14 2: another
15 3: sentence
16 4: 0
17 Error command not found.%> exit
18 1
19 0: exit
20 1: 0
21 [0;19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3[0;32m[0;34m~/elec377-Thurs-PM-17/lab3[00m$ exit
22 exit
23
24 Script done on 2022-10-27 12:26:53-04:00 [COMMAND_EXIT_CODE="0"]
25
```

testcommands.txt

The test commands script is the output from our program running several internal commands in the shell. The following commands that were tested with our program include, ls , pwd, cd, and exit.

Looking at line 3, the “ls” command is called and that command lists out all the files in the current working directory (lines 4-11). Now, looking at line 12, the “pwd” command is called and the current working directory is displayed (line 13). Next, we use the “cd ..” command and we move up one directory and we use the “ls” and “pwd” command to verify we’ve changed directories (lines 15-21). We also tested an invalid command on line 22 and the program responded with an error as expected (line 23). Finally, we use the “exit” command to exit out of the program, which caused the program to terminate (line 24-25).

```
C shell.c  testcommands.txt X
testcommands.txt
1 Script started on 2022-10-27 12:29:49-04:00 [TERM="xterm-256color" TTY="/dev/pts/6" COLUMNS="177" LINES="13"]
2 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ ./shell
3 %> ls
4 shell
5 shell.c
6 test1.txt
7 testSplitCommand.txt
8 Makefile
9 hello
10 hello.c
11 testcommands.txt
12 %> pwd
13 The current directory: /home/19ky6/elec377-Thurs-PM-17/lab3
14 %> cd ..
15 %> ls
16 lab2
17 lab3
18 lab0
19 lab1
20 %> pwd
21 The current directory: /home/19ky6/elec377-Thurs-PM-17
22 %> kevin
23 Error command not found.
24 %> exit
25 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ exit
26 exit
27
28 Script done on 2022-10-27 12:30:38-04:00 [COMMAND_EXIT_CODE="0"]
29
```

We can verify that the program is working properly by repeating these commands in the actual shell in VSCode. (Note exit command is left out since it would close the terminal).

```
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ ls
Makefile hello hello.c shell shell.c test1.txt testHello.txt testSplitCommand.txt testUsrBin.txt testcommands.txt
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ pwd
/home/19ky6/elec377-Thurs-PM-17/lab3
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ cd ..
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17$ ls
lab0 lab1 lab2 lab3
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17$ pwd
/home/19ky6/elec377-Thurs-PM-17
19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17$
```

testHello.txt

The testHello.txt file is the output when executing the “hello” binary file in the current working directory which is supposed to print a message to the console.

We can see that when we execute “hello” (on line 3) in our program, the program responds with “Hello 19ky6” which is what is expected of the program.

```
testHello.txt X
testHello.txt
1 Script started on 2022-10-27 12:44:44-04:00 [TERM="xterm-256color" TTY="/dev/pts/5" COLUMNS="177" LINES="13"]
2 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ ./shell
3 %> hello
4 Hello 19ky6
5 %> exit
6 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ exit
7 exit
8
9 Script done on 2022-10-27 12:44:53-04:00 [COMMAND_EXIT_CODE="0"]
10
```

We can verify this is the correct action by executing the program in VSCode's terminal

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● 19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ ./hello
Hello 19ky6
○ 19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$
```

testUsrBin.txt

testUsrBin.txt file is the output that is produced when executing a command from /usr/bin directory. Our program calls the “dirname /usr/bin” on line 3 and the result that is returned is on line 4. Another test command is executed on line 5, “file testHello.txt” and the result is returned on line 6.

```
testUsrBin.txt x
testUsrBin.txt
1 Script started on 2022-10-27 12:45:12-04:00 [TERM="xterm-256color" TTY="/dev/pts/5" COLUMNS="177" LINES="13"]
2 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ ./shell
3 %> dirname /usr/bin
4 /usr
5 %> file testHello.txt
6 testHello.txt: ASCII text, with CRLF, LF line terminators, with escape sequences
7 %> exit
8 19ky6@elec377-Thurs-PM-17: ~/elec377-Thurs-PM-17/lab3$ exit
9 exit
10
11 Script done on 2022-10-27 12:46:38-04:00 [COMMAND_EXIT_CODE="0"]
12
```

We can verify these commands are correct by using VSCode's terminal and executing the commands there:

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● 19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ dirname /usr/bin
/usr
● 19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$ file testHello.txt
testHello.txt: ASCII text, with CRLF, LF line terminators, with escape sequences
○ 19ky6@elec377-Thurs-PM-17:~/elec377-Thurs-PM-17/lab3$
```