

CS 481 Programming Assignment 04

Ezra Stallings & Luke Balaoro

10/06/2014

Implementation Details

We used a linked list to track our background processes so we could later terminate them. We also used a second process for every child to track the *getrusage*, to avoid accidentally adding the background process time to the usage. Beyond that, it was relatively straightforward; parsing string input, forking, and calling `execvp` with the parsed arguments.

Snapshots

```

lbalaor@ganymede: ~/Desktop/shell
File Edit View Search Terminal Help

September 2014      October 2014      November 2014
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
 1  2  3  4  5  6          1  2  3  4          1
 7  8  9 10 11 12 13    5  6  7  8  9 10 11    2  3  4  5  6  7  8
14 15 16 17 18 19 20   12 13 14 15 16 17 18    9 10 11 12 13 14 15
21 22 23 24 25 26 27   19 20 21 22 23 24 25   16 17 18 19 20 21 22
28 29 30             26 27 28 29 30 31        23 24 25 26 27 28 29
                                   30

lbalaor@ganymede ~
-> cd Desktop/shell                                     19:55:40

lbalaor@ganymede ~/Desktop/shell
-> cc minsh.c && ./a.out                                [ master * ] 19:55:45
minsh-LB-ES: ls -al
ToRun: 0:ls, 1:-al,
total 32
drwx----- 3 lbalaor ugrad 4096 Oct  6 19:55 .
drwxrwxrwx 11 lbalaor ugrad 4096 Oct  4 15:35 ..
-rwx----- 1 lbalaor ugrad 8931 Oct  6 19:55 a.out
drwx----- 8 lbalaor ugrad 4096 Oct  6 19:55 .git
-rw----- 1 lbalaor ugrad  223 Oct  4 15:35 .gitignore
-rw----- 1 lbalaor ugrad 1653 Oct  6 19:54 minsh.c
-rw----- 1 lbalaor ugrad   39 Oct  4 15:35 README.md
CompleteRun(PID:12097): ls -- user time 0.000000 system time 0.000000
minsh-LB-ES: emacs &
ToRun: 0:emacs,
minsh-LB-ES: exit
ToRun: 0:exit,

lbalaor@ganymede ~/Desktop/shell

```

Snapshot 1: running `ls` and `emacs`

```

Ibalaor@ganymede: ~/Desktop/shell
File Edit View Search Terminal Help

September 2014      October 2014      November 2014
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
  1  2  3  4  5  6          1  2  3  4          1
  7  8  9 10 11 12 13    5  6  7  8  9 10 11    2  3  4  5  6  7  8
14 15 16 17 18 19 20   12 13 14 15 16 17 18    9 10 11 12 13 14 15
21 22 23 24 25 26 27   19 20 21 22 23 24 25   16 17 18 19 20 21 22
28 29 30             26 27 28 29 30 31       23 24 25 26 27 28 29
                                   30

Ibalaor@ganymede ~
-> cd Desktop/shell                                     19:59:09

Ibalaor@ganymede ~/Desktop/shell

-> cc minsh.c && ./a.out                                [ master * ] 19:59:18
minsh-LB-ES: ls
ToRun: 0:ls,
a.out minsh.c README.md
CompleteRun(PID:13231): ls -- user time 0.000000 system time 0.000000
minsh-LB-ES: cc minsh.c -o minsh
ToRun: 0:cc, 1:minsh.c, 2:-o, 3:minsh,
CompleteRun(PID:13233): cc -- user time 0.024001 system time 0.008000
minsh-LB-ES: ls
ToRun: 0:ls,
a.out minsh minsh.c README.md
CompleteRun(PID:13239): ls -- user time 0.000000 system time 0.000000
minsh-LB-ES: ./minsh
ToRun: 0:./minsh,
minsh-LB-ES: echo "meta-minsh"
ToRun: 0:echo, 1:"meta-minsh",
"meta-minsh"
CompleteRun(PID:13243): echo -- user time 0.000000 system time 0.000000
0
minsh-LB-ES: exit
ToRun: 0:exit,
CompleteRun(PID:13241): ./minsh -- user time 0.000000 system time 0.000000
minsh-LB-ES: exit
ToRun: 0:exit,

Ibalaor@ganymede ~/Desktop/shell

-> |                                                    [ master * ] 20:00:20

```

Snapshot 2: compiling and running minsh inside of minsh