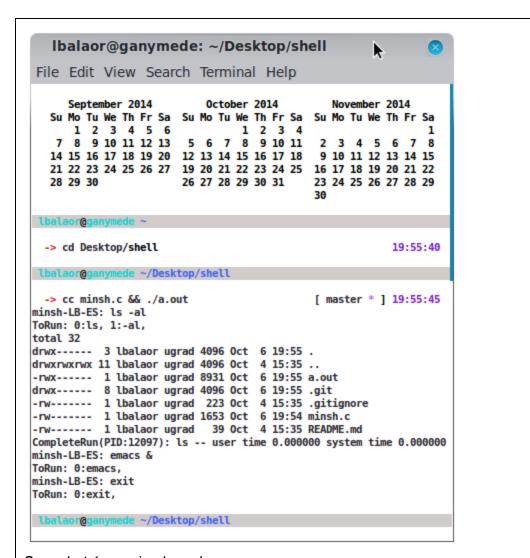
CS 481 Programming Assignment 04

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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



Snapshot 1: running Is and emacs

Balaoro/Stallings

```
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
   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
lbalaor@ganymede
 -> cd Desktop/shell
                                                          19:59:09
lbalaor@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: θ: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: θ: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: θ:./minsh,
minsh-LB-ES: echo "meta-minsh"
ToRun: θ:echo, 1:"meta-minsh",
CompleteRun(PID:13243): echo -- user time 0.000000 system time 0.00000
minsh-LB-ES: exit
ToRun: θ:exit,
CompleteRun(PID:13241): ./minsh -- user time 0.000000 system time 0.00
minsh-LB-ES: exit
ToRun: θ:exit,
lbalaor@ganymede ~/Desktop/shell
  ->
                                             [ master * ] 20:00:20
```

Snapshot 2: compiling and running minsh inside of minsh