Assignment 2

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1 Integrity

I confirm that I will keep the content of this assignment confidential. I confirm that I have not received any unauthorized assistance in preparing for or writing this assignment. I acknowledge that a mark of 0 may be assigned for copied work. Dilpreet Chana #104570850.

2 Implementation Details

The programs forks the main process to create a child which exits right away. The parent waits 10 seconds and creates another child to check the processes. A zombie process is now found in the process list and the parent pauses. The list of processes is printed.

3 Output One

```
  UID   PID  PPID        F CPU PRI NI       SZ    RSS WCHAN
S     ADDR TTY           TIME CMD
  501   544   542     4006   0  31  0  4333880   1080 -
S        0 ttys000    0:00.33 -zsh
  501   961   544     4006   0  31  0  4290912    568 -
S+       0 ttys000    0:00.01 tmux
  501   964   963     4006   0  31  0  4333944   3784 -
Ss       0 ttys001    0:00.55 -zsh
  501  4171   964     4006   0  31  0  4275952    840 -
S+       0 ttys001    0:00.01 ./a2
  501  4172  4171     2006   0   0  0        0      0 -
Z+       0 ttys001    0:00.00 (a2)
  501  1054   963     4006   0  31  0  4308344   2440 -
Ss+      0 ttys002    0:00.22 -zsh
```

4 Output Two

```
  UID   PID  PPID        F CPU PRI NI       SZ    RSS WCHAN
S     ADDR TTY           TIME CMD
  501   544   542     4006   0  31  0  4333880   1080 -
S        0 ttys000    0:00.33 -zsh
  501   961   544     4006   0  31  0  4290912    568 -
S+       0 ttys000    0:00.01 tmux
  501   964   963     4006   0  31  0  4333944   3864 -
Ss       0 ttys001    0:00.60 -zsh
  501  4227   964     4006   0  31  0  4267760    836 -
S+       0 ttys001    0:00.00 ./a2
  501  4228  4227     2006   0   0  0        0      0 -
Z+       0 ttys001    0:00.00 (a2)
  501  1054   963     4006   0  31  0  4308344   2440 -
Ss+      0 ttys002    0:00.22 -zsh
  501  4229   963     4006   0  31  0  4300152   3848 -
Ss+      0 ttys003    0:00.22 -zsh
```

5 Source Code

```
/*
 * Title:         a2.c
 * Author:        Dilpreet S. Chana
 * Description:   Create zombie process. Kill any parents of
 *                zombie process.
**/

#include <fcntl.h>
#include <unistd.h>
#include <sys/stat.h>
#include <sys/types.h>
#include <stdlib.h>
#include <stdio.h>

int main() {
        pid_t pid;

        // Parent
        if ((pid = fork()) > 0) {
                sleep(10);
                printf("10␣seconds␣later...␣what␣is␣my␣child??\n");

                // Another child
                if ((pid = fork()) == 0) {
                        execlp("ps", "ps", "-l", (char*)NULL);
                }
                sleep(1);
                printf("My child is a zombie\n");
                pause();
        }
        else {  // Child
                exit(0);
        }

        return 0;
}
```