

Operating Systems – ex2 tester

אופן השימוש:

- יש להריץ את כל הטסטים ב-Session אחד רציף, כך שאם יש באג שנוצר עקב קומבינציה מסויימת של פקודות, ישנה סבירות גבוהה יותר שנמצא אותו.
- בכל בלוק פקודות (תמונה אחת של הטרמינל), יש להריץ את כל הפקודות בזו אחר זו מבלי להמתין (אלא אם כן נאמר אחרת).
- אין שוני בין הנראות של הקלטים והפלטים בטסטים, מאמין שתוכלו להבדיל ביניהם על סמך ההגיון.
- ממליץ לראות שמריצים את הטסטר בתיקייה שהתוכן שלה הוא דומה לשלי:
a.out, myshell.c, shell.c
אצלי myshell.c נקרא myshell_moodle.c, תתעלמו מכך.

הערה: בטסטים מופיע שיש ירידת שורה לאחר ^C (Ctrl + C). ירידת השורה הוכנסה בצורה מלאכותית מטעמי אסתטיקה, ולא משנה כלום בנוגע לתוצאות הבדיקות.

Test 1 – Random commands

```
ls
a.out myshell_moodle.c shell.c
```

```
sleep 50
echo 1
^C
echo 2
2
```

```
sleep 50
^C
echo 1
1
```

```
sleep 50 &
echo 1
1
```

```
ls -la | grep shell.c
-rw-r--r-- 1 amitgabay math1 1363 Nov 8 18:08 shell.c
```

```
ls | cat
a.out
myshell_moodle.c
shell.c
```

```
cat shell.c | grep void
int prepare(void);
int finalize(void);
int main(void)
```

```
ls -la > output.txt
cat output.txt
total 40
drwxr-xr-x 2 amitgabay math1 4096 Nov 11 14:12 .
drwxr-xr-x 4 amitgabay math1 4096 Nov 8 18:10 ..
-rwxr-xr-x 1 amitgabay math1 13896 Nov 10 13:32 a.out
-rw-r--r-- 1 amitgabay math1 9546 Nov 8 18:09 myshell_moodle.c
-rwxr-xr-x 1 amitgabay math1 0 Nov 11 14:12 output.txt
-rw-r--r-- 1 amitgabay math1 1363 Nov 8 18:08 shell.c
```

- Note that our brand new file 'output.txt' should appear in the list
- Wait for 'sleep 50 &' to terminate

```
sleep 50 | echo Done
Done
echo not_really
^C
```

- Make sure that 'Done' is printed immediately – In order to assert that you're executing 'sleep' and 'echo' concurrently

Test 2 – Zombie process prevention

```
sleep 10 &
ps
  PID TTY          TIME CMD
 24751 pts/60    00:00:00 tcsh
 29746 pts/60    00:00:00 a.out
 29855 pts/60    00:00:00 sleep
 29856 pts/60    00:00:00 ps
```

- Wait 10 seconds

```
ps
  PID TTY          TIME CMD
 24751 pts/60    00:00:00 tcsh
 29746 pts/60    00:00:00 a.out
 29864 pts/60    00:00:00 ps
```

- Verify that there's no other process and especially no <defunct>

```
echo zombies | grep z
zombies
ps
  PID TTY          TIME CMD
 24751 pts/60    00:00:00 tcsh
 29746 pts/60    00:00:00 a.out
 31201 pts/60    00:00:00 ps
```

```
echo zombies > zombie.txt
cat zombie.txt
zombies
ps
  PID TTY          TIME CMD
 24751 pts/60    00:00:00 tcsh
 29746 pts/60    00:00:00 a.out
 31526 pts/60    00:00:00 ps
```

```
ls
a.out  myshell_moodle.c  output.txt  shell.c  zombie.txt
ps
  PID TTY          TIME CMD
 24751 pts/60    00:00:00 tcsh
 29746 pts/60    00:00:00 a.out
 31249 pts/60    00:00:00 ps
```

Test 3 – Error handling

```
invalidcmd | echo 1
Invalid shell command: No such file or directory
1
```

- The order between '1' and the error message doesn't matter. It depends on which child process terminates faster

```
ls | invalidcmd
Invalid shell command: No such file or directory
```

```
invalidcmd | invalidcmd
Invalid shell command: No such file or directory
Invalid shell command: No such file or directory
```

```
invalidcmd &
Invalid shell command: No such file or directory
```

```
invalidcmd > file.txt
Invalid shell command: No such file or directory
ls
a.out  file.txt  myshell_moodle.c  output.txt  shell.c  zombie.txt
```

- Make sure that file.txt exists

```
invalidcmd
Invalid shell command: No such file or directory
```

```
cat invalidfile.txt
cat: invalidfile.txt: No such file or directory
```

Test 4 – Signals

```
sleep 50 &
ps
  PID TTY          TIME CMD
  9046 pts/60      00:00:00 sleep
  9047 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
kill -SIGINT 9046
ps
  PID TTY          TIME CMD
  9046 pts/60      00:00:00 sleep
  9053 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
kill -SIGTERM 9046
ps
  PID TTY          TIME CMD
  9057 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
```

- Replace '9046' by the PID of sleep as shown in your terminal
- Make sure that SIGINT won't kill background processes even if sent directly to them

```
sleep 50
^C
ps
  PID TTY          TIME CMD
  9311 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
```

```
sleep 50 | sleep 50
^C
ps
  PID TTY          TIME CMD
  9294 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
```

```
sleep 50 > junk.txt
^C
ps
  PID TTY          TIME CMD
  9320 pts/60      00:00:00 ps
 24751 pts/60      00:00:00 tcsh
 29746 pts/60      00:00:00 a.out
cat junk.txt
rm junk.txt
```

Test 5 – Additional commands

```
man sleep
```

- Press enter and the output should be:

```
SLEEP(1)                                User Commands                                SLEEP(1)

NAME
    sleep - delay for a specified amount of time

SYNOPSIS
    sleep NUMBER[SUFFIX]...
    sleep OPTION

DESCRIPTION
    Pause for NUMBER seconds. SUFFIX may be 's' for seconds (the default), 'm' for minutes, 'h' for hours or 'd'
    for days. Unlike most implementations that require NUMBER be an integer, here NUMBER may be an arbitrary
    floating point number. Given two or more arguments, pause for the amount of time specified by the sum of
    their values.

    --help display this help and exit

    --version
        output version information and exit

AUTHOR
    Written by Jim Meyering and Paul Eggert.

REPORTING BUGS
    Report sleep bugs to bug-coreutils@gnu.org
Manual page sleep(1) line 1 (press h for help or q to quit)
```

- Press q and you should return to the previous screen

```
echo hey > file1.txt
echo hi > file2.txt
cmp file1.txt file2.txt
file1.txt file2.txt differ: byte 2, line 1
```

```
echo keep_your_secrets_here > bonus_questions.txt
cat bonus_questions.txt
keep_your_secrets_here
chmod 000 bonus_questions.txt
cat bonus_questions.txt
cat: bonus_questions.txt: Permission denied
```

```
rm bonus_questions.txt
rm: remove write-protected regular file 'bonus_questions.txt'? y
ls | grep bonus
```

```
ps
  PID TTY          TIME CMD
 7200 pts/60    00:00:00 ps
24751 pts/60    00:00:00 tcsh
29746 pts/60    00:00:00 a.out
```

- Make sure that there are no zombie processes

אם הגעתם עד לכאן כנראה שאתם בסדר.