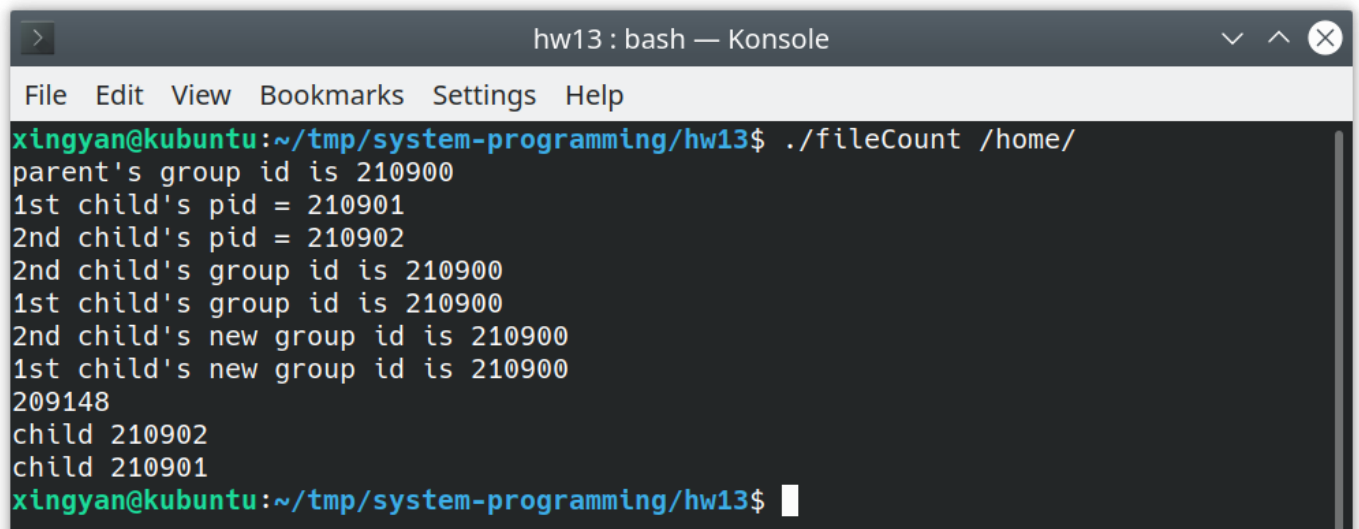


System programming homework #13

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完成(1)(2)(3)

1. 請參考 pipe4-3 的寫法,設計應用程式『fileCount /YYY』讓你的應用程式可以自動執行『ls -R /YYY | wc -l』計算/YYY 目錄下大約有多少字元



```
hw13 : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~/tmp/system-programming/hw13$ ./fileCount /home/
parent's group id is 210900
1st child's pid = 210901
2nd child's pid = 210902
2nd child's group id is 210900
1st child's group id is 210900
2nd child's new group id is 210900
1st child's new group id is 210900
209148
child 210902
child 210901
xingyan@kubuntu:~/tmp/system-programming/hw13$
```

2. 請確保你的主程式『fileCount』收到 ctrl+c 以後,可已讓『ls -R/YYY | wc -l』立即中止

將 child1 和 child2 設定到同一個 group，並接收 SIGINT 訊號，收到 ctrl+c 時，會把 ls 和 wc 兩個同時 kill，因此可以立即中止。

```
void signal_ctr_c(int signum) {
    //殺掉process group

    fprintf(stderr, "kill process group %d\n", -1*pid1);
    kill(-1*pid1, signum);

    //parent結束離開
    _exit(0);
}
```

Group 設定狀況

```
hw13 : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~/tmp/system-programming/hw13$ ./fileCount
parent's group id is 209554
1st child's pid = 209555
1st child's group id is 209554
1st child's new group id is 209555
2nd child's pid = 209556
2nd child's group id is 209554
2nd child's new group id is 209555
12
child 209556
child 209555
xingyan@kubuntu:~/tmp/system-programming/hw13$
```

按下 `ctr+c` 程式立即中止

```
hw13 : bash — Konsole
File Edit View Bookmarks Settings Help
ls: cannot open directory '/root': Permission denied
ls: cannot open directory '/run/cryptsetup': Permission denied
ls: cannot open directory '/run/cups/certs': Permission denied
ls: cannot open directory '/run/initramfs': Permission denied
ls: cannot open directory '/run/sudo': Permission denied
ls: cannot open directory '/run/systemd/ask-password-block': Permission denied
ls: cannot open directory '/run/systemd/inaccessible': Permission denied
ls: cannot open directory '/run/systemd/resolve/netif': Permission denied
ls: cannot open directory '/run/systemd/unit-root': Permission denied
ls: cannot open directory '/run/udisks2': Permission denied
ls: cannot open directory '/run/user/1000/inaccessible': Permission denied
ls: cannot open directory '/run/wpa_supplicant': Permission denied
ls: cannot open directory '/snap/core18/1997/etc/ssl/private': Permission denied
ls: cannot open directory '/snap/core18/1997/root': Permission denied
ls: cannot open directory '/snap/core18/1997/var/cache/ldconfig': Permission denied
ls: cannot open directory '/snap/core18/1997/var/lib/private': Permission denied
ls: cannot open directory '/snap/core18/2066/etc/ssl/private': Permission denied
ls: cannot open directory '/snap/core18/2066/root': Permission denied
ls: cannot open directory '/snap/core18/2066/var/cache/ldconfig': Permission denied
ls: cannot open directory '/snap/core18/2066/var/lib/private': Permission denied
^Ckill process group -209337
xingyan@kubuntu:~/tmp/system-programming/hw13$
```

3. 你是否可以在不修改 SIGINT 的 signal handler 的情況下完成第二小題呢？

可以，因為若沒有特別設定 group，child 會屬於主程式的 group，因此直接按下 `ctr+c` 會殺掉主程式，同時殺掉在同一個 group 的 child

Group 設定狀況，可以看到預設 child 跟著主程式屬於同個 group

```
hw13 : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~/tmp/system-programming/hw13$ ./fileCount
parent's group id is 211478
1st child's pid = 211479
1st child's group id is 211478
1st child's new group id is 211478
2nd child's pid = 211480
2nd child's group id is 211478
2nd child's new group id is 211478
14
child 211480
child 211479
xingyan@kubuntu:~/tmp/system-programming/hw13$
```

按下 `ctr+c` 程式立即中止

```
hw13 : bash — Konsole
File Edit View Bookmarks Settings Help
ls: cannot open directory '/root': Permission denied
ls: cannot open directory '/run/cryptsetup': Permission denied
ls: cannot open directory '/run/cups/certs': Permission denied
ls: cannot open directory '/run/initramfs': Permission denied
ls: cannot open directory '/run/sudo': Permission denied
ls: cannot open directory '/run/systemd/ask-password-block': Permission denied
ls: cannot open directory '/run/systemd/inaccessible': Permission denied
ls: cannot open directory '/run/systemd/resolve/netif': Permission denied
ls: cannot open directory '/run/systemd/unit-root': Permission denied
ls: cannot open directory '/run/udisks2': Permission denied
ls: cannot open directory '/run/user/1000/inaccessible': Permission denied
ls: cannot open directory '/run/wpa_supplicant': Permission denied
ls: cannot open directory '/snap/core18/1997/etc/ssl/private': Permission denied
ls: cannot open directory '/snap/core18/1997/root': Permission denied
ls: cannot open directory '/snap/core18/1997/var/cache/ldconfig': Permission denied
ls: cannot open directory '/snap/core18/1997/var/lib/private': Permission denied
ls: cannot open directory '/snap/core18/2066/etc/ssl/private': Permission denied
ls: cannot open directory '/snap/core18/2066/root': Permission denied
ls: cannot open directory '/snap/core18/2066/var/cache/ldconfig': Permission denied
ls: cannot open directory '/snap/core18/2066/var/lib/private': Permission denied
^C
xingyan@kubuntu:~/tmp/system-programming/hw13$
```