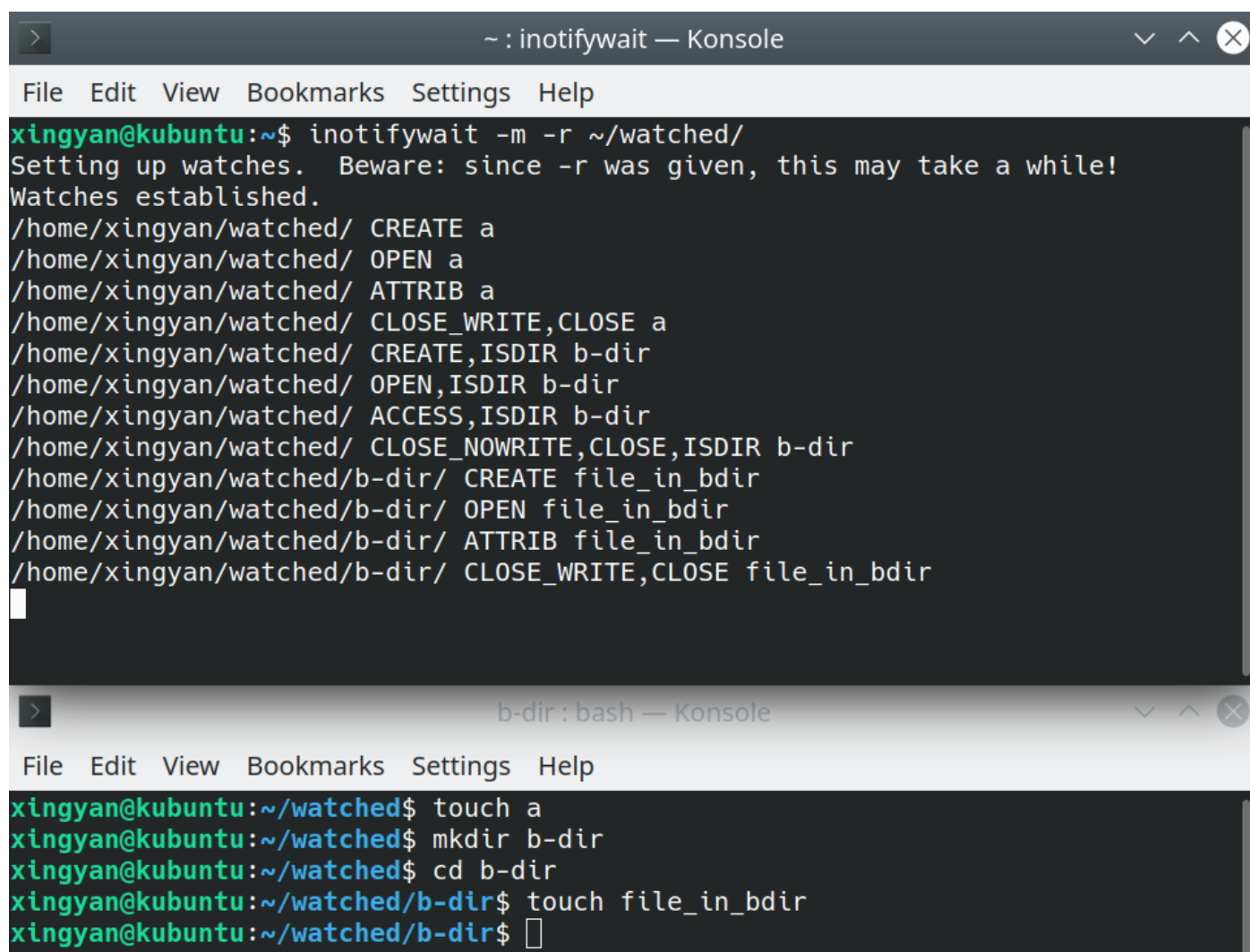


System programming homework #7

王興彥 408410113

丁. 執行指令『touch a』，『mkdir b-dir』，『cd b-dir』並在 b-dir 內建立一個檔案『touch file_in_bdir』。

除了『cd b-dir』沒有產生訊息外，其他指令依序產生了四行訊息，並且都有 CREATE · OPEN · CLOSE 訊息，因為我們所執行的指令都跟建立新的目錄和檔案相關。



```
> ~ : inotifywait — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~$ inotifywait -m -r ~/watched/
Setting up watches. Beware: since -r was given, this may take a while!
Watches established.
/home/xingyan/watched/ CREATE a
/home/xingyan/watched/ OPEN a
/home/xingyan/watched/ ATTRIB a
/home/xingyan/watched/ CLOSE_WRITE,CLOSE a
/home/xingyan/watched/ CREATE,ISDIR b-dir
/home/xingyan/watched/ OPEN,ISDIR b-dir
/home/xingyan/watched/ ACCESS,ISDIR b-dir
/home/xingyan/watched/ CLOSE_NOWRITE,CLOSE,ISDIR b-dir
/home/xingyan/watched/b-dir/ CREATE file_in_bdir
/home/xingyan/watched/b-dir/ OPEN file_in_bdir
/home/xingyan/watched/b-dir/ ATTRIB file_in_bdir
/home/xingyan/watched/b-dir/ CLOSE_WRITE,CLOSE file_in_bdir

```

```
> b-dir : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~/watched$ touch a
xingyan@kubuntu:~/watched$ mkdir b-dir
xingyan@kubuntu:~/watched$ cd b-dir
xingyan@kubuntu:~/watched/b-dir$ touch file_in_bdir
xingyan@kubuntu:~/watched/b-dir$
```

戊. 在 b 目錄底下執行 vim。

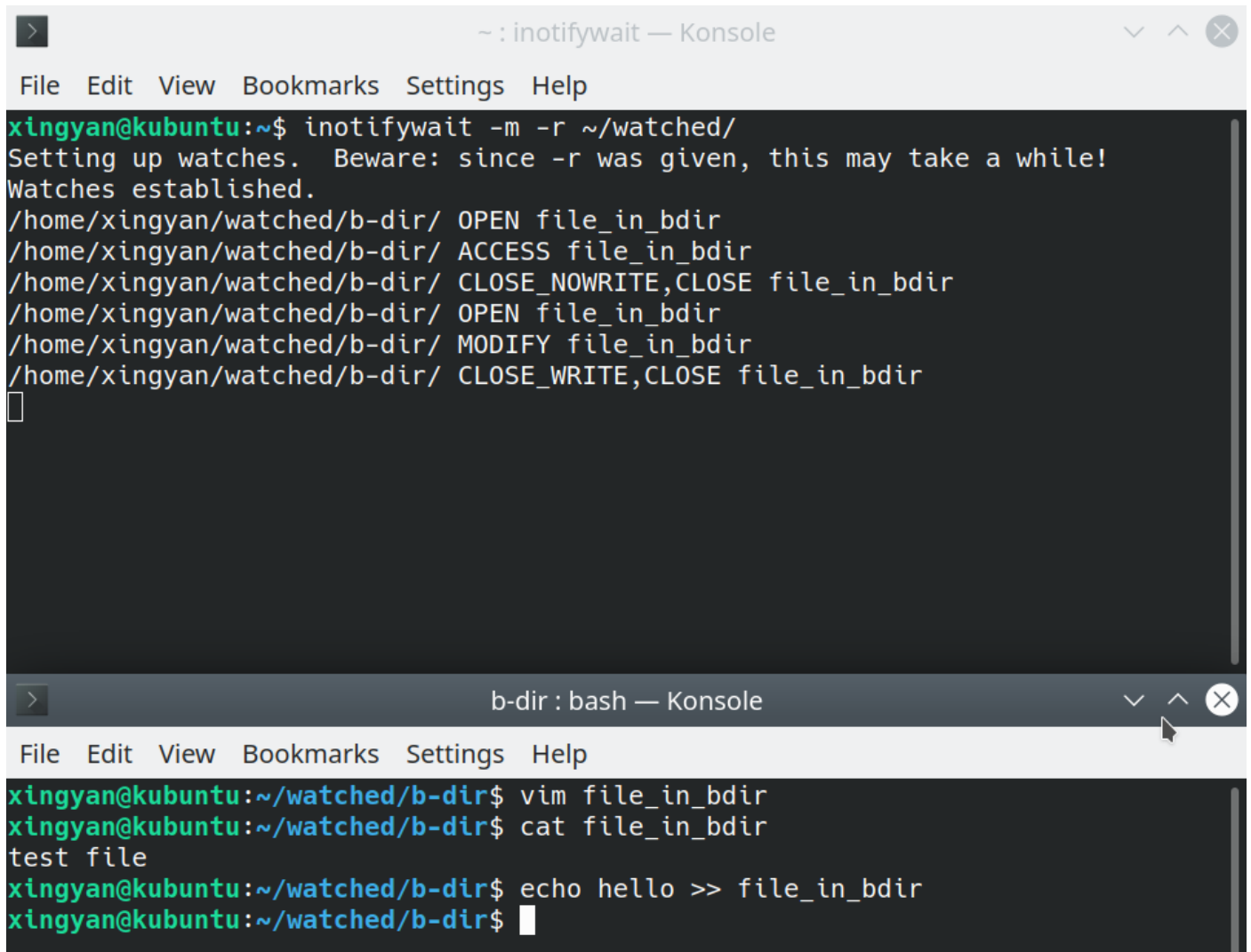
前兩張為開啟 vim 所產生的訊息，第三章為更改內容並儲存和退出所產生的訊息。

[illegible]

己. cat file_in_bdir

庚. echo hello >> file_in_bdir

cat 要將檔案串連接後傳到基本輸出，所以需要 ACCESS，而 echo 將字串輸入到檔案內，所以需要更改檔案內容，因此訊息顯示 MODIFY。



The image shows two terminal windows. The top window, titled '~ : inotifywait — Konsole', shows the execution of `inotifywait -m -r ~/watched/`. It displays the process of setting up watches and lists the operations performed on `file_in_bdir`: OPEN, ACCESS, CLOSE_NOWRITE, CLOSE, OPEN, MODIFY, and CLOSE_WRITE, CLOSE. The bottom window, titled 'b-dir : bash — Konsole', shows the user navigating to `~/watched/b-dir` and performing file operations: `vim file_in_bdir`, `cat file_in_bdir` (outputting 'test file'), and `echo hello >> file_in_bdir`.

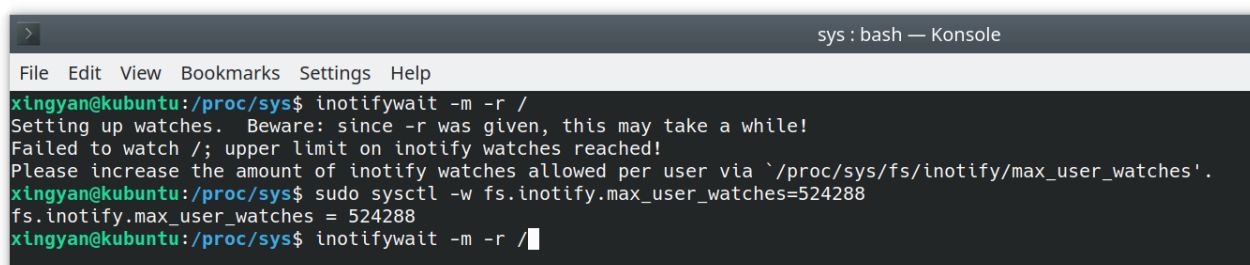
```
> ~ : inotifywait — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~$ inotifywait -m -r ~/watched/
Setting up watches. Beware: since -r was given, this may take a while!
Watches established.
/home/xingyan/watched/b-dir/ OPEN file_in_bdir
/home/xingyan/watched/b-dir/ ACCESS file_in_bdir
/home/xingyan/watched/b-dir/ CLOSE_NOWRITE,CLOSE file_in_bdir
/home/xingyan/watched/b-dir/ OPEN file_in_bdir
/home/xingyan/watched/b-dir/ MODIFY file_in_bdir
/home/xingyan/watched/b-dir/ CLOSE_WRITE,CLOSE file_in_bdir
█

> b-dir : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:~/watched/b-dir$ vim file_in_bdir
xingyan@kubuntu:~/watched/b-dir$ cat file_in_bdir
test file
xingyan@kubuntu:~/watched/b-dir$ echo hello >> file_in_bdir
xingyan@kubuntu:~/watched/b-dir$ █
```

辛. sudo inotifywait -m -r /

直接使用此指令會跳出錯誤訊息，upper limit on inotify watches reached!

因為直接對跟目錄進行操作，需顯示的訊息量太大，會達到預設的上限，因此需要更改上限，預設為 8192，這裡更改成 524288 後就可以順利執行了，但因為訊息跳動太快，就沒有附上截圖了。



The image shows a terminal window titled 'sys : bash — Konsole'. It shows the user attempting to run `inotifywait -m -r /` and receiving an error: 'Failed to watch /; upper limit on inotify watches reached!'. The user then increases the limit using `sudo sysctl -w fs.inotify.max_user_watches=524288`, which is confirmed by the output `fs.inotify.max_user_watches = 524288`. Finally, the user successfully runs `inotifywait -m -r /`.

```
> sys : bash — Konsole
File Edit View Bookmarks Settings Help
xingyan@kubuntu:/proc/sys$ inotifywait -m -r /
Setting up watches. Beware: since -r was given, this may take a while!
Failed to watch /; upper limit on inotify watches reached!
Please increase the amount of inotify watches allowed per user via '/proc/sys/fs/inotify/max_user_watches'.
xingyan@kubuntu:/proc/sys$ sudo sysctl -w fs.inotify.max_user_watches=524288
fs.inotify.max_user_watches = 524288
xingyan@kubuntu:/proc/sys$ inotifywait -m -r /█
```