

系統程式設計

Lab3 File Attributes

學號:405410117

姓名:郭紘安

I. How do you modify fig4_22.c?

■ There are some error messages, and you should modify your code.

- Error message:
can't read directory pathname: Permission denied
- Hint: you can use chmod function to change the permissions of the directory.

會發生

can't read directory /tmp/andy/fileY4bCh/Test2/: Permission denied

can't read directory /tmp/andy/fileY4bCh/Test1/: Permission denied

是因為

d-w-r-xr-x 2 andy andy 4096 May 1 06:44 Test1/

d-w-r-xr-x 2 andy andy 4096 May 1 06:44 Test2/

因為 Test1 and Test2 沒有 read and search 的權限

所以要在 opendir() fail 時用 chmod() 加入 read and search 的權限

```
if ((dp = opendir(fullpath)) == NULL) /* can't read directory */
{
    chmod(fullpath, S_IRUSR|S_IWUSR|S_IXUSR);
    dp = opendir(fullpath);
    //      return(func(fullpath, &statbuf, FTW_DNR));
}
```

就可解決 Permission denied 的問題

■ Count total size of all files

```
20 off_t total_size;
21 int valid = 0;
22 int invalid = 0;

static int myfunc(const char *pathname, const struct stat *statptr, int type)
{
    char *linkname;
    linkname = malloc((statptr->st_size) + 1);
    DEBUG("pathname=%s type=%d\n", pathname, type);
    total_size = total_size + statptr->st_size;

    printf("type=%d size=%d\n", type, statptr->st_size);
    switch (type) {
        case FTW_F:
```

在 myfunc()裡將 struct stat 裡的 st_size 加總起來

■ Check if the symbolic link is valid.

- Valid Link: The target file does exist.
- Invalid Link: The target file doesn't exist.
- Hint: you can use readlink and access functions to check valid link

```
linkname = malloc((statptr->st_size) + 1);
readlink(pathname, linkname, (statptr->st_size) + 1);
if(access(linkname, F_OK) == 0)
    valid++;
else
    invalid++;
```

用 readlink Open the link and read the name in the link，再用 access()判斷檔案是否存在(F_OK : test for existence of file)

II. The count of the various types of files?

Ex: File type = Count, Percentage

```
regular files    =      53, 80.30 %  
directories       =       5,  7.58 %  
block special   =       0,  0.00 %  
char special    =       0,  0.00 %  
FIFOs           =       5,  7.58 %  
symbolic links  =       3,  4.55 %  
sockets         =       0,  0.00 %
```

III. The count of total files size?

Ex: Total size = Size

```
/tmp/andy/file07GUAz 4096  
/tmp/andy/file07GUAz/Test5 4096  
/tmp/andy/file07GUAz/testLink1 26  
/tmp/andy/file07GUAz/testLink2 26  
/tmp/andy/file07GUAz/Test2 4096  
/tmp/andy/file07GUAz/Test1 4096  
/tmp/andy/file07GUAz/Test3 4096  
/tmp/andy/file07GUAz/testLink3 26
```

```
Total size = 20558
```

IV. (Bonus) The count of valid and invalid link?

Ex:

Valid link = Count

Invalid link = Count

```
valid = 2  
invalid = 1
```