基本：

echo

```
else if(!strcmp(d,"echo"))
{
        split = " \n";
        d = strtok(NULL,split);
        if(!strcmp(d,"$PATH"))
        {
                char* env;
                env = getenv("PATH");
                printf("PATH: %s\n",env);
        }
        else
        {
                printf("%s\n",d);
        }
}
```

```
cs4108033007@cs4108033007-VirtualBox:~$ ./hw1
myshell:$ echo 12fmkwl wkflm
12fmkwl
myshell:$
```

pwd

```
else if(!strcmp(d,"pwd"))
{
        char buf[100];
        printf("%s\n",getcwd(buf,sizeof(buf)));
}
```

```
myshell:$ pwd
/home/cs4108033007
```

cd

```
else if(!strcmp(d,"cd"))
{
        split = "\n";
        d = strtok(NULL,split);
        chdir(d);
}
```

```
myshell:$ cd HIHI
myshell:$ pwd
/home/cs4108033007/HIHI
```

export

```c
if(!strcmp(d,"export"))
{
        split = "PATH=$PATH";
        d = strtok(NULL,split);
        //printf("%s\n", d);
        setenv("PATH",d,1);

        printf("PATH: %s\n",getenv("PATH"));
}
```

```
cs4108033007@cs4108033007-VirtualBox:~$ ./hw1
myshell:$ ls
1~          Documents  hw1    mult          Pictures  st          Videos
bin         Downloads  hw1.c  Music         Public    Templates
Desktop  HIHI          lab11  new.backups   pw        tmp
myshell:$  export PATH=$PATH:/abc
PATH: :/abc
myshell:$ ls
myshell:$
```

ls ls-l

```c
else
{
        pid_t pid;
        pid = fork();
        if(pid<0)
        {
                printf("fork error\n");
        }
        else if(pid ==0)
        {
                char *cmd = d;
                char *argv[3];
                argv[0]=d;

                d = strtok(NULL,split);
                argv[1]=d;
                argv[2]=NULL;
                execvp(cmd,argv);
        }
        else
        {
                wait(NULL);
        }
}
```

```
myshell:$ ls
1~          Documents  hw1    mult          Pictures  st          Videos
bin         Downloads  hw1.c  Music         Public    Templates
Desktop  HIHI          lab11  new.backups   pw        tmp
myshell:$ ls -l
total 80
-rw-r--r-- 1 cs4108033007 cs4108033007      0 四  18  2021 1~
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 六   7 18:12 bin
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Desktop
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 四  12  2021 Documents
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Downloads
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 四  26  2021 HIHI
-rwxrwxr-x 1 cs4108033007 cs4108033007  12992 十二  1 23:34 hw1
-rw-rw-r-- 1 cs4108033007 cs4108033007   1505 十二  1 23:34 hw1.c
drwxrwxr-x 2 cs4108033007 cs4108033007   4096 十二  1 21:45 lab11
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 六   7 17:20 mult
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Music
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 五  10  2021 new.backups
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Pictures
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Public
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 六   7 16:36 pw
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 六   7 17:06 st
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Templates
lrwxrwxrwx 1 cs4108033007 cs4108033007      4 五  24  2021 tmp -> /tmp
drwxr-xr-x 2 cs4108033007 cs4108033007   4096 二  23  2021 Videos
myshell:$
```

進階：

查詢歷史 command

```c
if(strlen(input)!=0)
{
        add_history(input);
}
```

```
cs4108033007@cs4108033007-VirtualBox:~$ ./hw1
myshell:$ echo 124134
124134
myshell:$ echo klnf4  441
klnf4
myshell:$ echo 124134
124134
myshell:$ ls
1~       Documents hw1    mult        Pictures  st         Videos
bin      Downloads hw1.c  Music       Public    Templates
Desktop  HIHI      lab11  new.backups pw        tmp
myshell:$ echo 124134
```

能進行 background execution

```c
if(strchr(input,'&'))
{       bgflag=1;
        int index=0;
        for(int i=0;i<strlen(input);i++)
        {
                if(input[i]=='&')
                {
                        index=i;
                }
        }
        char *newinput;
        strncpy(newinput,input,index-1);
        //printf("%s\n",newinput);
}

else
{
        pid_t pid;
        pid = fork();
        if(pid<0)
        {
                printf("fork error\n");
        }
        else if(pid ==0)
        {

                char *cmd = d;
                char *argv[3];
                argv[0]=d;

                d = strtok(NULL,split);
                argv[1]=d;
                argv[2]=NULL;
                //printf("-%s-%s-\n",cmd,argv[1]);
                execvp(cmd,argv);

        }
        else
        {
                if(bgflag==0)
                {
                        wait(NULL);
                }
```

```
myshell:$ sleep 8 &
myshell:$ █
```
背景執行會直接讓使用者輸入下個指令

```
myshell:$ sleep 8
```

要等他 8 秒