

INPUT/OUTPUT & FILE

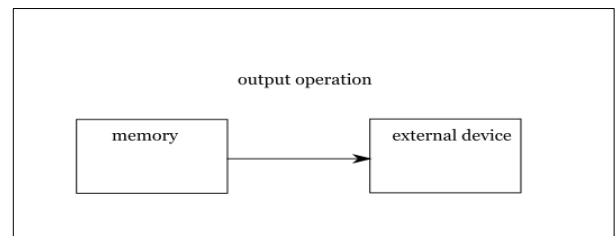
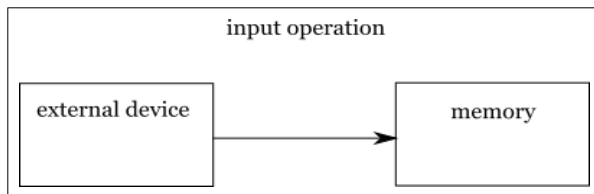
Input/Output (I/O)

What is Input/Output

Input/Output (I/O) is the process of copying data between memory and external devices such as disk drivers, terminals and networks.

Input operation copies data from an external device to memory.

Output operation copies data from memory to external device.



File

What is File

File is a sequence of bytes.

File Category

To show file category, we use command: **ls -l**

The first column represents file category and permission. We call the first character of the column is prefix.

Linux has three basic types of files:

- Regular File

Contains data, text or program instructions.

Prefix: -cd

```
invistd@server:~/dev$ cd ~/share
invistd@server:~/share$ ls -l
total 9
-rwxrwxrwx 1 root root 8168 Nov 19 11:10 demo
-rwxrwxrwx 1 root root  51 Nov 19 04:43 demo.c
```

- Directory

Contains a list of other files.

Prefix: d

```
total 4
drwxrwxrwx 1 root root 4096 Nov 19 11:10 share
invistd@server:~$
```

- Device File

Used to interact with external devices.

Prefix: b,c,p,s

```
crw-rw---- 1 root input 13, 69 Nov 19 03:44 event5
crw-rw---- 1 root input 13, 70 Nov 19 03:44 event6
crw-rw-r-- 1 root input 13,  0 Nov 19 03:44 js0
crw-rw-r-- 1 root input 13,  1 Nov 19 03:44 js1
crw-rw---- 1 root input 13, 63 Nov 19 03:44 mice
crw-rw---- 1 root input 13, 32 Nov 19 03:44 mouse0
```

Device File

What is Device File

All I/O devices, such as networks, disks, terminals are mapped and modeled as files. That is called device file.

Where is Device File

Device files are located in folder `/dev`.

Device File Category

If the first character is **b**, **c**, **p**, or **s**, the file is a device.

The meaning of characters:

- *Character device (c)*

Driver communicates with hardware by sending and receiving characters (bytes, octets).

- *Block device (b)*

Driver communicates with hardware by sending and receiving entire blocks of data.

- *Pipe device (p)*

Like character device, pipe message is character. But, its endpoint is an I/O stream instead of a kernel driver.

- *Socket device (s)*

Special interfaces that are used for interprocess communication.

