

LPI Essentials Chapter 8 — Standard I/O and Filter Commands

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① Standard I/O

- Available Channels

- Redirection of Channels

- Command Pipes

② Command Line Helpers

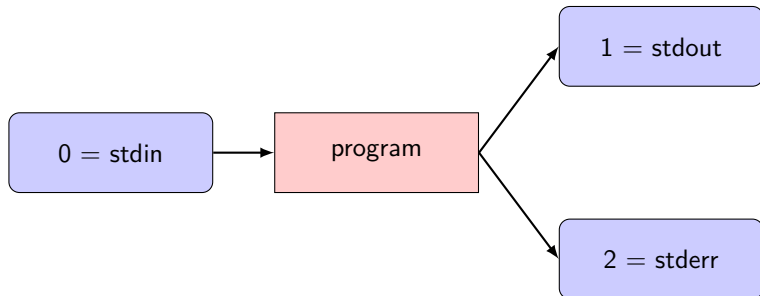
- `tee`

- `cat, head, tail`

- `sort, uniq`

- `cut, paste`

Available Channels



stdin can be: keyboard, file, stdout of another program

stdout can be: /dev/tty, /dev/null, file, stdin of another program

Redirection of Channels

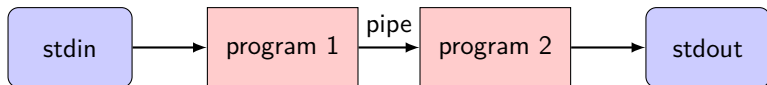
command	description	example
>, 1>	redirect stdout	make >make.log
2>	redirect stderr	make 2>make.err
>> file	append stdout to file	make >> make.log
<, 0<	redirect stdin	wc -l < thesis.tex
x>&y	redirect channel x to y	make >make.log 2>&1
'command'	insert stdout of command	for i in 'seq 5'; do ...

Note: order is important!

```
1 make >make.log 2>\&1 # 1 := make.log, 2 := 1 (= make.log)
2 make 2>\&1 >make.log # 2 := 1 (= /dev/tty), 1 := make.log
```

Command Pipes

Redirect the output of a program to the stdin of another program.

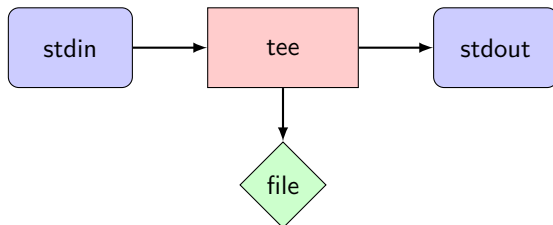


Example:

```
1 ls -l . | grep "\.tex"
```

Command Line Helpers — tee

tee writes stdin to stdout and to file



Example:

```
1 ls -l . | tee liste | less
```

Command Line Helpers — cat, head, tail

cat – concatenate multiple text files

```
1 cat *.txt > combined.txt
```

head, tail – print begin and end of file

```
1 tail -n 5 file # prints last 5 lines of file  
2 head -n 5 file # prints first 5 lines of file
```

Trick: watch tail of file

```
1 ./program > output & # start time consuming program  
2 tail -f output      # print recently appended lines
```

Command Line Helpers — sort

sort – sort lines in file or stdin

```
1 $ w -h | sort # sort according to first letters
2 avoigt pts/1 pkts06.phy.tu-dr 19:10 0.00s 0.11s
3 cgumpert pts/18 pkts04.phy.tu-dr 12Sep12 10days 0.39s
4 crudolph pts/11 pktw96.phy.tu-dr 04Sep12 27:19m 6.01s
5 diessner pts/0 pktw31.phy.tu-dr 03Sep12 10days 4.49s
6 felix pts/6 pkts06.phy.tu-dr 06Sep12 14days 0.86s
7 hasterok pts/4 pktw73.phy.tu-dr 05Sep12 8days 0.97s
8 morgenst pts/12 pktw93.phy.tu-dr 29Aug12 4:06m 2.97s
```

```
1 $ w -h | sort -k 6 # sort according to 6th row (JCPU)
2 avoigt pts/1 pkts06.phy.tu-dr 19:10 0.00s 0.11s
3 cgumpert pts/18 pkts04.phy.tu-dr 12Sep12 10days 0.39s
4 felix pts/6 pkts06.phy.tu-dr 06Sep12 14days 0.86s
5 hasterok pts/4 pktw73.phy.tu-dr 05Sep12 8days 0.97s
6 morgenst pts/12 pktw93.phy.tu-dr 29Aug12 4:07m 2.97s
7 diessner pts/0 pktw31.phy.tu-dr 03Sep12 10days 4.49s
8 crudolph pts/11 pktw96.phy.tu-dr 04Sep12 27:20m 6.01s
```


Command Line Helpers — uniq

uniq – replace identical sequenced lines by one

```
1 $ cat file.txt
2 aa
3 aa
4 bb
5 bb
6 aa
7 bb
```

```
1 $ uniq file.txt
2 aa
3 bb
4 aa
5 bb
```

```
1 $ sort file.txt | uniq # same as 'sort -u file.txt'
2 aa
3 bb
```

Command Line Helpers — cut columns

cut – cut columns from a file or stdin

```
1 $ w -h | sort
2 avoigt pts/1 pkts06.phy.tu-dr 19:10 0.00s 0.11s
3 cgumpert pts/18 pkts04.phy.tu-dr 12Sep12 10days 0.39s
4 crudolph pts/11 pktw96.phy.tu-dr 04Sep12 27:19m 6.01s
5 diessner pts/0 pktw31.phy.tu-dr 03Sep12 10days 4.49s
6 felix pts/6 pkts06.phy.tu-dr 06Sep12 14days 0.86s
7 hasterok pts/4 pktw73.phy.tu-dr 05Sep12 8days 0.97s
8 morgenst pts/12 pktw93.phy.tu-dr 29Aug12 4:06m 2.97s
```

```
1 $ w -h | sort | cut -c 1-8,18-25 # cut columns 1-8 and 18-25
2 avoigt pkts06.
3 cgumpert pkts04.
4 crudolph pktw96.
5 diessner pktw31.
6 felix pkts06.
7 hasterok pktw73.
8 morgenst pktw93.
```

Command Line Helpers — cut fields

```
1 $ cat /etc/passwd
2 root:x:0:0:root:/root:/bin/bash
3 bin:x:1:1:bin:/bin:/sbin/nologin
4 daemon:x:2:2:daemon:/sbin:/sbin/nologin
5 adm:x:3:4:adm:/var/adm:/sbin/nologin
6 lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
7 sync:x:5:0:sync:/sbin:/bin/sync
8 shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
9 halt:x:7:0:halt:/sbin:/sbin/halt
10 mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
11 news:x:9:13:news:/etc/news:
```

```
1 $ cat /etc/passwd | cut -d: -f 1,7 # cut field 1 and 7
2 root:/bin/bash
3 bin:/sbin/nologin
4 daemon:/sbin/nologin
5 adm:/sbin/nologin
6 lp:/sbin/nologin
7 sync:/bin/sync
8 shutdown:/sbin/shutdown
9 halt:/sbin/halt
10 mail:/sbin/nologin
11 news:
```

Command Line Helpers — paste

paste – merge files line by line

```
1 $ cat file1.txt
2 a
3 b
4 c
5 $ cat file2.txt
6 x
7 y
8 z
```

```
1 $ paste -d: file1.txt file2.txt
2 a:x
3 b:y
4 c:z
```