Pipelines

```
$ wc /etc/motd # Count lines, words, characters        wc: /etc/motd: No such file or directory
   7  40 286 /etc/motd
$ ls /etc >files
$ wc -l <files
203
$ ls /etc | wc -l
203
$ ls /usr | cat -n
     1  bin
     2  games
     3  home
     4  include
     5  lib
     6  lib32
     7  local
     8  sbin
     9  share
    10  src
    11  var
$
```

Exit code

```
$ wc /etc/motd # Run a command that succeeds
   7  40 286 /etc/motd
$ echo $? # Print exit status (zero)
0
$ wc xyzzy # Run a command that fails
wc: xyzzy: No such file or directory
$ echo $? # Print exit status (non-zero)
1
$
```

The and operator &&

```
$ touch a-file
$ cat -n a-file >b-file && rm a-file # Execute second only if first succeeds
$ ls
b-file
$ cat -n bfile >cfile && rm b-file # Note typo; command will fail
cat: bfile: No such file or directory
$ ls
b-file  cfile
$
```

The or operator ||

```
$ touch a-file
$ cp a-file b-file || echo Copy failed # Command that succeeds
$ cp afile bfile || echo Copy failed # Note typo
cp: cannot stat 'afile': No such file or directory
Copy failed
$
```

The negation operator !

```
$ ! date # Command that succeeds
Fri 21 Feb 2020 01:11:49 PM EET
$ echo $?
1
```

```
$ ! ls xyzzy # Command that fails
ls: cannot access xyzzy: No such file or directory
$ echo $?
0
$
```

Command grouping

```
$ echo -n 'Today is: ' ; date # Execute two commands in a row
Today is: Fri 21 Feb 2020 01:05:31 PM EET
$ { echo -n 'Today is: ' ; date ; } >timestamp # Redirect output of both
$ cat timestamp
Today is: Fri 21 Feb 2020 01:05:35 PM EET
$ { echo -n 'Today is: ' ; date ; } | wc -c # Pipe output of both
39
$ { # Group on multiple lines
>   echo -n 'Today is: '
>   date
> }
Today is: Fri 21 Feb 2020 01:05:42 PM EET
$
```