



UNIX for Programmers and Users

- **SEQUENCES**

If you enter a series of simple commands or pipelines separated by semicolons, the shell will execute them in sequence, from left to right.

This facility is useful for type-ahead(and think-ahead) addicts who like to specify an entire sequence of actions at once.

Here's an example:

```
$ date; pwd; ls ---> execute three commands in sequence.  
Wednesday August 24 11:40:55 2016  
/home/glass/wild  
a.c  b.c  cc.c  dir1  dir2  
$ _
```

- Each command in a sequence may be individually I/O redirected as well:

```
$ date > date.txt; ls; pwd > pwd.txt
```

```
a.c      b.c      cc.c      date.txt      dir1      dir2
```

```
$ cat date.txt
```

```
Wednesday August 24 11:40:55 2016
```

```
$ cat pwd.txt      ---> look at output of pwd.
```

```
/home/glass
```

```
$ _
```

- **Conditional Sequences**

- Every UNIX process terminates with an exit value.
an exit value of 0 --> process completed successfully
a nonzero exit value --> failure
 - All built-in shell commands return a value of 1 if they fail.
- 1) Commands are separated by "&&" tokens
 - 2) Commands are separated by "||" tokens

- For example,
 - if the C compiler `cc` compiles a program without fatal errors, it creates an executable program called `"a.out"` and returns an exit code of 0;
 - otherwise, it returns a nonzero exit code.

```
$ cc myprog.c && ./a.out
```

- The following conditional sequence compiles a program called `"myprog.c"` and displays an error message if the compilation fails:

```
$ cc myprog.c || echo compilation failed.
```

- **GROUPING COMMANDS**

- Commands may be grouped by placing them between parentheses.
- The group of commands shares the same standard input, standard output, and standard error channels and may be redirected and piped as if it were a simple command.

- Here are some examples:

```
$ date; ls; pwd > out.txt      ---> execute a sequence.  
Wednesday August 24 11:40:55 2016 ---> output from date.  
a.c          b.c             ---> output from ls.  
$ cat out.txt                ---> only pwd was redirected.  
/home/glass
```

```
$ ( date; ls; pwd ) > out.txt  ---> group and then redirect.  
$ cat out.txt                ---> all output was redirected.  
Wednesday August 24 11:40:55 2016  
a.c          b.c  
/home/glass  
$ _
```

- TERMINATION AND EXIT CODES

In the Bash, Bourne and Korn shells, the special shell variable `$?` always contains the value of the previous command's exit code.

In the C shell, the `$status` variable holds the exit code.

-In the following example, the **date** utility succeeded, whereas the **cc** utility failed:

\$ **date** ---> date succeeds.

Mon 29 8 22:13:38 2016

\$ **echo \$?** ---> display its exit value.

0 ---> indicates success.

\$ **cc prog.c** ---> compile a nonexistent program.

cpp: Unable to open source file 'prog.c'.

\$ **echo \$?** ---> display its exit value.

1 ---> indicates failure.

\$ _