Introduction to UNIX (part 2)

EECS 2031

Command Terminators

- Command terminator: new line or **;**

```
% date; who
```

- Another command terminator: &

```
% jedit lab9.c&
```

  - Tells the shell not to wait for the command to complete.
  - Used for a long-running command “in the background” while you continue to use the xterm for other commands.

Command Terminators (cont.)

- Use parentheses to group commands

```
% ( sleep 5; date ) & date
14929       # process ID of long-running command
Tue Nov 9 14:06:15 EST 2010   # output of 2nd date
% Tue Nov 9 14:06:20 EST 2010 # output of 1st date
```

- The precedence of | is higher than that of ;

```
% date; who | wc -l
% (date; who) | wc -l
```

3

tee command

- **tee** copies its input to a file as well as to standard output (or to a pipe).
- **tee** will overwrite an existing file.

```
% date | tee date.out
Tue Nov  9 13:51:22 EST 2010
% cat date.out
Tue Nov  9 13:51:22 EST 2010
% date | tee date.out | wc
       1       6      29
% cat date.out
Tue Nov  9 13:52:49 EST 2010
```

4

Metacharacters

- Most commonly used: *
- Search the current directory for file names in which any strings occurs in the position of *

```
% echo *  # same effect as
% ls *
```

- To protect metacharacters from being interpreted: enclose them in single quotes.

```
% echo '***'
***
```

5

Metacharacters (cont.)

- Or to put a backslash \ in front of each character:

```
% echo \*\*\*
***
```

- Double quotes can also be used to protect metacharacters, but …
- The shell will interpret **$**, **** and `…` inside the double quotes.
- So don't use double quotes unless you intend some processing of the quoted string (see slide 10).

6

Quotes

- Quotes do not have to surround the whole argument.

```
% echo x'*'y    # same as echo 'x*y'
x*y
```

- What's the difference between these two commands?

```
% ls  x*y
% ls 'x*y'
```

7

Program Output as Arguments

- To use the output of a command X as the argument of another command Y, enclose X in back quotes: `**X**`

```
% echo `date`
Tue Nov 9 13:11:03 EST 2010
% date    # same effect as above
Tue Nov 9 13:11:15 EST 2010
% echo date
date
% wc `ls *`
% wc *    # same as above
```

8

Program Output as Arguments (2)

- Single quotes vs. double quotes:

```
% echo The time now is `date`
The time now is Tue Nov 9 13:11:03 EST 2010

% echo "The time now is `date`"
The time now is Tue Nov  9 13:11:15 EST 2010

% echo 'The time now is `date`'
The time now is `date`
```

9

Program Output as Arguments (3)

```
% pwd
/cs/home

% ls | wc -w
26

% echo You have `ls | wc -w` files in the `pwd` directory
You have 26 files in the /cs/home directory
```

10

File/Directory Permissions

Letter	Meaning
u	The **u**ser who owns the file (this means "you.")
g	The **g**roup the file belongs to.
o	The **o**ther users
a	**a**ll of the above (an abbreviation for ugo)

r	Permission to **r**ead the file.
w	Permission to **w**rite the file.
x	Permission to e**x**ecute the file, or, in the case of a directory, search it.

11

Example

```
indigo 354 % ls -l
total 284
drwxr-xr-x   2 utn faculty   4096 Oct 29 21:35 Asg1/
drwx------   2 utn faculty   4096 Sep 19 13:37 Misc/
drwxr-xr-x   3 utn faculty   4096 Nov  7 15:37 Notes/
drwxr-x---  10 utn utn       4096 Nov 11 13:27 Posted_Labs/
drwxr-xr-x   5 utn faculty   4096 Nov  7 15:38 Weekly_Labs/
-rw-r--r--   1 utn faculty   2003 Sep  9 14:10 grade.html
-rw-r--r--   1 utn faculty   4815 Oct 25 20:06 index.html
-rw-r--r--   1 utn faculty   2363 Oct 17 13:35 midterm.html
-rw-r--r--   1 utn faculty   4116 Nov  7 15:44 news.html
-rw-r--r--   1 utn faculty 112755 Sep 30 17:13 schedule.pdf
-rw-r--r--   1 utn faculty   4736 Nov  7 15:51 weekly_labs.html
```

12

chmod Command

```
chmod who+permissions filename # or dirname
chmod who-permissions filename # or dirname
```

Examples:

```
chmod u+x my_script # make file executable
chmod a+r index.html      # for web pages
chmod a+rx Notes          # for web pages
chmod o-rx Notes
chmod o-r index.html
```

13

chmod with Binary Numbers

```
chmod u+x my_script     chmod 700 my_script
chmod a+r index.html    chmod 644 index.html

chmod a+rx Notes        chmod 755 Notes
chmod go-rx Notes       chmod 700 Notes
chmod o-rx Notes        chmod 750 Notes
chmod go-r index.html   chmod 600 index.html
chmod o-r index.html    chmod 640 index.html
```

14

chgrp Command

```
chgrp grp_name filename  # or dirname
```

- Examples:

```
chgrp submit asg1
chgrp labtest lab5
```

- To display the group(s) a user belongs to, use **id** command:

```
% id cse12345
uid=12695(cse12345) gid=10000(ugrad) groups=10000(ugrad)
```

15

Next lecture

- Writing shell scripts
- Reading for this lecture:
  - **chmod** tutorial:
    http://catcode.com/teachmod/

16