

COMPIII

Software Tools



UNIX
Utilities

Getting Started on UNIX

- The machines in CS Lab2 are named `cs12wk01` through `cs12wk41`.
- `cs12wk01` means “CSLab2, workstation#1”
- The full machine name for `cs12wk01` is:
`cs12wk01.cse.ust.hk`





UNIX File Utilities

- `ls` list files in current directory
- `cat` display file
- `more` display one screen of file
- `rm` remove (delete) a file
- `cp` copy source file to target file
- `mv` rename or move a file
- `lpr` print a file
- `man` online UNIX help manual
- `mpage` print multiple pages on postscript printer
(not standard UNIX command; OpenSource command)





UNIX File Utilities - Example

```
$ ls
letter1      secret/
$ cat letter1
Ms. Lewinski:
It is getting late. Please order some pizza and stop
by my office. We'll tidy up a few more things before
calling it a night.
Thanks!
Bill
$ cp letter1 letter2
$ ls
letter1      letter2      secret/
```



File Utilities - Example con't

```
$ mv letter1 letter3
$ ls
letter2      letter3
      secret/

$ lpr -Pc112a letter2
$ mpage -Pc112a letter2
$ rm letter2
$ ls
letter3      secret/
```



```
$ man ls
```

```
Reformatting page.  Wait... done
```

```
User Commands
```

```
ls(1)
```

```
NAME
```

```
ls - list contents of directory
```

```
SYNOPSIS
```

```
/usr/bin/ls [ -aAbcCdFgILmnoPqrRstuxl ] [ file... ]
```

```
/usr/xpg4/bin/ls [ -aAbcCdFgILmnoPqrRstuxl ] [ file... ]
```

```
DESCRIPTION
```

For each file that is a directory, `ls` lists the contents of the directory; for each file that is an ordinary file, `ls` repeats its name and any other information requested. The output is sorted alphabetically by default. When no argument is given, the current directory is listed. When several arguments are given, the arguments are first sorted appropriately, but file arguments appear before directories and their contents.

There are three major listing formats. The default format for output directed to a terminal is multi-column with

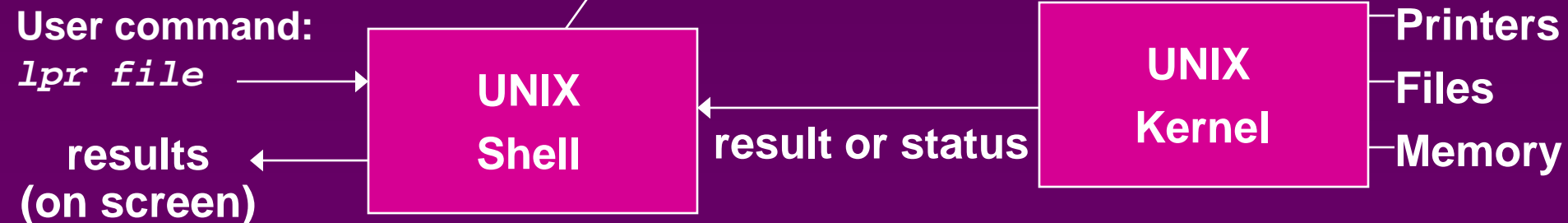
```
--More--(5%)
```

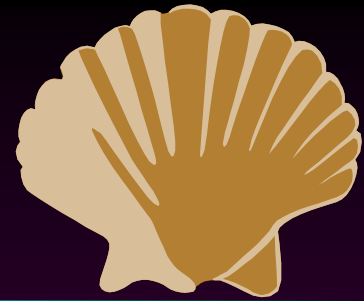




The UNIX Shell

- The UNIX shell listens to what you type and executes commands at your request.





Popular Shells

- sh Bourne shell (the original shell)
- csh C-shell (pronounced as “sea shell”)
- tsch Like csh with more functions (Lab2 default)
- bash “Bourne again” shell
- ksh Korn shell
- zsh Z-shell (not on Lab2 machines)





Finding Info

- who

Who is logged on, where & when

```
$ who
horner pts/0 Jan 29 09:52 (csz469.cs.ust.hk)
gbush pts/1 Jan 29 10:43 (csz213.cs.ust.hk)
```

- finger

A bit more login information

```
$ finger
Login      Name           Tty      Idle      Login Time   Office      Office Phone
horner     Andrew Horner pts/0
gbush     George W      pts/1    121:07    Sep  5 10:18 (csz469.cse.ust.hk)
          Sep  5 09:06 (csz213.cse.ust.hk)
```



Finding Info

- write Send message to another user

```
$ whoami  
horner  
$ write clinton  
Bill, you've been idle for a  
long time! What are you doing?  
[hit CTRL-D to end write message]  
$
```

```
-----  
$ whoami  
clinton
```

```
Message from horner on csz096.cs.ust.hk [ Fri Jan 29 20:18:47 .  
Bill, you've been idle for a  
long time! What are you doing?  
EOF  
$
```



More Utilities

- **echo** Display command line input to screen

```
$ echo Hi, I am Bill, and she's the boss!  
Hi, I am Bill, and she's the boss!
```
- **date** Print the date and time

```
$ date  
Tue Sep 5 12:24:07 HKT 2009
```





More Utilities

- **head** Display first few lines of file

```
$ head -2 letter3
```

Ms. Lewinski:
 It is getting late. Please order some pizza and stop
- **tail** Display last few lines of file

```
$ tail -2 letter3
```

Thanks!
 Bill
- **grep** Find a pattern in a file

```
$ grep "some pizza" letter3
```

It is getting late. Please order some pizza and stop



More Utilities

- `sort` Sort the lines in lexical order

```
$ sort letter3
```

```
Bill
```

```
by my office. We'll tidy up a few more things before  
calling it a night.
```

```
It is getting late. Please order some pizza and stop  
Ms. Lewinski:
```

```
Thanks!
```

```
$ sort -r letter3
```

```
Thanks!
```

```
Ms. Lewinski:
```

```
It is getting late. Please order some pizza and stop  
calling it a night.
```

```
by my office. We'll tidy up a few more things before  
Bill
```



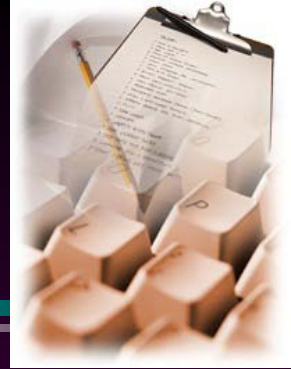
More Utilities

- `uniq` Display file with duplicate adjacent lines removed

```
$ cat names  
George W. Bush  
Bill Gates  
Bill Gates  
Bill Clinton  
George W. Bush  
Barak Obama
```

```
$ uniq names  
George W. Bush  
Bill Gates  
Bill Clinton  
George W. Bush  
Barak Obama
```



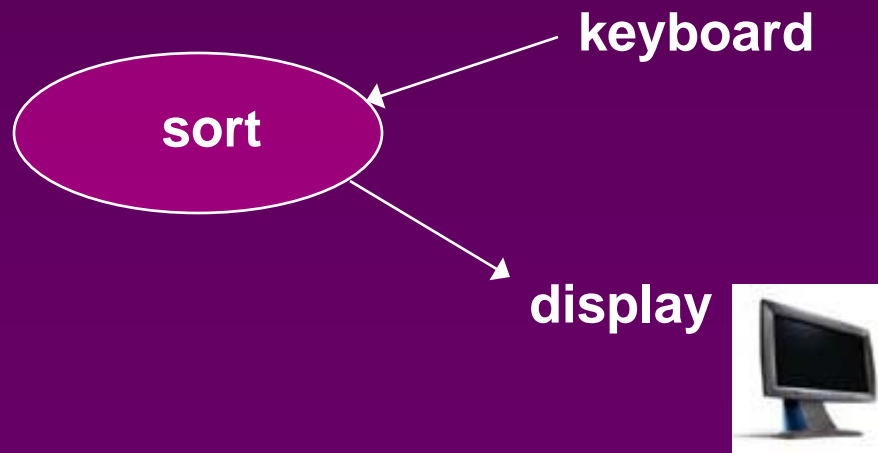


Input/Output Redirection

- On UNIX, the *standard input* (stdin) is the keyboard; the *standard output* (stdout) is the display screen.

```
$ sort
```

waits for you to type in the data from the keyboard and displays the sorted data on the screen.



Input/Output Redirection

- Using the “>” character after a command to redirect output to a named file:

```
$ sort names > names.sort
```

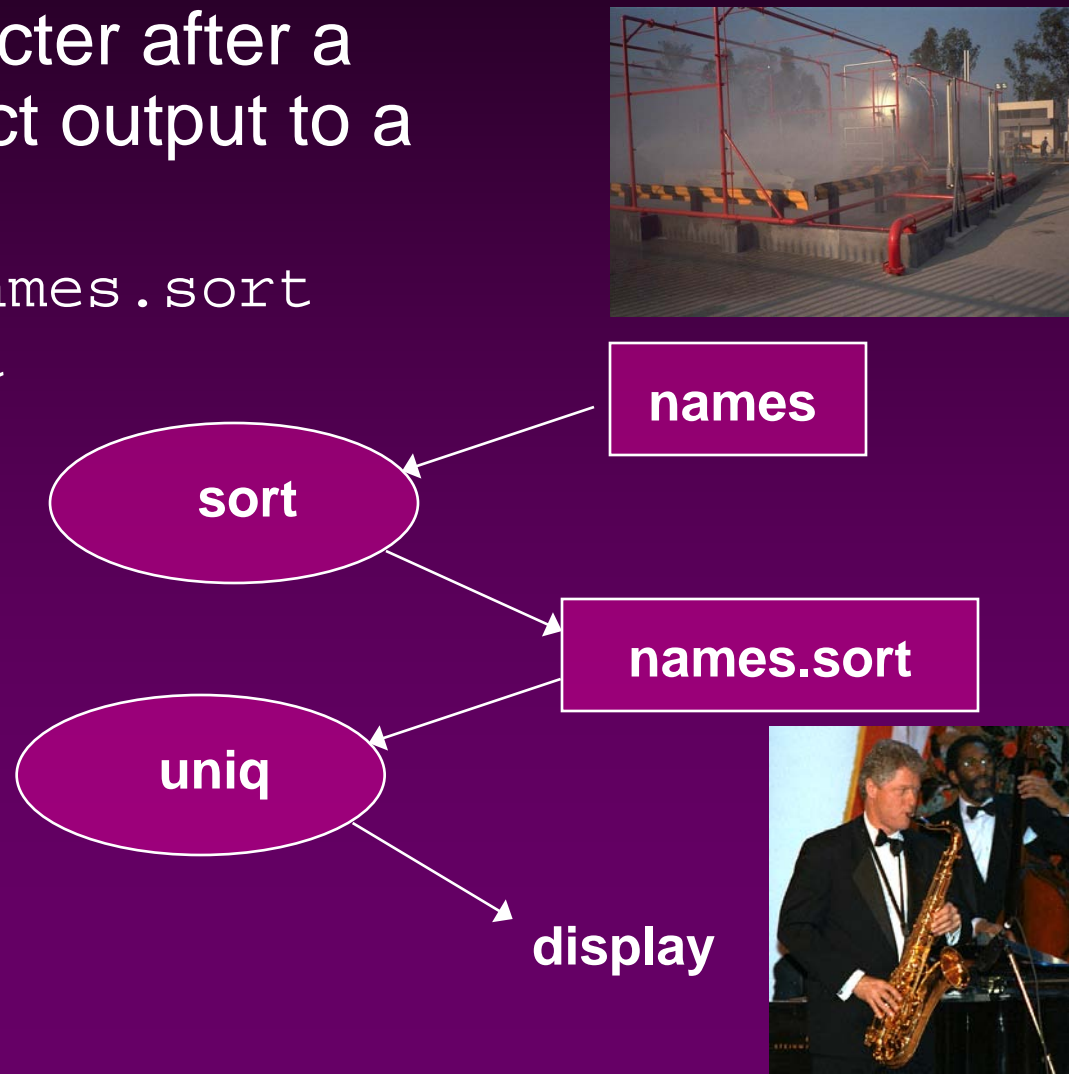
```
$ uniq names.sort
```

Barak Obama

Bill Clinton

Bill Gates

George W. Bush





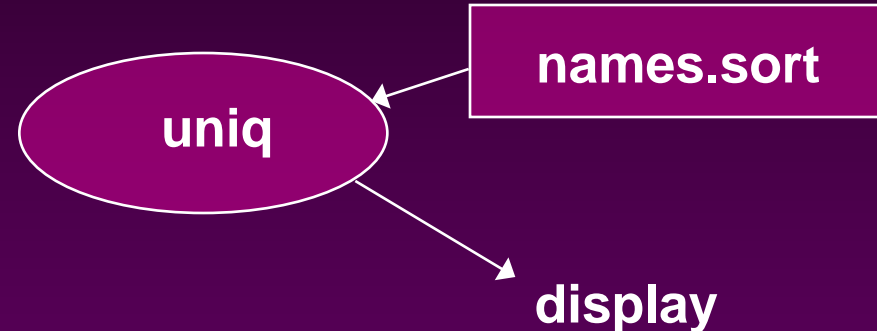
Input/Output Redirection

- Using the “<” character after a command to redirect input from a named file:

```
$ uniq < names.sort
```

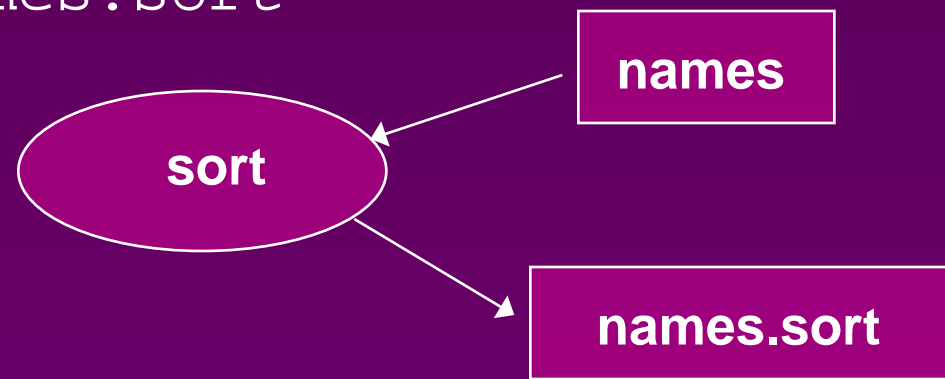
This is the same as:

```
$ uniq names.sort
```



- Using input and output redirection together:

```
$ sort < names > names.sort
```

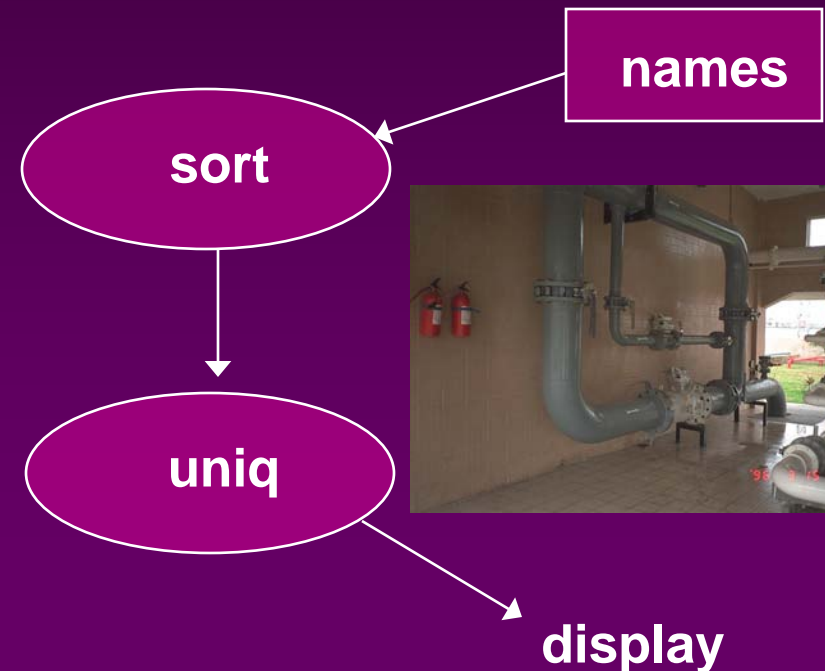


Pipes

- The standard output of a program can be “piped” into the standard input of another program:

```
$ sort names | uniq
```

```
Barak Obama  
Bill Clinton  
Bill Gates  
George W. Bush
```



Pipes

- Several pipes can be connected:

```
$ cat names | sort | uniq
```

Barak Obama

Bill Clinton

Bill Gates

George W. Bush

- Pipes and I/O redirection can be used together:

```
$ sort -r names | uniq >names.rev
```

```
$ cat names.rev
```

George W. Bush

Bill Gates

Bill Clinton

Barak Obama

