Linux For Embedded Systems

For Arabs

Course 102:

Understanding Linux

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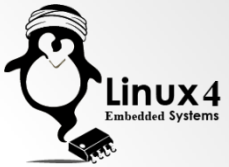
Lecture 7:
Simple Utilities

Advanced Navigation Commands



Command	Effect
$ pushd	To Push Directory (save it for later)
$ popd	To pull Directory (retrieve last pushed one)
$ dirs	To show the stack of pushed directories

Advanced Navigation Commands (pushd & popd Commands)

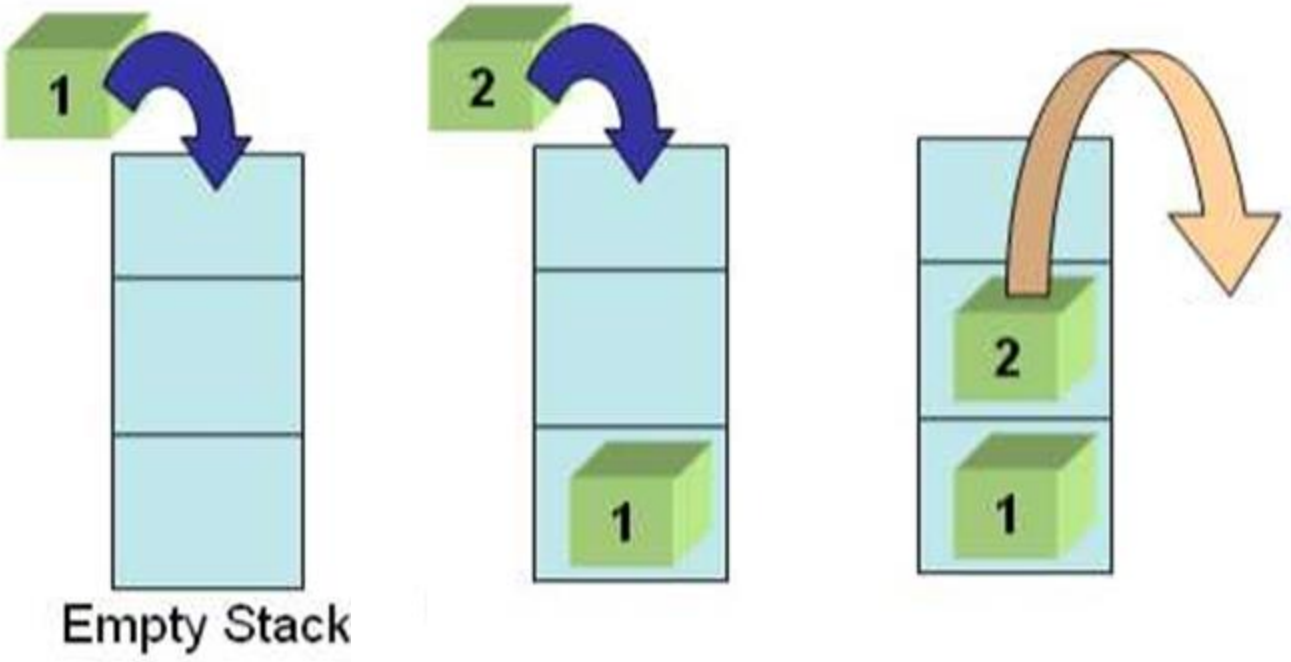
$ pushd <directory path>

$ popd

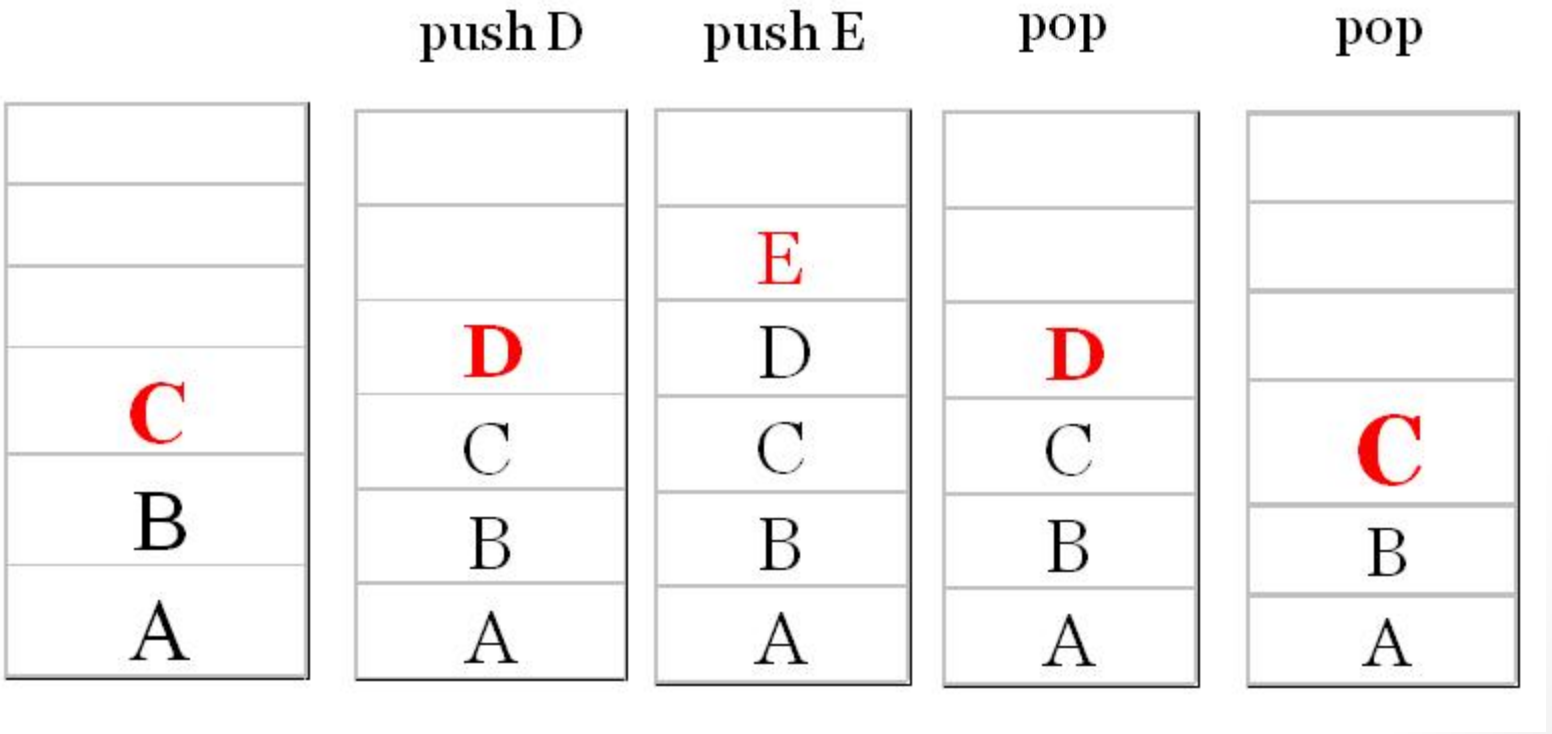
$ dirs

- Linux keeps a stack of directories

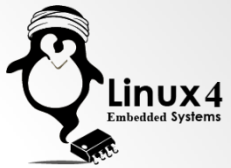
What is a Stack ?



What is a Stack ?



Advanced Navigation Commands (pushd & popd Commands)



Example:

$ pushd /home/tom is equivalent to :

$ cd /home/tom + push the directory "***/home/tom***" to the stack

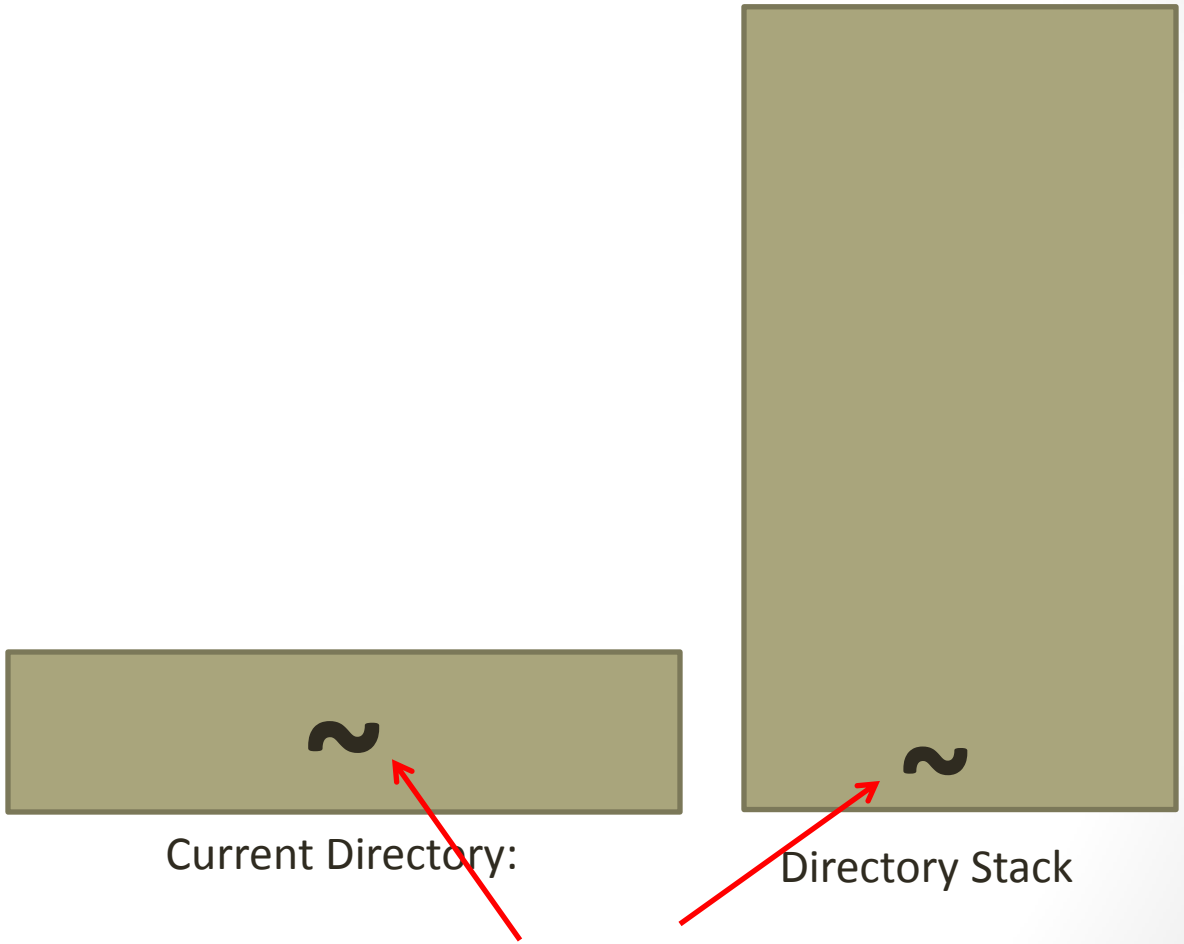
$ popd is equivalent to :

Get the top path from the stack + ***cd <the selected path>***

$ dirs is equivalent to :

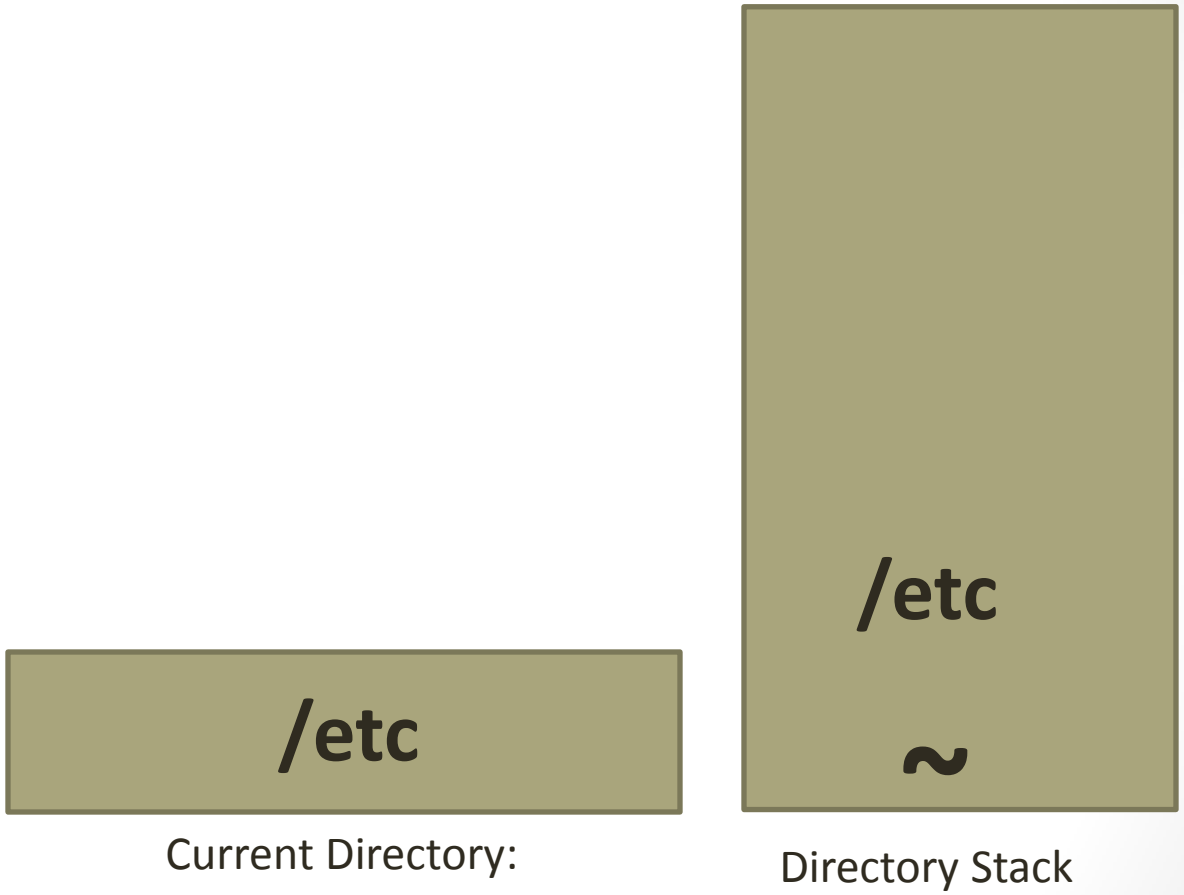
List the contents of the directory stack

Example:


~
~
Current Directory:
Directory Stack
Top of stack is always pointing to the current Directory

Example:

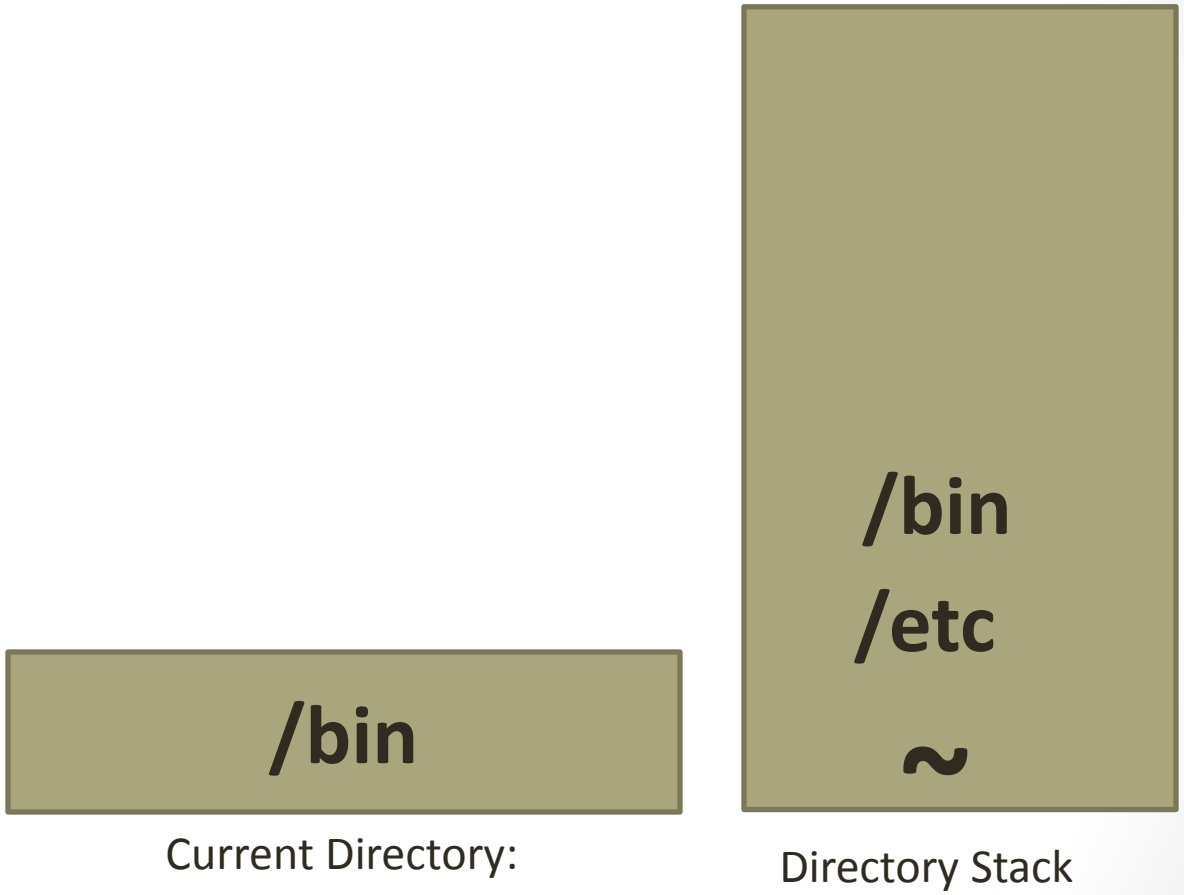
$ pushd /etc



Example:

$ pushd /etc

$ pushd /bin

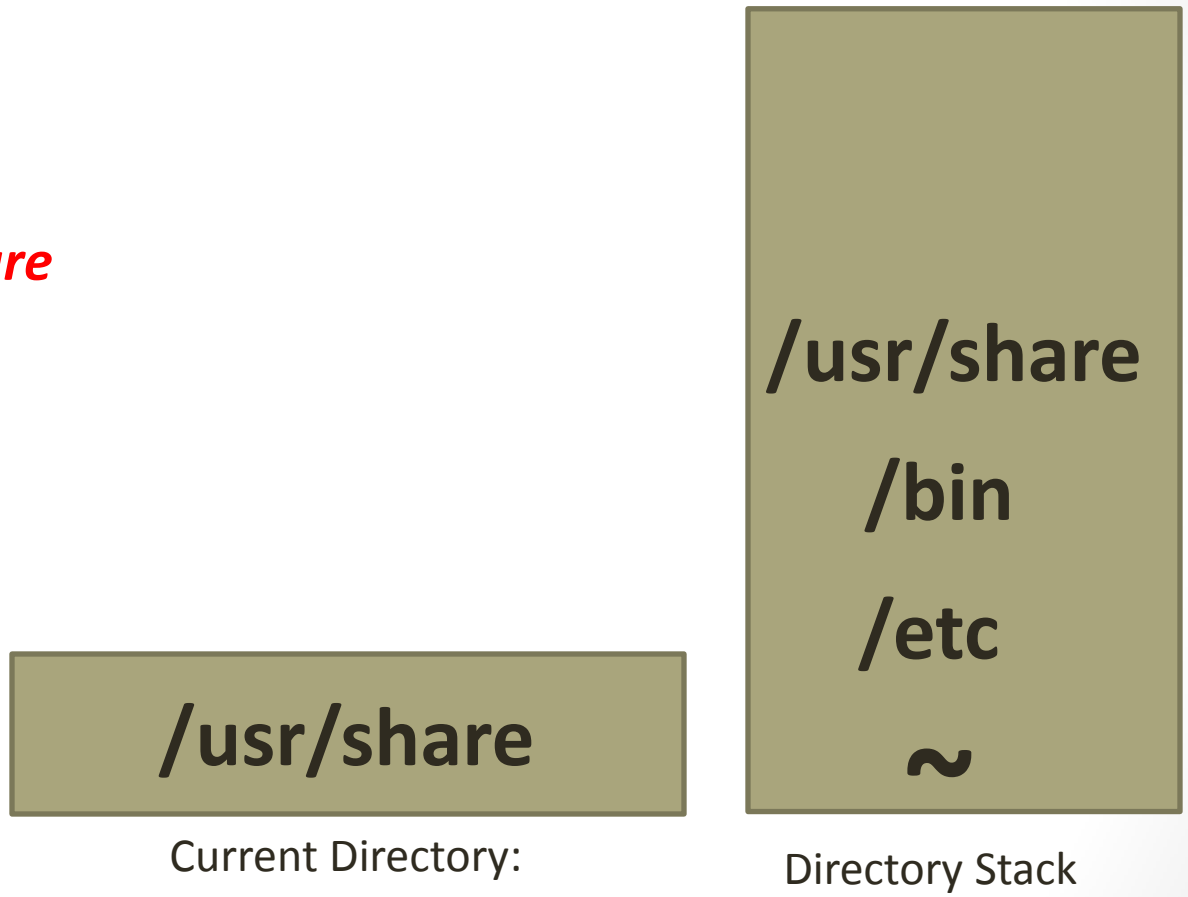


Example:

$ pushd /etc

$ pushd /bin

$ pushd /usr/share



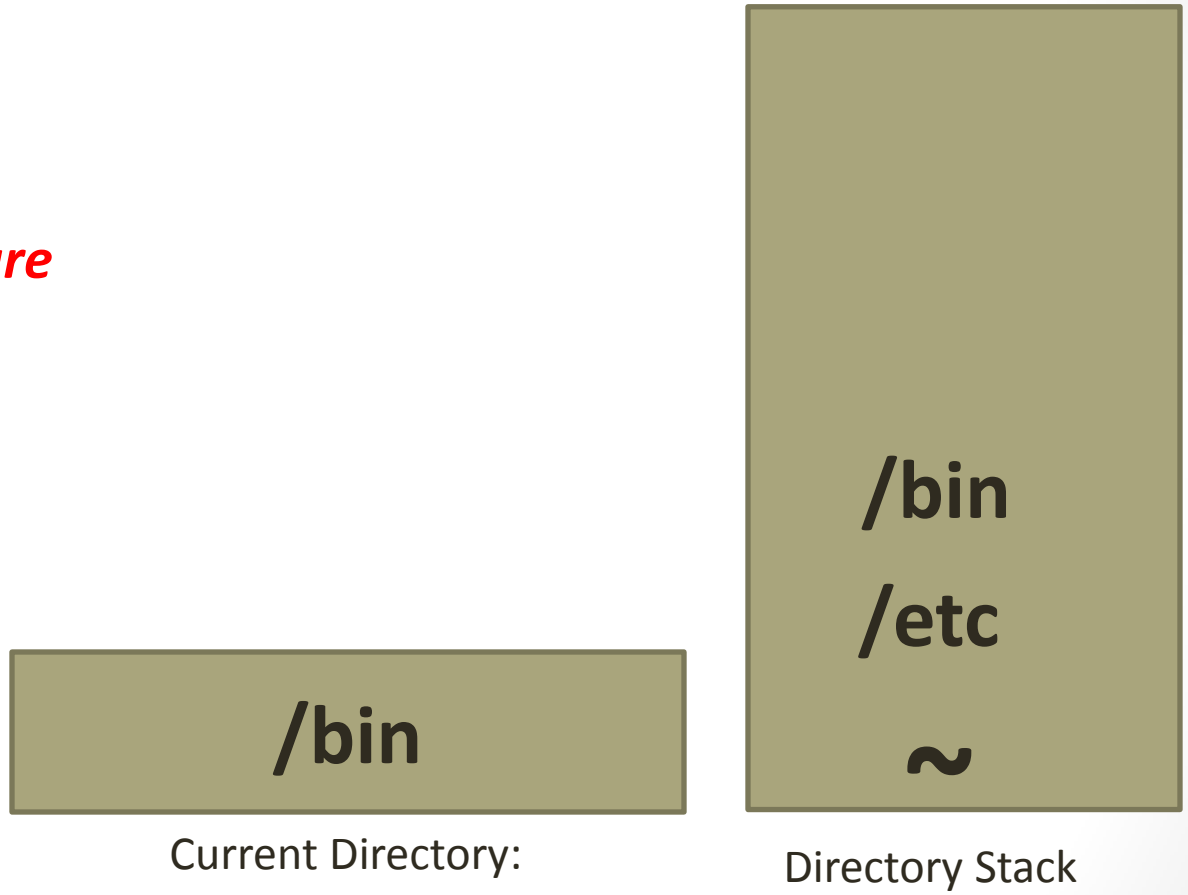
Example:

$ pushd /etc

$ pushd /bin

$ pushd /usr/share

$ popd



Example:

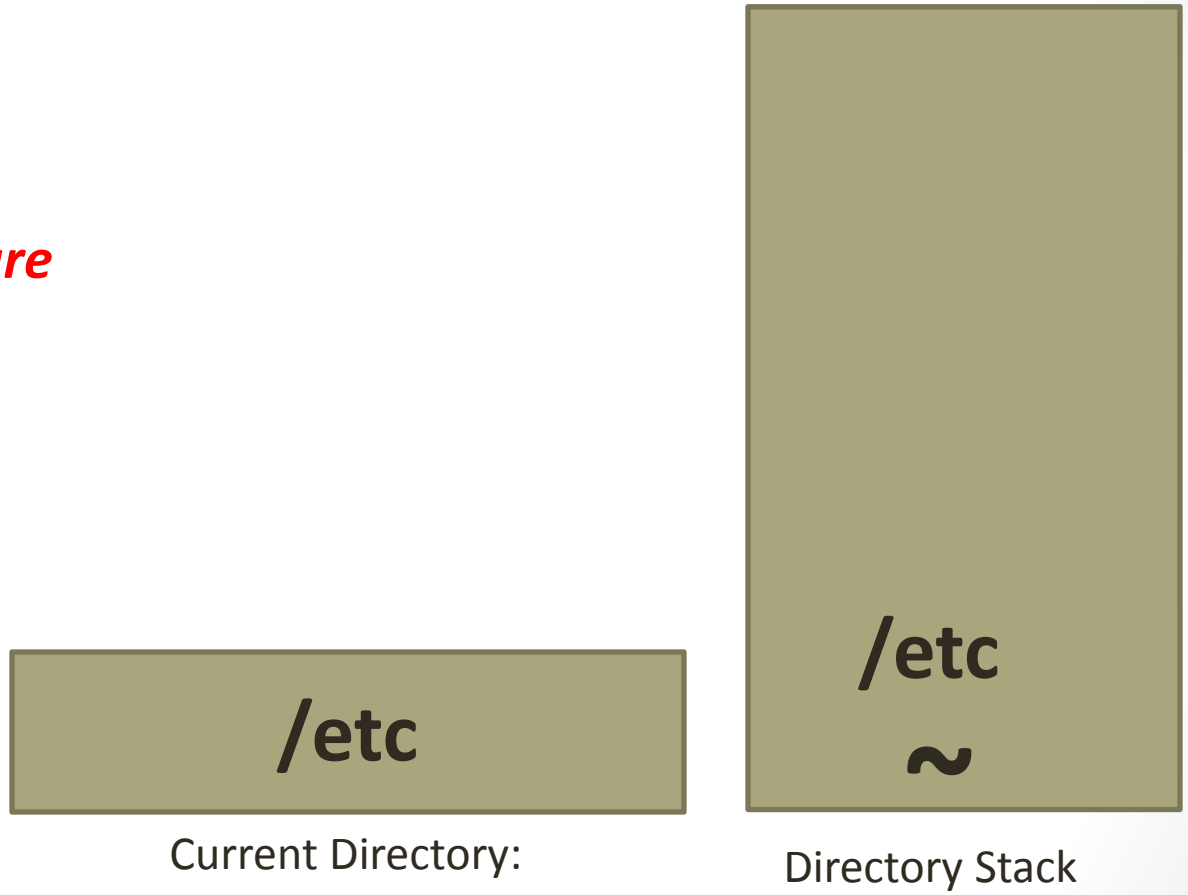
$ pushd /etc

$ pushd /bin

$ pushd /usr/share

$ popd

$ popd



Example:

$ pushd /etc

$ pushd /bin

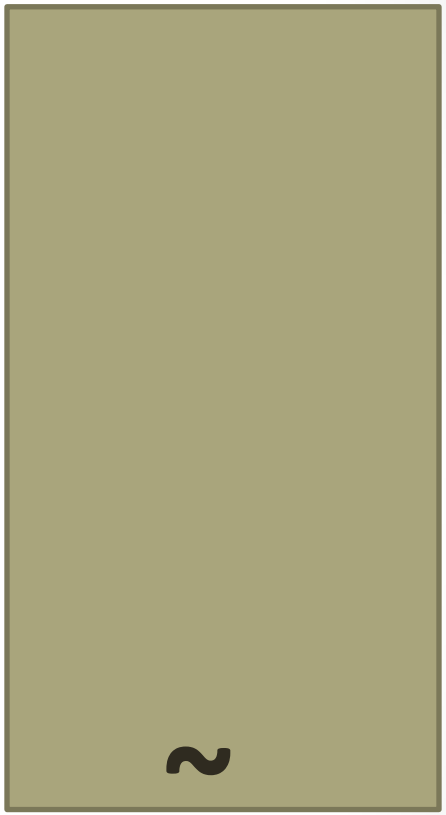
$ pushd /usr/share

$ popd

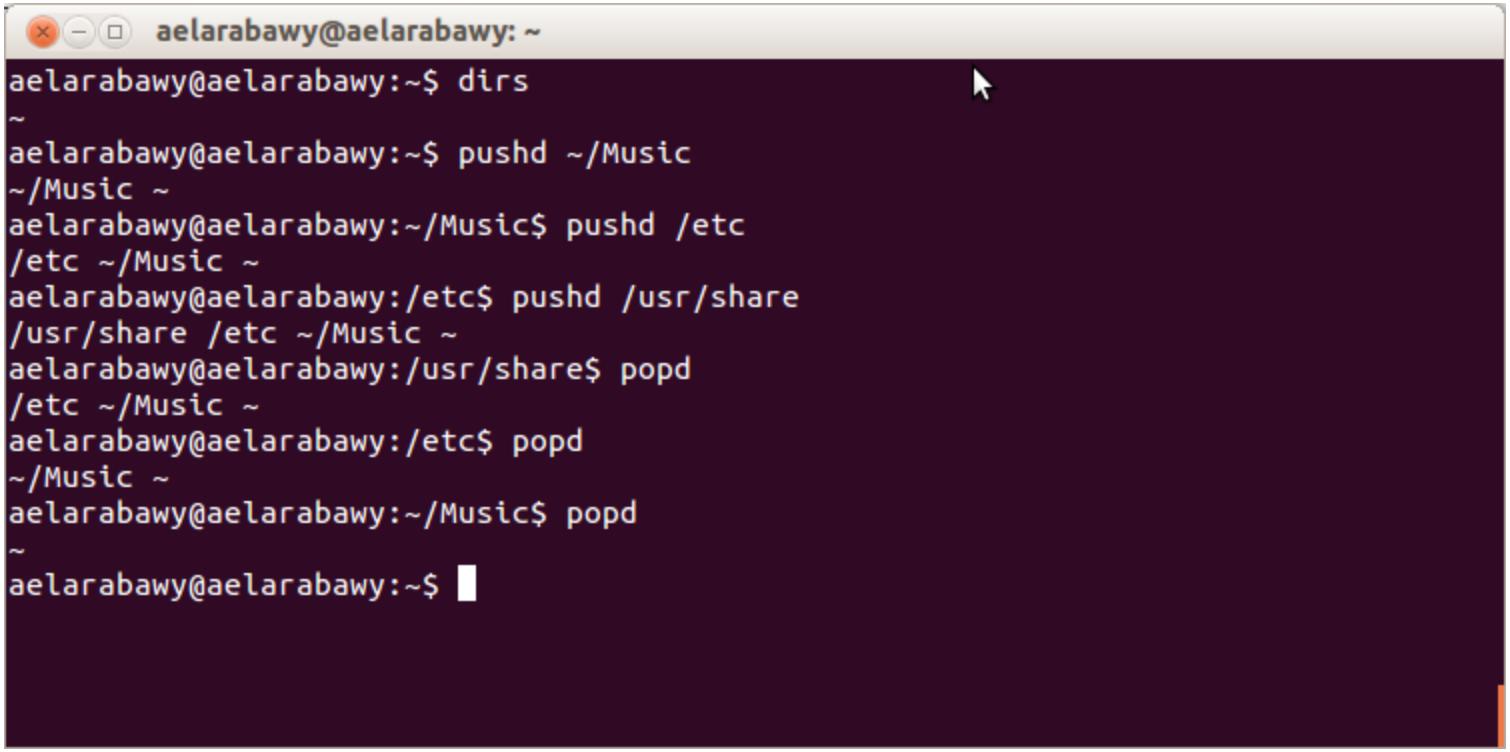
$ popd

$ popd

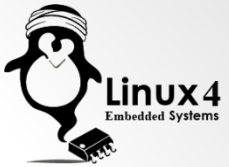
Current Directory:



Directory Stack


aelarabawy@aelarabawy: ~
aelarabawy@aelarabawy:~$ dirs
~
aelarabawy@aelarabawy:~$ pushd ~/Music
~/Music ~
aelarabawy@aelarabawy:~/Music$ pushd /etc
/etc ~/Music ~
aelarabawy@aelarabawy:/etc$ pushd /usr/share
/usr/share /etc ~/Music ~
aelarabawy@aelarabawy:/usr/share$ popd
/etc ~/Music ~
aelarabawy@aelarabawy:/etc$ popd
~/Music ~
aelarabawy@aelarabawy:~/Music$ popd
~
aelarabawy@aelarabawy:~$

Simple Commands and Utilities



Command	Effect
$ echo	Display a line of text
$ cat	Display text file(s)
$ date	Shows the date
$ cal $ ncal	Shows the calendar
$ bc	Basic calculator
$ hostname	Get the machine name
$ uname	Print System Information
$ uptime	Get the System up-time
$ reboot	Reboot the machine (must be root)

Display a Line of Text (echo Command)

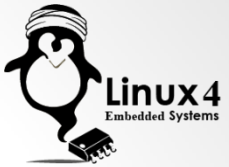
$ echo <text string to display>

$ echo $<variable Name>

```
aelarabawy@aelarabawy: ~
aelarabawy@aelarabawy:~$ echo "Good Morning"
Good Morning
aelarabawy@aelarabawy:~$ echo Good Morning
Good Morning
aelarabawy@aelarabawy:~$ MY_VAR=5
aelarabawy@aelarabawy:~$ echo $MY_VAR
5
aelarabawy@aelarabawy:~$
```

```
aelarabawy@aelarabawy-VirtualBox: ~
aelarabawy@aelarabawy-VirtualBox:~$ MY_NAME="Ahmed ElArabawy"
aelarabawy@aelarabawy-VirtualBox:~$ echo "My Name is $MY_NAME"
My Name is Ahmed ElArabawy
aelarabawy@aelarabawy-VirtualBox:~$ echo My Name is $MY_NAME
My Name is Ahmed ElArabawy
aelarabawy@aelarabawy-VirtualBox:~$
```

Display a Line of Text (echo Command)

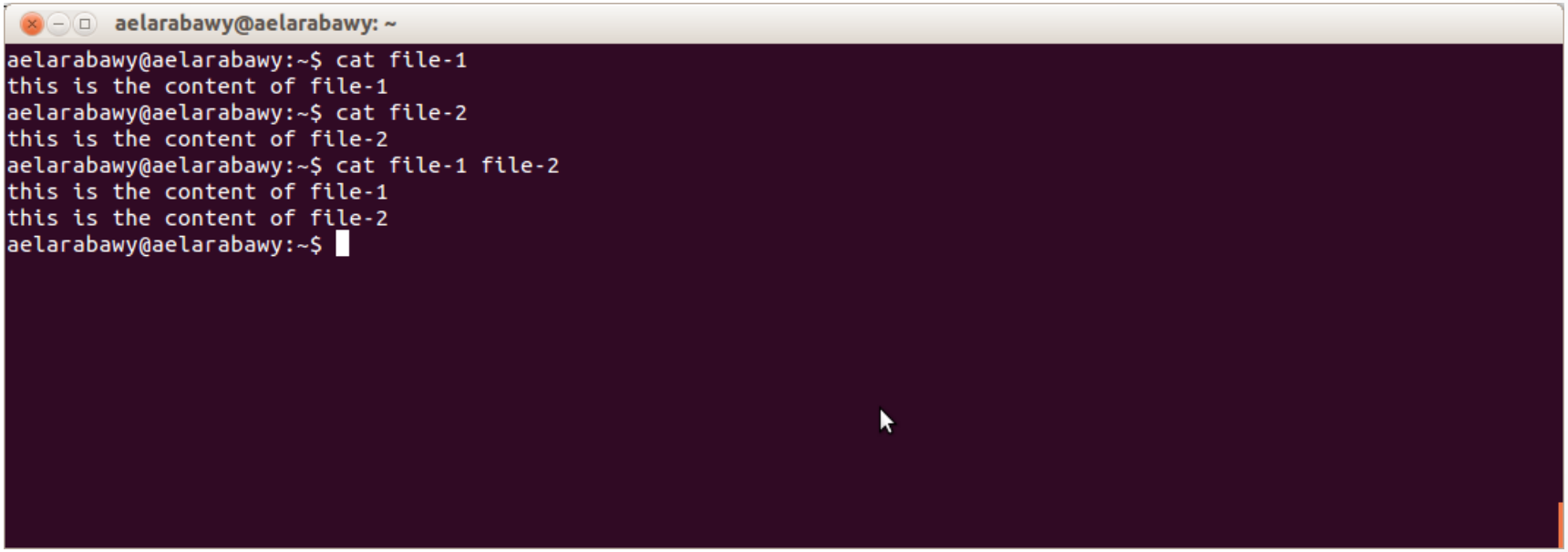


$ man echo

```
ECHO(1)                                  User Commands                                  ECHO(1)

NAME
       echo - display a line of text

SYNOPSIS
       echo [SHORT-OPTION]... [STRING]...
       echo LONG-OPTION

DESCRIPTION
       Echo the STRING(s) to standard output.

       -n     do not output the trailing newline

       -e     enable interpretation of backslash escapes

       -E     disable interpretation of backslash escapes (default)

       --help display this help and exit

       --version
              output version information and exit

       If -e is in effect, the following sequences are recognized:

       \\     backslash

       \a     alert (BEL)

       \b     backspace

       \c     produce no further output

       \e     escape

       \f     form feed

       \n     new line

       \r     carriage return

       \t     horizontal tab

       \v     vertical tab

       \0NNN  byte with octal value NNN (1 to 3 digits)

       \xHH   byte with hexadecimal value HH (1 to 2 digits)

       NOTE: your shell may have its own version of echo, which usually supersedes the version described here.  Please refer to your shell's documentation for details about the options it supports.

AUTHOR
       Written by Brian Fox and Chet Ramey.

REPORTING BUGS
       Report echo bugs to bug-coreutils@gnu.org
       GNU coreutils home page: <http://www.gnu.org/software/coreutils/>
 Manual page echo(1) line 1 (press h for help or q to quit)
```

Display Text File (cat Command)

$cat <file or files to display>

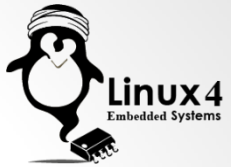


Showing the Date and Time (date Command)

$ date (Show current date and time)

- This command is very useful when we want to put time-stamps or create directories or files with the time-stamp in the name

Showing the Date and Time (date Command)



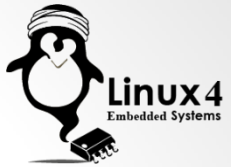
$ man date

aelarabawy@aelarabawy-demo-backup64: /bin

aelarabawy@aelarabawy-demo-backup64: /bin

```
DATE(1)                                  User Commands                                  DATE(1)

NAME
       date - print or set the system date and time

SYNOPSIS
       date [OPTION]... [+FORMAT]
       date [-u|--utc|--universal] [MMDDhhmm[[CC]YY][.ss]]

DESCRIPTION
       Display the current time in the given FORMAT, or set the system date.

       -d, --date=STRING
              display time described by STRING, not `now'

       -f, --file=DATEFILE
              like --date once for each line of DATEFILE

       -r, --reference=FILE
              display the last modification time of FILE

       -R, --rfc-2822
              output date and time in RFC 2822 format.  Example: Mon, 07 Aug 2006 12:34:56 -0600

       --rfc-3339=TIMESPEC
              output  date  and  time in RFC 3339 format.  TIMESPEC=`date', `seconds', or `ns' for date and time to the indicated precision.  Date and time components are separated by a single space:
              2006-08-07 12:34:56-06:00

       -s, --set=STRING
              set time described by STRING

       -u, --utc, --universal
              print or set Coordinated Universal Time

       --help display this help and exit

       --version
              output version information and exit

       FORMAT controls the output.  Interpreted sequences are:

       %%     a literal %

       %a     locale's abbreviated weekday name (e.g., Sun)

       %A     locale's full weekday name (e.g., Sunday)

       %b     locale's abbreviated month name (e.g., Jan)

       %B     locale's full month name (e.g., January)

       %c     locale's date and time (e.g., Thu Mar  3 23:05:25 2005)

       %C     century; like %Y, except omit last two digits (e.g., 20)
Manual page date(1) line 1 (press h for help or q to quit)
```

Showing the Date and Time (date Command)



- You can adjust your date format

  $ date +%D

  04/30/14

  $ date +%F

  2014-04-30

  $ date +%j

  120 (day of the year 001..366)

  $ date +%Y

  2014

  $ date +%m/%d/%Y

  04/30/2014

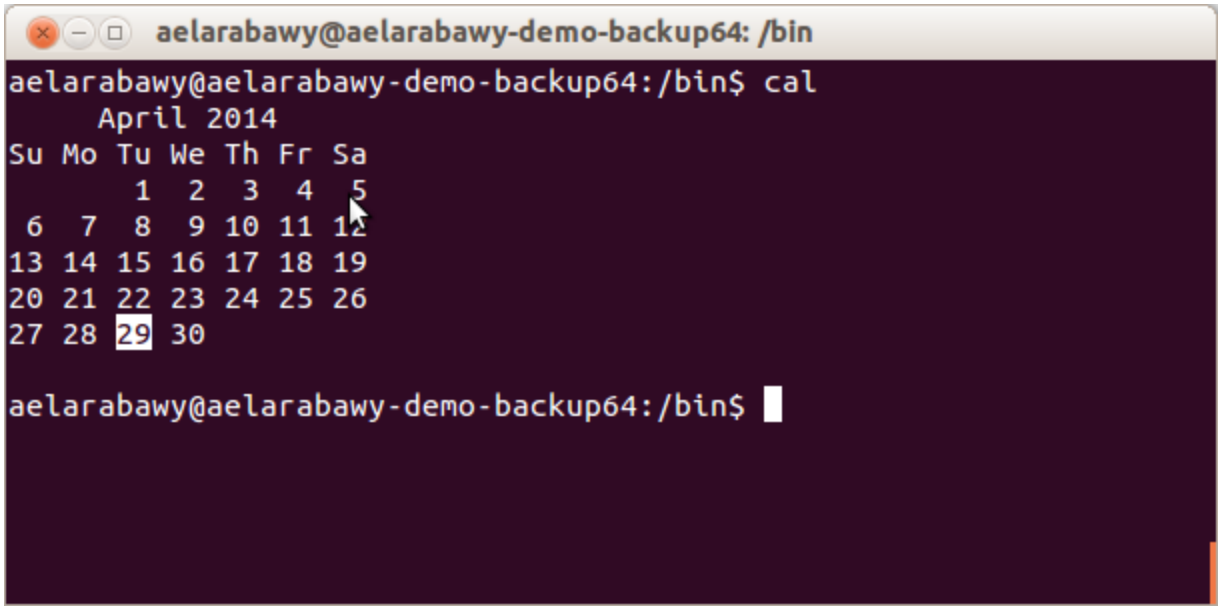
  $ date +%m-%d-%Y

  04-30-2014

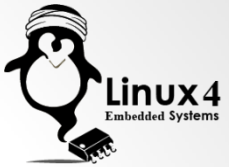
And a lot of other formats ….

Showing the Calender (cal Command)

$ cal (Show the Calendar for the current month)



Showing the Calender (ncal Command)



$ ncal

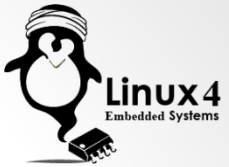
```
aelarabawy@aelarabawy-demo-backup64: ~
aelarabawy@aelarabawy-demo-backup64:~$ ncal
    April 2014
Su     6 13 20 27
Mo     7 14 21 28
Tu  1  8 15 22 29
We  2  9 16 23 30
Th  3 10 17 24
Fr  4 11 18 25
Sa  5 12 19 26
aelarabawy@aelarabawy-demo-backup64:~$
```

Showing the Calendar (cal Command)

$ cal 2011 **(shows the calendar for the year 2011)**

```
vishnu@bios-11:~$ cal 2011
                                2011

      January               February                March
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                   1            1  2  3  4  5         1  2  3  4  5
 2  3  4  5  6  7  8   6  7  8  9 10 11 12   6  7  8  9 10 11 12
 9 10 11 12 13 14 15  13 14 15 16 17 18 19  13 14 15 16 17 18 19
16 17 18 19 20 21 22  20 21 22 23 24 25 26  20 21 22 23 24 25 26
23 24 25 26 27 28 29  27 28                 27 28 29 30 31
30 31

       April                 May                   June
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                1  2   1  2  3  4  5  6  7            1  2  3  4
 3  4  5  6  7  8  9   8  9 10 11 12 13 14   5  6  7  8  9 10 11
10 11 12 13 14 15 16  15 16 17 18 19 20 21  12 13 14 15 16 17 18
17 18 19 20 21 22 23  22 23 24 25 26 27 28  19 20 21 22 23 24 25
24 25 26 27 28 29 30  29 30 31              26 27 28 29 30
                                                    Article

        July                 August              September
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                1  2      1  2  3  4  5  6               1  2  3
 3  4  5  6  7  8  9   7  8  9 10 11 12 13   4  5  6  7  8  9 10
10 11 12 13 14 15 16  14 15 16 17 18 19 20  11 12 13 14 15 16 17
17 18 19 20 21 22 23  21 22 23 24 25 26 27  18 19 20 21 22 23 24
24 25 26 27 28 29 30  28 29 30 31           25 26 27 28 29 30
31

      October               November              December
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
                   1            1  2  3  4  5               1  2  3
 2  3  4  5  6  7  8   6  7  8  9 10 11 12   4  5  6  7  8  9 10
 9 10 11 12 13 14 15  13 14 15 16 17 18 19  11 12 13 14 15 16 17
16 17 18 19 20 21 22  20 21 22 23 24 25 26  18 19 20 21 22 23 24
23 24 25 26 27 28 29  27 28 29 30           25 26 27 28 29 30 31
30 31
```

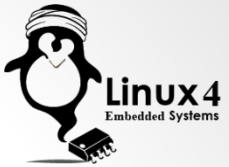
Showing the Calendar (cal Command)



$ man cal

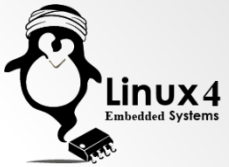
```
CAL(1)                                BSD General Commands Manual                                CAL(1)

NAME
     cal, ncal — displays a calendar and the date of Easter

SYNOPSIS
     cal [-3hjy] [-A number] [-B number] [[month] year]
     cal [-3hj] [-A number] [-B number] -m month [year]
     ncal [-3bhjJpwySM] [-A number] [-B number] [-s country_code] [[month] year]
     ncal [-3bhJeoSM] [-A number] [-B number] [year]
     ncal [-CN] [-H yyyy-mm-dd] [-d yyyy-mm]

DESCRIPTION
     The cal utility displays a simple calendar in traditional format and ncal offers an alternative layout, more options and the date of Easter.  The new format is a little cramped but it makes a
     year fit on a 25x80 terminal.  If arguments are not specified, the current month is displayed.

     The options are as follows:

     -h      Turns off highlighting of today.

     -J      Display Julian Calendar, if combined with the -e option, display date of Easter according to the Julian Calendar.

     -e      Display date of Easter (for western churches).

     -j      Display Julian days (days one-based, numbered from January 1).

     -m month
             Display the specified month.  If month is specified as a decimal number, it may be followed by the letter 'f' or 'p' to indicate the following or preceding month of that number, respec-
             tively.

     -o      Display date of Orthodox Easter (Greek and Russian Orthodox Churches).

     -p      Print the country codes and switching days from Julian to Gregorian Calendar as they are assumed by ncal.  The country code as determined from the local environment is marked with an
             asterisk.

     -s country_code
             Assume the switch from Julian to Gregorian Calendar at the date associated with the country_code.  If not specified, ncal tries to guess the switch date from the local environment or
             falls back to September 2, 1752.  This was when Great Britain and her colonies switched to the Gregorian Calendar.

     -w      Print the number of the week below each week column.

     -y      Display a calendar for the specified year.

     -3      Display the previous, current and next month surrounding today.

     -A number
             Display the number of months after the current month.

     -B number
             Display the number of months before the current month.

     -C      Switch to cal mode.

     -N      Switch to ncal mode.

     -d yyyy-mm
             Use yyyy-mm as the current date (for debugging of date selection).
Manual page cal(1) line 1 (press h for help or q to quit)
```

Question



- ***Get the Calendar for the year 1752, and tell me …. Do you find anything special ??***

Basic Calculator (bc Command)

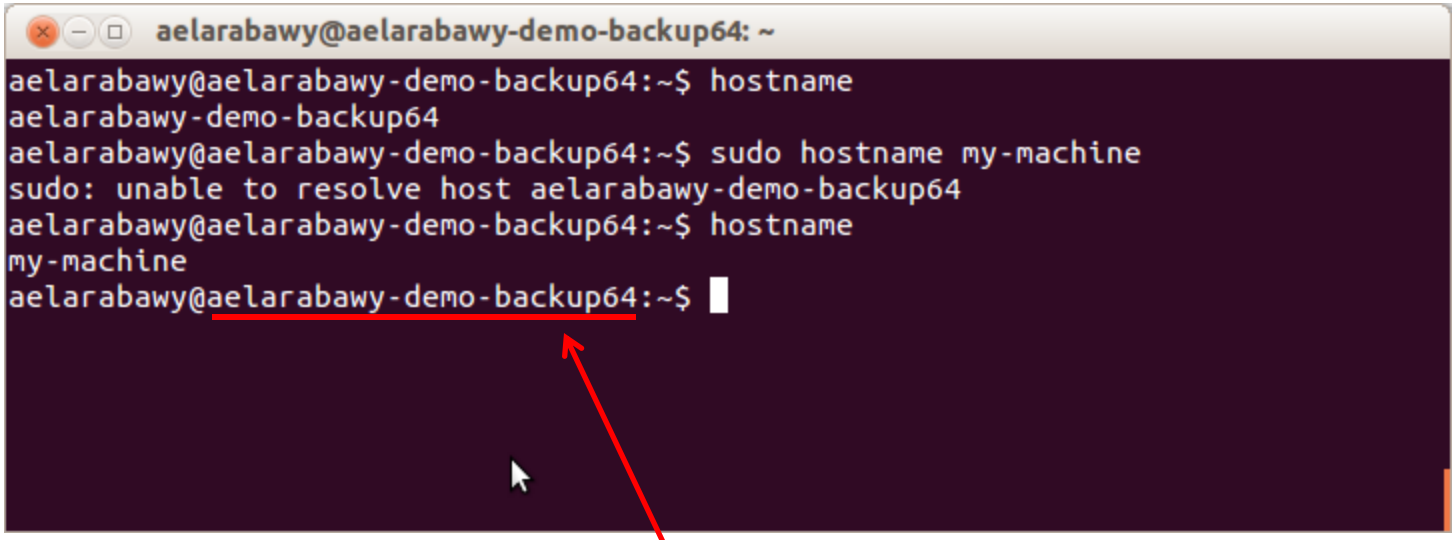


- The ***bc*** tool provides a basic math calculator
- It has capabilities from basic math, to assigning variables, to dealing with arrays
- This tool can be very useful to run mathematical formulas on the command line
- Will be even more useful in the future as we build bash scripts

Finding/Setting the Hostname (hostname Command)

$ hostname

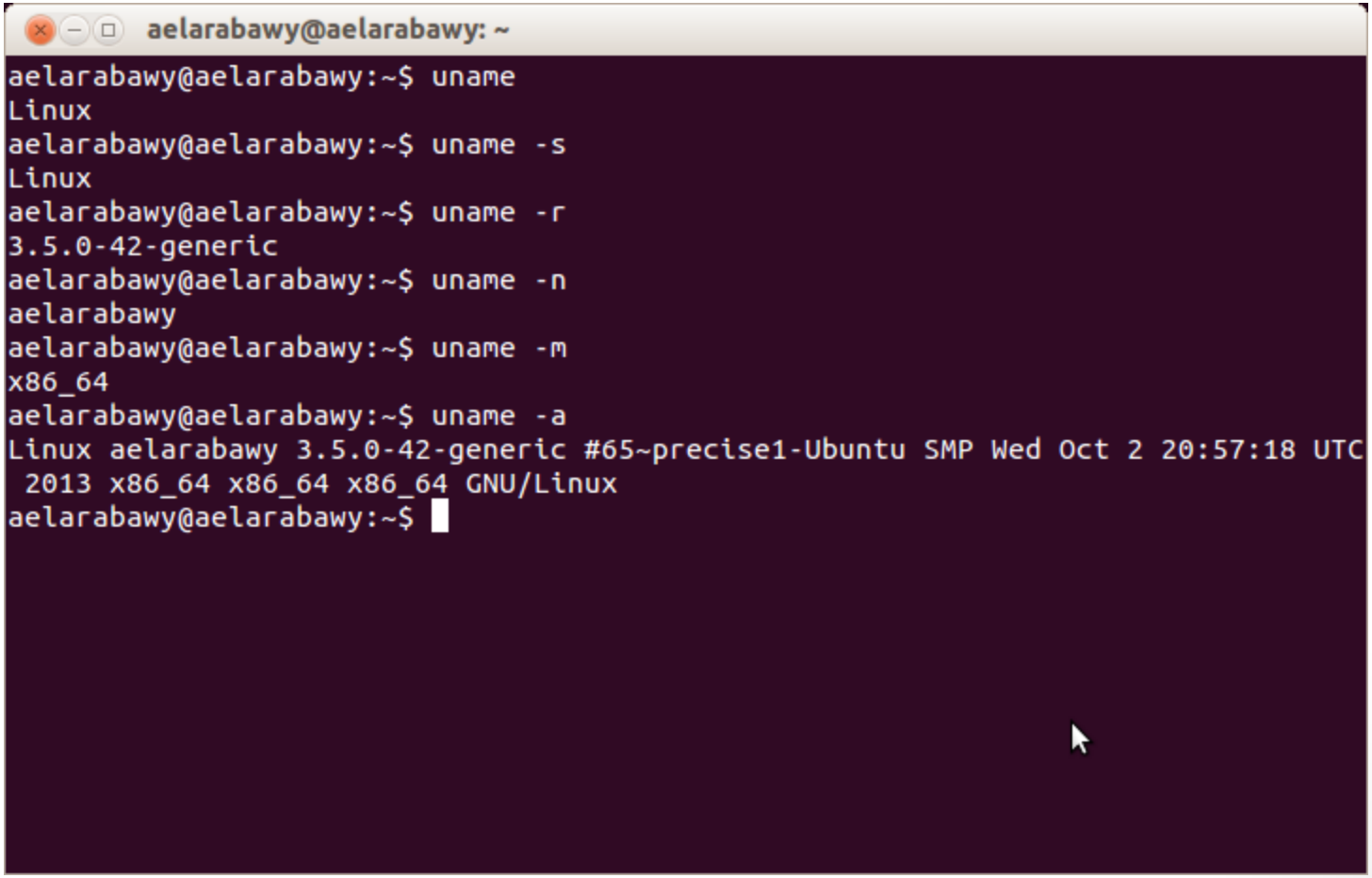
$ sudo hostname <new hostname>



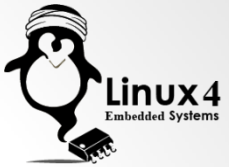
Question: Why did not the prompt change ???

Printing System Information (uname Command)

$ uname (Print multiple types of information about the system)



Printing System Information (uname Command)

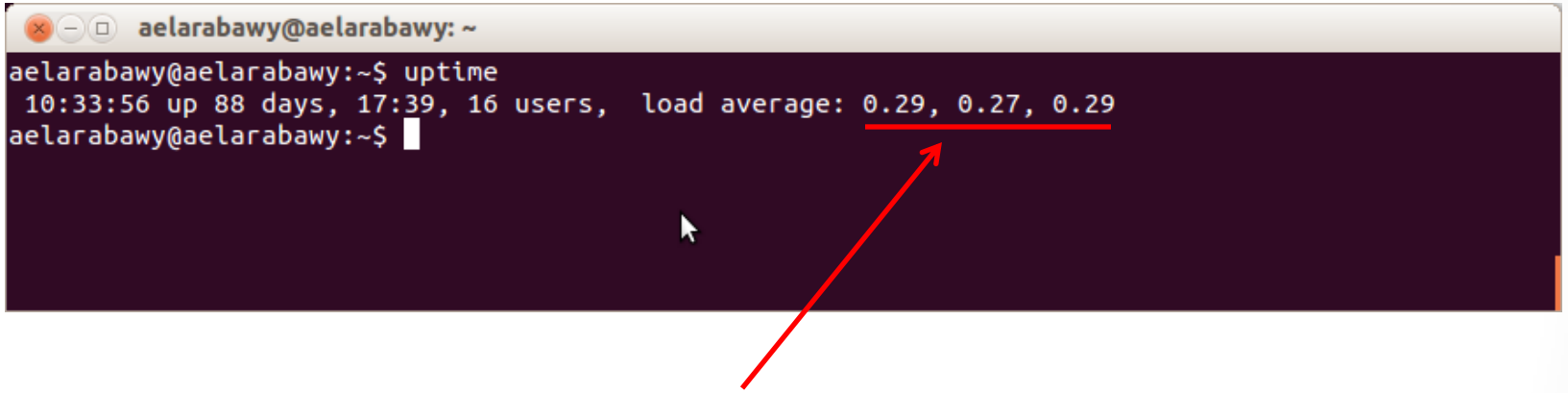


$ man uname

```
UNAME(1)                                  User Commands                                  UNAME(1)

NAME
       uname - print system information

SYNOPSIS
       uname [OPTION]...

DESCRIPTION
       Print certain system information.  With no OPTION, same as -s.

       -a, --all
              print all information, in the following order, except omit -p and -i if unknown:

       -s, --kernel-name
              print the kernel name

       -n, --nodename
              print the network node hostname

       -r, --kernel-release
              print the kernel release

       -v, --kernel-version
              print the kernel version

       -m, --machine
              print the machine hardware name

       -p, --processor
              print the processor type or "unknown"

       -i, --hardware-platform
              print the hardware platform or "unknown"

       -o, --operating-system
              print the operating system

       --help display this help and exit

       --version
              output version information and exit

AUTHOR
       Written by David MacKenzie.

REPORTING BUGS
       Report uname bugs to bug-coreutils@gnu.org
       GNU coreutils home page: <http://www.gnu.org/software/coreutils/>
       General help using GNU software: <http://www.gnu.org/gethelp/>
       Report uname translation bugs to <http://translationproject.org/team/>

COPYRIGHT
       Copyright © 2011 Free Software Foundation, Inc.  License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>.
       This is free software: you are free to change and redistribute it.  There is NO WARRANTY, to the extent permitted by law.

SEE ALSO
 Manual page uname(1) line 1 (press h for help or q to quit)
```

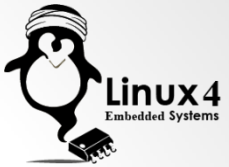
Print the System Uptime/Load (uptime Command)

$ uptime (print the system uptime and load)



System Load Average over the last 1, 5 and 15 minutes

Reboot the System (reboot Command)



$ reboot (Reboot the system)

- This command allows the user (must be root) to reboot the system

Linux 4 Embedded Systems

http://Linux4EmbeddedSystems.com