

Lab 1

Hands-on Project 1.

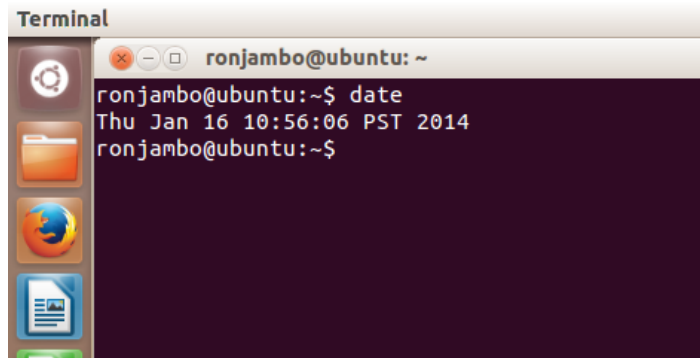
To display your system date:

1. Type **date** in the command line, and press **Enter**.

A date similar to the following appears:

```
Sat Nov 21 21:30:09 EST 2009
```

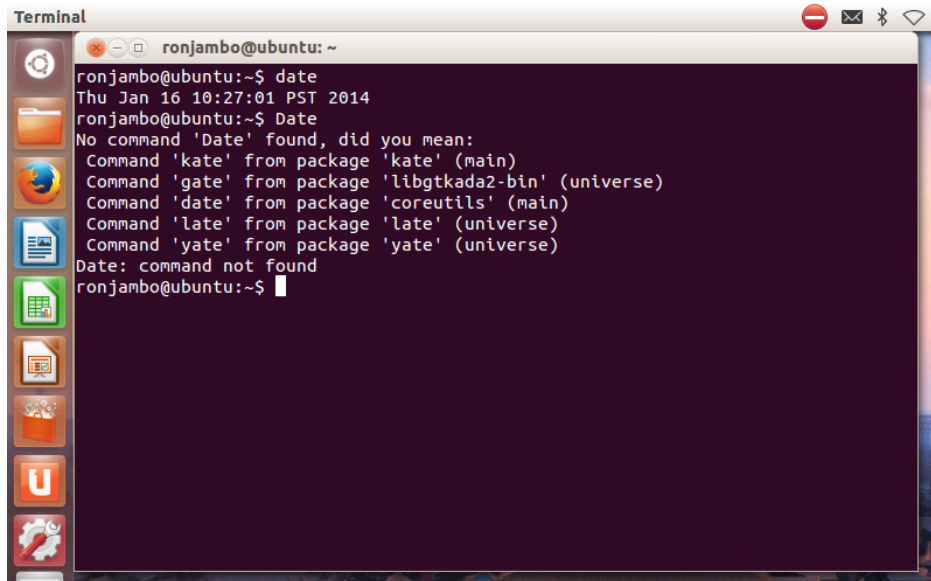
You might see the abbreviation EDT (Eastern Daylight Time) instead of EST (Eastern Standard Time), or another time zone abbreviation, such as PDT (Pacific Daylight Time) or CST (Central Standard Time). Notice also that UNIX/Linux use a 24-hour clock.



2. Type **Date** in the command line, and press **Enter**. You see the following system error message:

```
bash: Date: command not found
```

The system error message appears because you must enter the date command, like most UNIX/Linux commands, in lowercase letters.

A terminal window titled 'Terminal' with a dark purple background. The prompt is 'ronjambo@ubuntu: ~'. The user enters 'date', and the output is 'Thu Jan 16 10:27:01 PST 2014'. The user then enters 'Date', and the terminal shows a list of suggestions: 'No command 'Date' found, did you mean:', 'Command 'kate' from package 'kate' (main)', 'Command 'gate' from package 'libgtkada2-bin' (universe)', 'Command 'date' from package 'coreutils' (main)', 'Command 'late' from package 'late' (universe)', and 'Command 'yate' from package 'yate' (universe)'. Finally, the user enters 'Date:', and the terminal shows 'Date: command not found'.

```
ronjambo@ubuntu:~$ date
Thu Jan 16 10:27:01 PST 2014
ronjambo@ubuntu:~$ Date
No command 'Date' found, did you mean:
Command 'kate' from package 'kate' (main)
Command 'gate' from package 'libgtkada2-bin' (universe)
Command 'date' from package 'coreutils' (main)
Command 'late' from package 'late' (universe)
Command 'yate' from package 'yate' (universe)
Date: command not found
ronjambo@ubuntu:~$
```

Hands-on Project 2

In this project, you use the **cal** command to display the current calendar, a Julian date calendar, and the historical calendar for July 1776.

To use the **cal** command:

1. Type **cal** in the command line, and press Enter. What calendar do you see? **The calendar for the current month and year is displayed.**
2. Type **cal -j 2009** in the command line, and press Enter. What type of calendar appears? **A calendar appears that numbers the days of the year 1 – 365 instead of separating the days by the month of the year.**
3. To determine the day of the week when the Declaration of Independence was signed, type **cal 7 1776** in the command line, and press Enter. In this case, the month and year are the command arguments. **The Declaration of Independence was signed on a Thursday.**

Hands-on Project 3

Use the **clear** command anytime you want a clean slate. This project enables you to clear the screen now.

To clear the screen:

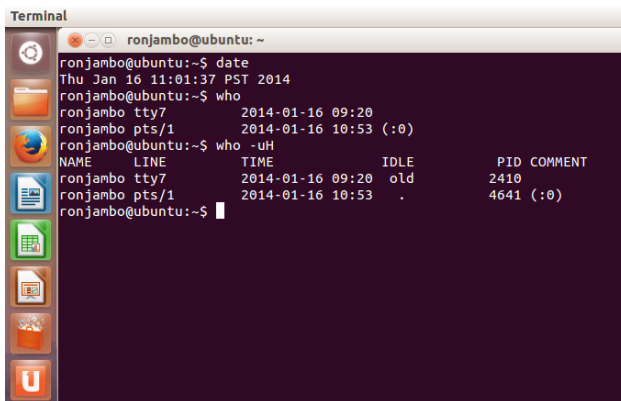
Type **clear** on the command line, and press Enter. The command prompt is now in the upper-left corner of your screen.

Hands-on Project 4

In this project, you use the command history capability of the Bash shell to recall commands you have used earlier. As you'll discover the more you use Linux, this command-line capability saves lots of time otherwise spent on repeated typing.

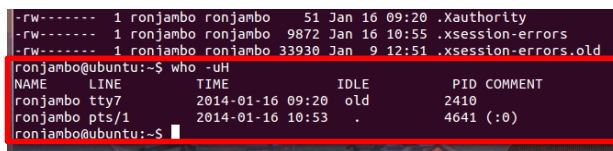
To use the command-line history:

1. Type **date** and press Enter.
2. Type **who** and press Enter.
3. Type **who -uH** and press Enter.

A terminal window titled 'Terminal' with the prompt 'ronjambo@ubuntu: ~'. The user has entered three commands: 'date', 'who', and 'who -uH'. The output of 'date' is 'Thu Jan 16 11:01:37 PST 2014'. The output of 'who' shows two users: 'ronjambo' on 'tty7' and 'pts/1'. The output of 'who -uH' shows the same two users with additional columns for 'LINE', 'TIME', 'IDLE', 'PID', and 'COMMENT'.

```
ronjambo@ubuntu:~$ date
Thu Jan 16 11:01:37 PST 2014
ronjambo@ubuntu:~$ who
ronjambo tty7      2014-01-16 09:20
ronjambo pts/1    2014-01-16 10:53 (:0)
ronjambo@ubuntu:~$ who -uH
NAME LINE      TIME      IDLE      PID COMMENT
ronjambo tty7      2014-01-16 09:20 old        2410
ronjambo pts/1    2014-01-16 10:53 .          4641 (:0)
ronjambo@ubuntu:~$
```

4. Type **clear** and press Enter.
5. Press the **up arrow** key four times. The **date** command is recalled to the command line. Do not press Enter.
6. Press the **down arrow** key twice. What command do you see? Press Enter to execute the command. **I see the 'who -uH' command.**

A terminal window showing the command history. The user has pressed the up arrow key four times, and the 'date' command is now at the prompt. Then, the user has pressed the down arrow key twice, and the 'who -uH' command is now at the prompt. The output of 'who -uH' is also visible.

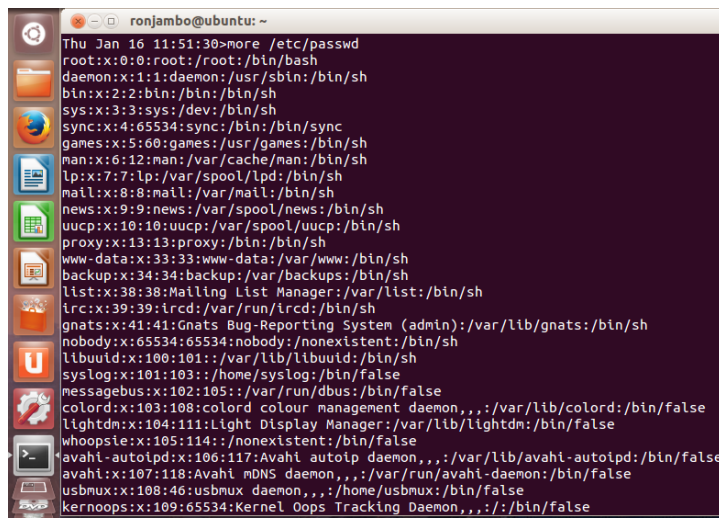
```
-rw-r--r-- 1 ronjambo ronjambo 51 Jan 16 09:20 .Xauthority
-rw-r--r-- 1 ronjambo ronjambo 9872 Jan 16 10:55 .xsession-errors
-rw-r--r-- 1 ronjambo ronjambo 33930 Jan 9 12:51 .xsession-errors.old
ronjambo@ubuntu:~$ date
Thu Jan 16 11:01:37 PST 2014
ronjambo@ubuntu:~$ who
ronjambo tty7      2014-01-16 09:20
ronjambo pts/1    2014-01-16 10:53 (:0)
ronjambo@ubuntu:~$ who -uH
NAME LINE      TIME      IDLE      PID COMMENT
ronjambo tty7      2014-01-16 09:20 old        2410
ronjambo pts/1    2014-01-16 10:53 .          4641 (:0)
ronjambo@ubuntu:~$
```

Hands-on Project 5

You can use the **more** and **less** commands to read a large file, screen by screen.

To view the contents of large files on the screen with the **more** command:

1. Type **more /etc/passwd** after the command prompt, and press Enter
2. Press **Spacebar** to scroll to the next screen.

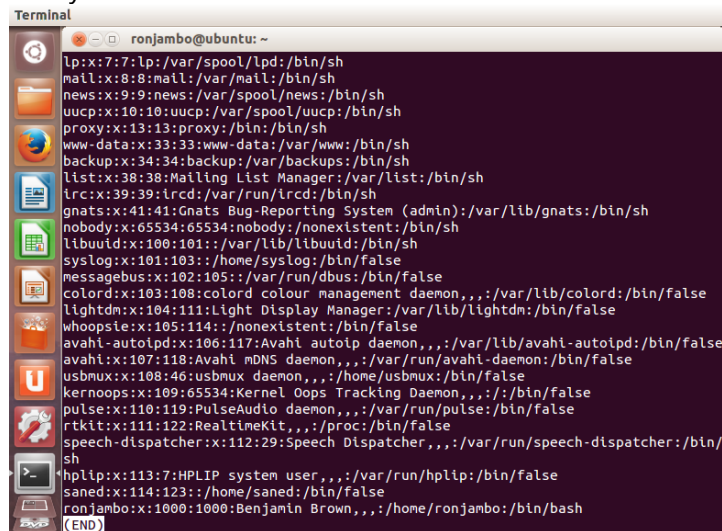
A terminal window titled 'ronjambo@ubuntu: ~' showing the output of the command 'cat /etc/passwd'. The output lists system users and regular users with their IDs, home directories, and shell types. The window has a sidebar with application icons on the left.

```
Thu Jan 16 11:51:30 more /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/bin/sh
man:x:6:12:man:/var/cache/man:/bin/sh
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
news:x:9:9:news:/var/spool/news:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
proxy:x:13:13:proxy:/bin:/bin/sh
www-data:x:33:33:www-data:/var/www:/bin/sh
backup:x:34:34:backup:/var/backups:/bin/sh
list:x:38:38:Mail List Manager:/var/list:/bin/sh
irc:x:39:39:ircd:/var/run/ircd:/bin/sh
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
libuuid:x:100:101::/var/lib/libuuid:/bin/sh
syslog:x:101:103::/home/syslog:/bin/false
messagebus:x:102:105::/var/run/dbus:/bin/false
colord:x:103:108:colord colour management daemon,,,:/var/lib/colord:/bin/false
lightdm:x:104:111:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:105:114::/nonexistent:/bin/false
avahi-autoipd:x:106:117:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/bin/false
avahi:x:107:118:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/bin/false
usbmux:x:108:46:usbmux daemon,,,:/home/usbmux:/bin/false
kernoops:x:109:65534:Kernel Oops Tracking Daemon,,,:/bin/false
```

3. Terminate the display by typing **q** (for quit).

To view the contents of large files on the screen with the **less** command:

1. Type **less /etc/passwd** after the command prompt, and press Enter. You see a long file of text on your screen.

A terminal window titled 'Terminal' showing the output of the command 'less /etc/passwd'. The output is displayed in a scrollable format, showing the same list of users as the previous image. The window has a sidebar with application icons on the left.

```
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
news:x:9:9:news:/var/spool/news:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
proxy:x:13:13:proxy:/bin:/bin/sh
www-data:x:33:33:www-data:/var/www:/bin/sh
backup:x:34:34:backup:/var/backups:/bin/sh
list:x:38:38:Mail List Manager:/var/list:/bin/sh
irc:x:39:39:ircd:/var/run/ircd:/bin/sh
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
libuuid:x:100:101::/var/lib/libuuid:/bin/sh
syslog:x:101:103::/home/syslog:/bin/false
messagebus:x:102:105::/var/run/dbus:/bin/false
colord:x:103:108:colord colour management daemon,,,:/var/lib/colord:/bin/false
lightdm:x:104:111:Light Display Manager:/var/lib/lightdm:/bin/false
whoopsie:x:105:114::/nonexistent:/bin/false
avahi-autoipd:x:106:117:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/bin/false
avahi:x:107:118:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/bin/false
usbmux:x:108:46:usbmux daemon,,,:/home/usbmux:/bin/false
kernoops:x:109:65534:Kernel Oops Tracking Daemon,,,:/bin/false
pulse:x:110:119:PulseAudio daemon,,,:/var/run/pulse:/bin/false
rtkit:x:111:122:RealtimeKit,,,:/proc:/bin/false
speech-dispatcher:x:112:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/sh
hplip:x:113:7:HPLIP system user,,,:/var/run/hplip:/bin/false
saned:x:114:123::/home/saned:/bin/false
ronjambo:x:1000:1000:Benjamin Brown,,,:/home/ronjambo:/bin/bash
(END)
```

2. Press the **down arrow** key several times to scroll forward in the file one line at a time.
3. Press the **up arrow** key several times to scroll backward in the file one line at a time.
4. Press **Pg Dn** (or **Page Down**), **Spacebar**, **z**, or **f** to scroll forward one screen.
5. Press **Pg Up** (or **Page Up**) or **b** to return to a previous screen.
6. Terminate the display by typing **q** (for quit).

Hands-on Project 6

In this project, you will use the **pwd** command to view your working directory.

To display your current path:

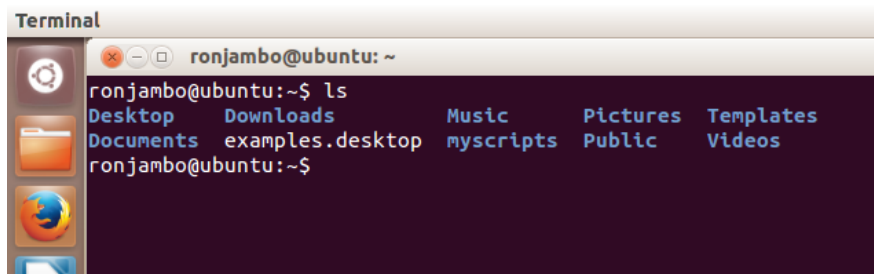
1. Type **pwd** and press Enter.
2. What is your current directory path? **/home/ronjambo**

Hands-on Project 7

The **ls** command is one of the most useful commands. In this project, you will start by using **ls** to view your working directory. Next, you use **ls** with an argument to view a file and then a directory. For a more complete listing of information about the contents of a directory, you use the **-l** option, and finally you use the **-a** option to include hidden files in a directory listing.

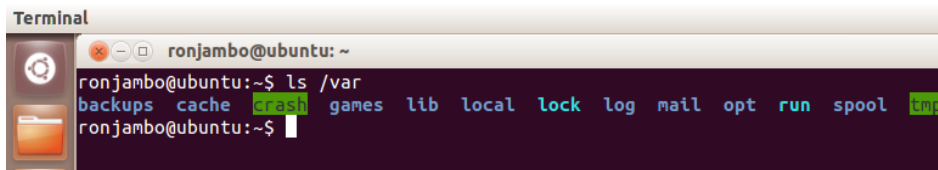
To see a list of files and directories in your current working directory:

Type **ls** and press Enter. You see a list of file and directory names.



```
Terminal
ronjambo@ubuntu: ~
ronjambo@ubuntu:~$ ls
Desktop  Downloads  Music      Pictures  Templates
Documents examples.desktop  myscripts  Public    Videos
ronjambo@ubuntu:~$
```

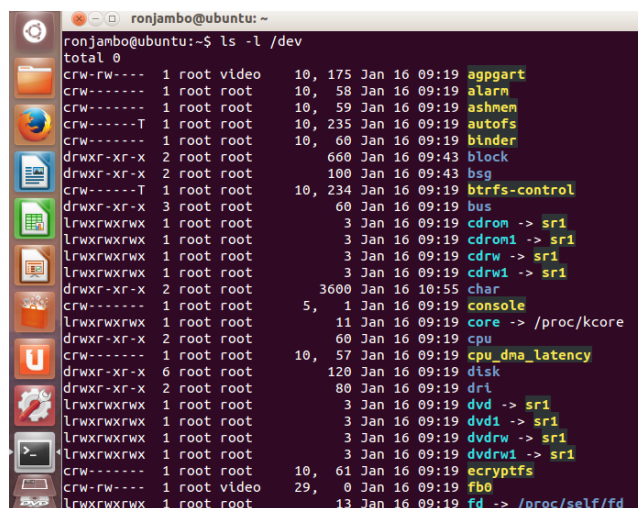
To see the contents of a directory other than your current working directory, give the directory name as an option to the **ls** command. For example, to see the contents of the **/var** directory, type **ls /var** and press Enter.



```
Terminal
ronjambo@ubuntu: ~
ronjambo@ubuntu:~$ ls /var
backups cache crash games lib local lock log mail opt run spool tmp
ronjambo@ubuntu:~$
```

To use the **ls command with the **-l** option:**

1. Type **ls -l /dev** and press Enter. This shows a listing of block special and character special files in the **/dev** directory.



```
ronjambo@ubuntu: ~
ronjambo@ubuntu:~$ ls -l /dev
total 0
crw-rw---- 1 root video 10, 175 Jan 16 09:19 agpgart
crw----- 1 root root 10, 58 Jan 16 09:19 alarm
crw----- 1 root root 10, 59 Jan 16 09:19 ashmem
crw-----T 1 root root 10, 235 Jan 16 09:19 autofs
crw----- 1 root root 10, 60 Jan 16 09:19 binder
drwxr-xr-x 2 root root 660 Jan 16 09:43 block
drwxr-xr-x 2 root root 100 Jan 16 09:43 bsg
crw-----T 1 root root 10, 234 Jan 16 09:19 btrfs-control
drwxr-xr-x 3 root root 60 Jan 16 09:19 bus
lrwxrwxrwx 1 root root 3 Jan 16 09:19 cdrom -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 cdrom1 -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 cdrw -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 cdrwl -> sr1
drwxr-xr-x 2 root root 3680 Jan 16 10:55 char
crw----- 1 root root 5, 1 Jan 16 09:19 console
lrwxrwxrwx 1 root root 11 Jan 16 09:19 core -> /proc/kcore
drwxr-xr-x 2 root root 60 Jan 16 09:19 cpu
crw----- 1 root root 10, 57 Jan 16 09:19 cpu_dma_latency
drwxr-xr-x 6 root root 120 Jan 16 09:19 disk
drwxr-xr-x 2 root root 80 Jan 16 09:19 dri
lrwxrwxrwx 1 root root 3 Jan 16 09:19 dvd -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 dvd1 -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 dvdwr -> sr1
lrwxrwxrwx 1 root root 3 Jan 16 09:19 dvdwr1 -> sr1
crw----- 1 root root 10, 61 Jan 16 09:19 ecryptfs
crw-rw---- 1 root video 29, 0 Jan 16 09:19 fb0
lrwxrwxrwx 1 root root 13 Jan 16 09:19 fd -> /proc/self/fd
```

2. Type
Enter
of the

```
ronjambo@ubuntu:~$ ls -l
drwxr-xr-x  2 root root 4096 Jan  7 13:25 cdrom
drwxr-xr-x 15 root root 4340 Jan 16 09:43 dev
drwxr-xr-x 128 root root 12288 Jan 16 09:43 etc
drwxr-xr-x  3 root root 4096 Jan  7 13:26 home
lrwxrwxrwx  1 root root   33 Jan  9 09:14 initrd.img -> /boot/initrd.img-3.8.0-35-generic
lrwxrwxrwx  1 root root   32 Jan  7 13:41 initrd.img.old -> boot/initrd.img-3.8.0-29-generic
drwxr-xr-x 20 root root 4096 Jan  9 09:12 lib
drwxr-xr-x  2 root root 4096 Jan  9 09:09 lib64
drwx----- 2 root root 16384 Jan  7 13:22 lost+found
drwxr-xr-x  4 root root 4096 Jan 16 09:43 media
drwxr-xr-x  3 root root 4096 Jan  7 13:45 mnt
drwxr-xr-x  2 root root 4096 Jan  7 13:45 opt
dr-xr-xr-x 196 root root   0 Jan 16 09:19 proc
drwx----- 5 root root 4096 Jan  9 12:13 root
drwxr-xr-x 21 root root  760 Jan 16 09:20 run
drwxr-xr-x  2 root root 4096 Jan  9 09:12 sbin
drwxr-xr-x  2 root root 4096 Mar  5 2012 selinux
drwxr-xr-x  2 root root 4096 Aug 20 10:56 srv
dr-xr-xr-x 13 root root   0 Jan 16 09:19 sys
drwxrwxrwt 17 root root 4096 Jan 16 11:17 tmp
drwxr-xr-x 10 root root 4096 Aug 20 10:56 usr
drwxr-xr-x 13 root root 4096 Jan  9 09:18 var
lrwxrwxrwx  1 root root   29 Jan  9 09:14 vmlinuz -> boot/vmlinuz-3.8.0-35-generic
lrwxrwxrwx  1 root root   29 Jan  7 13:41 vmlinuz.old -> boot/vmlinuz-3.8.0-29-generic
ronjambo@ubuntu:~$
```

ls -l / and press
to view the contents
root file system
directory.

To list hidden files in your home directory:

1. Type **clear** and press Enter to clear the screen.
2. Type **ls -a** after the command prompt and press Enter.

```
ronjambo@ubuntu:~$ ls -a
.          .dmrc          .gvfs          .pulse
..         Documents  .ICEauthority  .pulse-cookie
.bash_history Downloads      .local         Templates
.bash_logout examples.desktop .mission-control .thumbnails
.bashrc    .fontconfig   .mozilla       Videos
.cache     .gconf        Music          .Xauthority
.compiz-1  .gksu.lock    msyscripts     .xsession-errors
.config    .gnome2       Pictures       .xsession-errors.old
.dbus     .gstalker-0.10 .profile
Desktop   .gtk-bookmarks Public

ronjambo@ubuntu:~$
```

Hands-on Project 8 (Optional. This is outside the scope of this class, but do it for fun anyways!!!)

Now onto something fun! Changing the prompt!

The **PS1** variable contains the configuration parameters for how your command-prompt line appears. In this project, you will view the contents of the **PS1** variable and then you configure the **PS1** variable. You should be using the default Bash shell and be logged in using your own account and home directory.

To view the **PS1 variable's contents and then to configure the variable:**

1. Type `echo $PS1` and press Enter.
2. You see the contents of the `PS1` variable appear as:
`[\u@\h \w] \ $`
3. To change your prompt to display the date and time, type `PS1='\d \t>'` and press Enter. Type the command with no spaces between the characters, other than one space between `\d` and `\t`. Your prompt now looks similar to:

Tue Jul 5 09:18:33>

4. To change your prompt to display the current working directory, type `PS1='\w>'` and press Enter. Your prompt now looks similar to:

~>

The `\w` formatting character displays the `~` to represent the user's home directory.

5. To change your prompt to display the full path of the current working directory, you must use another environment variable, `PWD`. The `PWD` variable contains the full pathname of the current working directory. To display the `PWD` variable in the prompt, type `PS1='$PWD>'` and press Enter. (Notice that you must place the `$` in front of the environment variable name to extract its contents.) Your prompt now looks similar to:

/home/jean>

6. If you are using a terminal window, close and open a new terminal window session, or log out and log back in and then access the command line. How does your prompt change from what you saw in Step 5? **The prompt changes to appear more like an e-mail address showing the current user's name and the Linux distro being used.**