Root Privileges

• Most Linux systems include an account for a user named root (Superuser) who has special privileges.
• Root account is normally locked
• Two main ways to gain root privileges:
  o When you start a program that requires root privileges
    - Enter root password to perform administrative tasks
  o Using sudo utility (textual applications) / gksudo utility (graphical applications)
• You cease working with root privileges when your command finishes or when you exit the program you started with root

• **Caution:** Do not experiment while working with root privileges
A Tour of the Ubuntu Desktop

- **GNOME**: the user-friendly default desktop manager under Ubuntu Linux

- **KDE (K Desktop Environment)**: a powerful desktop manager and a complete set of tools you can use in place of GNOME

- The version of Ubuntu that runs KDE is named **Kubuntu**
Logging in on the System

Language
Session (Desktop manager)
Log in remotely
Restart
Shutdown

Options
The GNOME Desktop manager

- Create a normal user to experiment with your desktop and play around with the tools and applications that come in with your desktop manager.

- GNOME displays a workspace that includes top and bottom panels (bars) that makes your work easier by having shortcuts for quick access. It can be configured easily.
• Ubuntu configures GNOME with two workspaces. A workspace is what you see displayed on the screen.

• The desktop which is not displayed all at once, is the collection of workspaces.
Launching Programs

1- The effect of clicking an object on the desktop depends on what the object is designed to do:
   - Start a program
   - Display a menu or folder
   - Open a file or menu
   - Open a dialog box

2- You can start the program by selecting it from the menu

Starting a program from the menu. Notice that the right arrow means that there is a sub menu that can be displayed
3- Pressing Alt+F2 where you will see the run application window, through which you can type the name of the application that will be recognized as you type.
Try it yourself!

• Use the run window to run command-line utilities (textual). Do not forget to place a tick in the check box labeled “Run in terminal”. It will run the command in a terminal window and closes when it is done automatically!

• Ex: type `vim` (text-based editor), put a tick in the box, then RETURN
  To exit the terminal, press `ESCAPE:q`!
• The command-line utility displays the output then terminates. You can keep the terminal window open, temporarily or until you close it after running the command:

Ex: Type `bash “df -h ; read”`

Which executes the bash shell and executes the two commands separated with a semicolon. You can replace the “read” with `Sleep 10` to keep the window open for 10s
Setting Personal Preferences

- You can set preferences for many objects including those on the panels

- Ex: Workspace switcher - right click anywhere on the switcher and select Preferences from the menu. You can specify the # of workspaces

- **Exercise**: Experiment with the clock applet preferences to change time, city (weather info)
Mouse preferences

- Access it by Choosing: System ➔ Preferences ➔ Mouse, or give the command: `gnome-mouse-properties` from a terminal or run application window (Alt+F2)
  - Change orientation of mouse buttons
  - Double-click timeout slider ➔ double-click speed
Using Nautilus to Work Files

- **Nautilus**: The GNOME file manager. You can use it to create, open, view, and copy files and folders, as well as to execute programs and scripts.
- One of the basic functions of Nautilus is to create and manage the desktop.
- The term “Folder” = “Directory”. The first is usually used in graphical contexts, and the second is used in textual (command-line) contexts.
- You can open a folder in a new window by middle clicking it, or right click ➔ **open in New Window**
The Desktop Directory

• The files on the desktop are held in a directory that has a pathname `/home/username/Desktop`, where `username` is your login name

• Choose **Places** ⇒ **Desktop** so that GNOME opens a file browser window showing the files on the desktop

• Clicking the pencil and paper object marked in the previous figure causes Nautilus to display in the location text box the pathname of the directory it is displaying
• The desktop directory is like any other directory except that it is special since GNOME displays its contents on the desktop (in every workspace)
• You can work with the desktop directory because it is always displayed, whereas you need to use a utility as Nautilus to reach the other directories
• 
  **Try it yourself**: Example p95-98
• Using the **file browser menubar**: File-><Move to Trash moves the selected file to `.Trash` directory
• `.Trash` is a directory in `/home/username/`
• Since its name starts with a period, usually it is not displayed ➔ press CONTROL-H or select File browser menu: View->show hidden files to display hidden files
The Update Notifier

• System is initially set up to automatically search for a notify when software updates are available (for systems connected to the internet)

• You can open the update manager window by:
  - Clicking the Notifier object opens the update manager window.
  - Or going to System ➔ Administrator ➔ update manager, or by giving the command
  - Or giving the command update-manager from the terminal emulator or Run Application window (Alt-F2)

• Installing the updates requires the root password
Themes

• Changing the appearance of the Linux desktop is one of its most exciting features

• In a GUI, a Theme is a recurring pattern and overall look that pleases the eye and easy to interpret and use

• You can modify any theme as in WINDOWS (Background, fonts, interface)

• Customizing a theme changes the way it looks (as in changing the icons a theme uses)
The Appearance Preferences window is the key to changing the appearance of the desktop. Can be displayed by:

- **Main menu:** System ➔ Preferences ➔ Appearance
- Or by right-cli the root window (any empty space on the workspace) and selecting **Change Desktop Background**

The Interface tab enables you to modify the appearance of window menus and toolbars.

The **visual effects** enables you to select one of three levels of visual effects: None, Normal, and Extra. Normal and Extra replaces Metacity window manager with **Compiz Fusion** (Compiz-Fusion.org) which implements 3D desktop effects. Compiz is the name of the core, and Compiz Fusion are the plugins.
• Wiggly windows is one of the most famous visual effects among others
• **Caution:** Visual effects might cause problems by reducing performance in 3D applications and video playback
Session Management

• The session starts when you log in and ends when you log out
• GNOME can manage sessions so that the desktop looks the same as it did when you saved a session or logged out (The same windows will be positioned as they were on the same workspaces and programs will be the same as you left them)
• To save a session:
  o **System ➔ Preferences ➔ Sessions** which will get you the sessions window.
  o Click **Session Options** tab and click remember currently running applications
  o If you want GNOME to automatically do this, then check the box labeled **Automatically remember running applications when logging out**
Getting Help

• Click the question mark object on the top panel to display the Ubuntu help center window
Experimenting with your Desktop

- Try the different applications:
  - OpenOffice.org
  - Firefox
  - Pidgin Graphical IM that allows you to chat with other IM clients (Yahoo!, MSN, AOL)
Logging Out

• Clicking the log out button
• Or **System→logout** *username*
• Or you can choose to restart or shutdown among other options from the textual environment, press **CONTROL-D** or give the command **exit** at the shell prompt
GNOME Desktop Terminology

- **Desktop**: Comprises all of the GNOME GUI
- **Panels**: bars that appear on the desktop and hold panel objects (Initially one at the top and one at the bottom)
- **Panel Object**: Appear as words or icons on the panel. You click them to display menus, run applets, or launch programs
- **Workspace**: Divides the desktop into one or more areas, with one such area filling the screen at one time
Opening Files

• When open a file, GNOME figure out the appropriate tool to use by determining the file’s *MIME* type.

• GNOME associates each filename extension with a MIME type and each MIME type with a program
  - Ex: to open a file with extension `ps`, GNOME calls the Evince document viewer which displays the postscript file in a readable format
Panels

- Panels can be customized the same way you do it in WINDOWS using the Panel Context Menu
Panel Objects

- **Applets**: A small program that displays its user interface on or adjacent to the panel (Clock, Mixer (Volume Control), Workspace Switcher)

- **Window List Applet**

- **Launchers**: Each launcher executes a command, starts an application, Displays the content of a folder.
  - Main Menu: Applications - execute any application
  - Main Menu: Places - Open home folder, desktop, Documents, ...etc.

- **The panel Object Context Menu**: Right-clk an object to allow you to Remove, Move, Or Lock that object
The Main Menu

• **Applications**: Games, Graphics, Internet, Office

• **Places**: a variety of launchers most of which open a file browser window

• **System Menu**: Has two important sub-menus
  
  o Preferences sub-menu that establishes the characteristics of your account
  
  o Administration sub-menu controls the way the system works.
    
    - Ex1: Administration ➔ Printing sets up and configures printers.
    - Ex2: Administration ➔ Software Sources controls which repositories you can download software from and how often the system checks for updated software
Windows

- **Window Manager**: The program that controls the look and feel of the basic GUI - runs under a desktop manager (GNOME or KDE) and controls all aspects of the X Window System Environment.

- **Root Window**: Any part of the workspace that is not occupied by a window, panel, or object.

- To view it when it is obscured, click the Show Desktop button at the left end of Bottom panel to minimize the windows in the workspace.
Running Commands From a Terminal Emulator / Shell

- **Terminal Emulator**: a window that presents a command-line interface (CLI). It is displayed in a graphical environment.

- To display: Applications ➔ Accessories ➔ Terminal. Shortcut: gnome-terminal from Run window (Alt-F2).

- Try running the command `man man` to learn about manual pages.

- Several characters have special meaning to the terminal emulator window (`*`, `?`, `|`, `[`, `]`), avoid using them for now until you learn more later.
- **Shell**: Command interpreter that you communicate with once you open a terminal emulator window.
The Object Properties Window

- Displays information about a file (owner, size, MIME type (Multi-purpose Internet Mail Extension)).
- Right-click the object ➞ properties
- It has five common tabs:
  - Basic: displays basic info about the file (MIME type, choose a custom icon)
  - Emblems: Allows you to add or remove emblems associated with the file. Nautilus displays emblems in both its icon and List views
  - Permissions: You can do this in graphical format by issuing the command:
    ```
gksudo nautilus
    ```
    Which open a file browser window running the root privileges
  - Open with
Emblems

• You can use this property to keep track of files which contain important data. For example, I have a folder containing contact information of people I interact with. I have tagged this file with the icon showing 'two people' which gives me a cue as to what is in this file.

*Fig: Shows the folders and files tagged with unique icons*
Updating, Installing, and Removing Software Packages

• The Update Notifier prompts you every time updates are available for your system. We usually use:
  o Software Sources Window (easy to use)
  o Synaptic (wider selection of software)
Software Sources Window

- Repositories hold collection of software packages and related information
- To open: System ➔ Administrator ➔ Software Sources. Shortcut: gksudo software-properties-gtk
- The Ubuntu software tab controls which categories of packages APT and synaptic install and the Update Manager updates automatically
- Caution: Do not add a third-party repository unless you trust it as it might cause the system to not work properly and cause updates to fail
• You will always need to download security updates and recommended updates so make sure they are checked in the Updates tab in the Software Sources window

• The authentication tab holds keys for trusted software providers

• Statistics: Allows you to participate in a software popularity contest
Add/Remove Applications

- Applications ➔ Add/remove. Shortcut: issue the command `gnome-app-install`
  - You can enter the name of the application in the search box. Unless you want to limit selection, choose “All Available Applications”
  - To limit selections to packages supported by Ubuntu, select “Canonical Maintained”
Synaptic: Finds, Installs and Removes Software

- Go to: Administration->Synaptic Package Manager. Shortcut: gksudo synaptic

If highlighted, the upper left column shows the categories of software
Example on Using Synaptic

- Assuming you want to install Dream Chess (the DreamChess package www.dreamchess.org)
- Because this package is installed, all selection except “mark for installation” are grayed out
- Because the dreamchess package is dependent on other packages that are not installed, synaptic displays a window asking you if you want to mark additional required changes
1. To display help, click the blue object with a question mark in it on the top panel, or go to System ➔ Help and Support

2. **Man**: This textual utility displays the system manual. It is helpful when you know exactly which utility you want to use but forgot how to use it
   - The online `man` pages does not require you to install the utility to read its `man` pages
   - The `man` utility sends its output through a pager - usually `less`, which displays one screen at a time. You can go to the next screen using the **SPACE** bar.
   - Pressing **h** (help) displays a list of `less` commands
   - Pressing **q** (quit) stops less and causes the shell to display the prompt
Based on the FHS, the Linux system manual and the `man` pages are divided into ten sections.

In some cases the manual contains entries for different tools with the same name.

**Example**

```bash
$ man passwd  # (displays the man page for the passwd utility from section 1 of the system manual)
$ man 5 passwd  # (displays the man page for the passwd from section 5)
```

You can use the `-a` option to view all man pages for a given subject (press `q RETURN` to display the next man page).

**Example**

```bash
man -a passwd
```
Apropos: Searching for a Keyword

- When you do not know the name of the command you need for a certain task, use `apropos` with a keyword to search for it.
- If you use the `man` utility with the `-k` option, it becomes exactly as `apropos`.
- `Whatis` is the database that `apropos` uses, and it is not installed by default when you first install Ubuntu.
- If `apropos` does not produce any output, run the command:
  ```
  sudo mandb
  ```
  To build the database automatically so that `apropos` is active.
- The output of `apropos`, includes the name of each command, the section of the manual that contains it, and a brief description from the top of the man page.

*Example*

```
$ apropos who
```
• **Whatis** utility is similar to apropos but finds only complete word matches of the name for the utility

*Example*

```bash
$whatis who
Who (1) - show who is logged on
```
Info: Displays Information about Utilities

- **Info** displays a more complete and up-to-date information on GNU utilities than does man

  **Example**
  Info coreutils (the coreutils software package holds the Linux core utilities)

- When you see the initial **info** screen you interact by pressing:
  - `h` to go through an interactive tutorial on info
  - `?` To list info commands
  - `SPACE` to scroll
  - `m` followed by the name of the menu you want to display
  - `q` or `CONTROL-C` to quit

- The notation info uses to describe the keyboard keys may not be familiar to you:
  - `C-H = CONTROL-H`
  - `M-x = META or ALT` and press `x`
• If you want to search for the string `sleep` in the display after executing your `info` command, you need to write `/sleep`RETURN

• Press RETURN again (or /RETURN) displays the next occurrence of the string you are searching for

• The asterisk at the beginning of the line indicates that this entry is a menu item

• You can use the ARROW keys to scroll to the menu item you want that represents a link to the info page associated with that entry, and press ENTER

• Another way is that you can type the name of the menu item to view the information

The screen info coreutils displays after you type /sleepRETURN twice
• To display information on `sleep` as an example, you can type `m sleep` where `m` means menu.
• The figure shows the top node of information on sleep.
• A node groups a set of information you can scroll through with `SPACE` bar.
• To display the next node, press `n`. Press `p` to display the previous node.
• If you want to print a manual page, you can use the man utility with the -t option

*Example*

Man -t cat | lpr  (prints info about the cat utility)
• **Pinfo** utility is similar to **info** but is more intuitive if you are not familiar with the *emacs* editor. It uses color to make its interface easier to use.

• You have to use synaptic to install the **pinfo** package if you want to experiment with it.

• You can also use the **--help** option to display information about the utility.

*Example*

$ cat --help

• If the info that **--help** displays runs off the screen, send the output through the less pager using a pipe as in:

  $ ls --help | less
More about Logging in

• At the log in screen:
  o Session: Displays the session dialog box with several choices about the about to start session:
    ➢ **Last session**: Same desktop environment you used the last time you logged in (default)
    ➢ **Run Xclient script**: Brings up default desktop environment
    ➢ **GNOME** (refer to CH3)
    ➢ **KDE** (refer to CH3)
    ➢ **Failsafe GNOME**: Brings up default GNOME session without running any startup script - used to fix problems that prevent you from logging in
    ➢ **Failsafe terminal**: brings up an xterm terminal emulator window without a desktop manager and without any startup script. Type **exit** when you are done to logout and go back to the login screen
I cannot Log In!

- Username and password are case sensitive. It does not tell which is wrong to discourage unauthorized people from guessing names and passwords to gain access to the system.
- You are not logging in on the right machine.
- Username is not valid.
- A filesystem is full. If a filesystem that is critical to the login process is full, it will appear as if you are logging in successfully but after a moment the login screen appears again. *solution* is to login using one of the failsafe modes to delete some files.
Logging in Remotely

- Logging in via a dial-up line connection is straightforward. You instruct the local emulator to contact the remote Linux machine, dials the phone, and then you log in.

- When you log in via a directly connected network, use `ssh` (secure) or `telnet` (not secure) to connect to the remote system:
  - You have to type in the IP address (Host address) or its name to start the login procedure.
Logging in from a Terminal (Emulator)

- Before you log in on a terminal, terminal emulator, the system displays a message called *issue* (stored in `/etc/issue` file) that identifies the version of the Ubuntu Linux running on your system.
- This message is followed by a prompt to log in.
- If login does not appear press `CONTROL-Q`.
- Next the shell prompt appears indicating that you have successfully logged in which may be preceded by a short message called “message of the day” or `motd`.
- The prompt looks like `[user@host:directory]$`:
  - User is your username.
  - Host is the name of the local system.
  - Directory is the name of the directory you are working in.
  - The tilde (`~`) represents the home directory.
- **Security**: As you log in to textual environment, Ubuntu displays information about your last login, showing when it took place and where it was originated - use it to verify access to your account!
Changing your password

• **System ➔ preferences ➔ About Me** and then change password. Shortcut: Passwd

• Your password must be at least four characters long!

• **Pwgen** utility generates a list of almost random passwords that help pick one you can easily remember
Virtual Consoles

• Using the physical console, you can access as many as 63 virtual consoles (virtual terminals)
• Some of these are setup to allow login, others act as graphical displays.
• To switch between virtual consoles, hold control and alt keys down and press the function key that corresponds to the terminal you want to view.
• The system console is when you press control-alt-f1
Working from the Command Line

• UNIX and Linux provided only CLI (command-line (textual) interface) before the introduction of the GUI
• The administrator will have to use CLI in many cases because:
  o A graphical equivalent does not exist
  o Or the graphical tool is not as powerful or flexible as the textual one
Correcting Mistakes

• **Erasing a character**: the default key is the `BACKSPACE`. If it does not work try the `DELETE` or `CONTROL-H`. If still does not work, then issue the command:
  - `$ stty ek`
  To set the erase and line kill keys to their default values

• **Deleting a word**: delete a word you entered by pressing `CONTROL-W`

**Tip**: `CONTROL-Z` suspends a program: give the command `fg` to continue your job in the foreground, and you should return to where you were before you pressed the suspend key
• **Deleting a line**: Before you press `RETURN`, you can delete the current line you are entering by pressing `CONTROL-U`. If it does not work, you can try `CONTROL-X`. If both do not work, use the `stty` command as above.

• **Aborting Execution**: Terminate a running program. Example is when you stop a program that performs a lengthy task as displaying contents of a file that is hundreds of pages or if you are doing the wrong copy.

• **Press the interrupt key**: `CONTROL-C`, or sometime it is `DELETE` or `DEL`
• If these do not work try the suspend key (\texttt{CONTROL-Z}), giving a jobs command to verify the number of the job running the program, and using kill to abort the job.

• The kill command uses \texttt{-TERM} to send a termination signal to the job you specified by the job number (preceded by the percent sign).

• When the terminal interrupt signal does not work, use the kill \texttt{(-KILL)} signal which \texttt{CANNOT} be ignored by the running program.

\begin{verbatim}
$ bigjob
^Z
[1]+  Stopped  bigjob
$ jobs
[1]+  Stopped  bigjob
$ kill -TERM %1
$ RETURN
[1]+  Killed  bigjob
\end{verbatim}
Repeating/Editing Command Lines

• Use the UP ARROW