# Ubuntu

Ubuntu is a Linux operating system OS. We will use it to complete encryption exercises. You will need to understand some basic OS commands to do your encryption work. You can use the machine in room D04 which have Ubuntu installed as their OS or in a BYOD lab you can install Ubuntu on your own machine.

# Different options to install Ubuntu

1. Install Ubuntu on a Virtual Machine on your Windows laptop.

(Requires a high-spec laptop - plenty of memory and disk space)

* 1. Download VirtualBox (free virtual machine software) <https://www.virtualbox.org/wiki/Downloads>
  2. Download Ubuntu OS <https://www.ubuntu.com/download>
  3. Install VirtualBox and create a new Linux Machine.
  4. Install Ubuntu as the OS in the new machine created in the last step.

1. Install Ubuntu on a USB drive and boot from there.

Here is a link to a tutorial from Ubuntu stepping you through the process <https://tutorials.ubuntu.com/tutorial/tutorial-create-a-usb-stick-on-windows>

* 1. Use a USB drive with a least 2GB space available.
  2. Download Ubuntu OS for installation on a USB drive. <https://www.ubuntu.com/download>
  3. Download the Universal USB Installer software to create bootable USB sticks. <https://www.pendrivelinux.com/universal-usb-installer-easy-as-1-2-3/>
  4. Run the UUI software choosing the Ubuntu OS you have previously downloaded as the OS when prompted. **BE VERY CAREFUL IN THIS STEP WHEN CHOOOSING THE DRIVE LETTER FOR THE USB – IF YOU CHOOSE THE INCORRECT LETTER YOU MAY MAKE IT IMPOSSIBLE TO BOOT UP YOUR COMPUTER**

1. Use OpenSSL on an Apple Mac if you have access to one.

OpenSSL is pre-installed in OS X and can be run within the “Terminal” application.

# Using Ubuntu

## What is a Super User?

In all Unix systems, including Linux a Superuser is the system user who has all permissions to be able to perform administrative tasks. This can be the user root but this user is disabled in Ubuntu for security reasons. The Ubuntu way to perform admistrative tasks is to temporarily gain superuser privileges by putting the command sudo (super user do) in front of another command that requires superuser powers.Then you will be asked for your password which is identical to your login password.

## Basic Commands

You will need to be confident using the Linux OS. The following is a list of commonly used Unix commands and an explanation of each one:

|  |  |
| --- | --- |
| Command | Explanation |
| sudo | Use when you need root permissions |
| ls | Lists the files and directories of the folder you are in |
| cd | Change directory |
| cd Downloads | Change directory to the Downloads Directory |
| mkdir ComputerSecurity | Create a directory named ComputerSecurity |
| cp src dest | Copy a file and paste it to another location |
| rm file.txt | Remove a file named file.txt |
| apt-get | Installing software to run in Linux |
| grep | Find a File that you don’t know the location of |
| cat file.txt | Prints a file contents to the screen |
| clear | Clear the terminal wondow for a fresh start |
| mv src dest | Move or rename a file |
| rmdir | Remove an empty directory |
| man | Displays help |
| pwd | Print Working Directory ( tells you which directory you are in) |
| ~ | Tilde stands for you home directory |
| nano | Text Editor |

## Exercises:

1. Using the Firefox browser within Ubuntu download the following files from Moodle:
   1. *File1*
   2. *File2*
   3. *File3*
2. Open a terminal window.
3. Make sure you are a root user.
4. Identify what working directory you are in.
5. Go to the home directory and create the following directory structure:

|  |  |  |
| --- | --- | --- |
| *Yourname* | *Security* | *Symmetric* |
|  |  | *Asymmetric* |
|  | *Programming* | *Web* |
|  |  | *Mobile* |
|  | *Maths* |  |

1. In your terminal window copy and paste *File1* to your *Mobile* subdirectory. Rename the file to *programmingtips.txt*
2. In your terminal window copy and paste *File2* to your *Asymmetric* subdirectory. Rename the file to *plaintext.txt*
3. In your terminal window move *File3* to your *Maths* subdirectory. Rename the file to *mathstips.txt*
4. Print the contents of the *mathstips.txt* to screen.
5. Clear the terminal window.
6. Remove the *Mobile* subdirectory. Is this possible ? Why not?
7. Navigate to your home directory.
8. Use the help to find out what this command does: *apt-get update*

## Using the Nano text editor

To launch nano, you can either just type nano at the command prompt, optionally followed by a filename (in this case, if the file exists, it will be opened in edition mode). If the file does not exist, or if we omit the filename, nano will also be opened in edition mode but will present a blank screen for us to start typing:

$ nano testfile.txt

nano displays at the bottom of the screen several functions that are available via the indicated shortcuts (^,Ctrl key).

Ctrl + G: brings up the help menu with a complete list of functions and descriptions:

Ctrl + X: exits the current file. If changes have not been saved, they are discarded.

Ctrl + O: saves changes made to a file. It will let you save the file with the same name or a different one. Then press Enter to confirm.

Ctrl + X: exits the current file. If changes have not been saved, they are discarded.

## Exercises:

1. Create a file named electricians.txt
2. Fill it with the addresses and contact details of 2 fictional electricians.
3. Save the file and exit.
4. Edit the file electricians.txt and add a third electrician, save and exit.