ROS Installing Guide

Prepared by:

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Preface:

❖ *About the preparator:*

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Contact info: *mohammadseraj512@gmail.com*

❖ ***Before start of installation:***

1) *Storage medium (USB) at least 4 MG.*
2) *Computer specifications on which to install the ROS: 2 GHz dual core processor or better - 4 GB system memory - 22 GB of free hard drive space - Internet access is helpful.*

❖ ***This guide shows steps of ROS (Robot Operating System) installation, with pictures on Windows 7 PC's.***
Below is a simple scheme of the ROS installation stages:

Virtualbox Installation

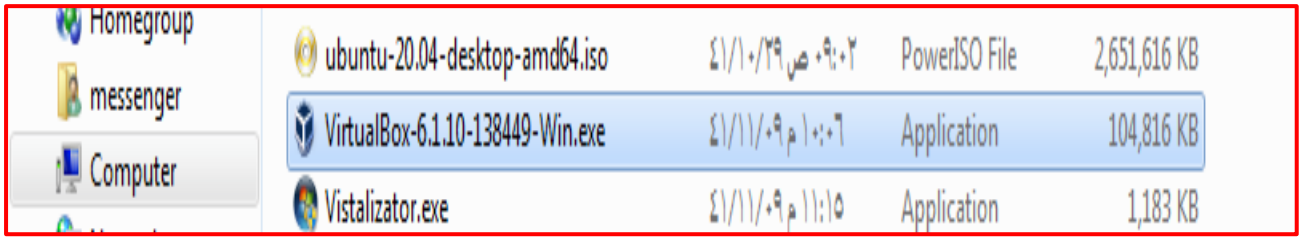
❖ ***ROS works only on Linux OS. Linux will not be installed, and works with Windows OS except by creating a virtual environment for Linux (Virtualbox).***

Note: ***Agree to allow option of any security message in your PC.***

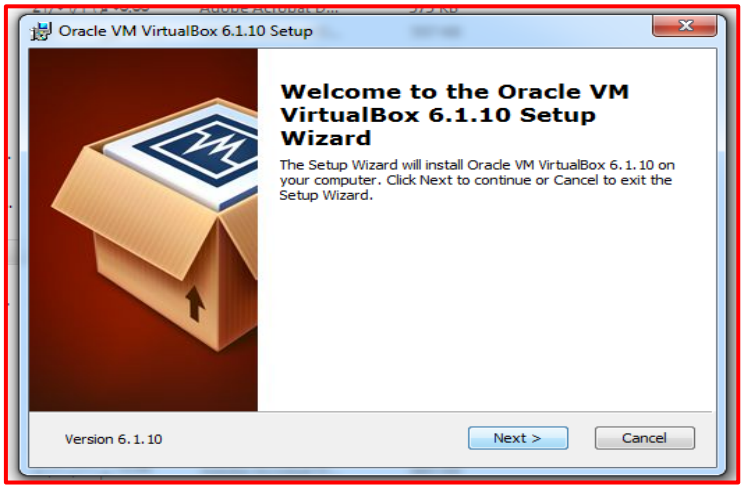
❖ ***Installation steps:***

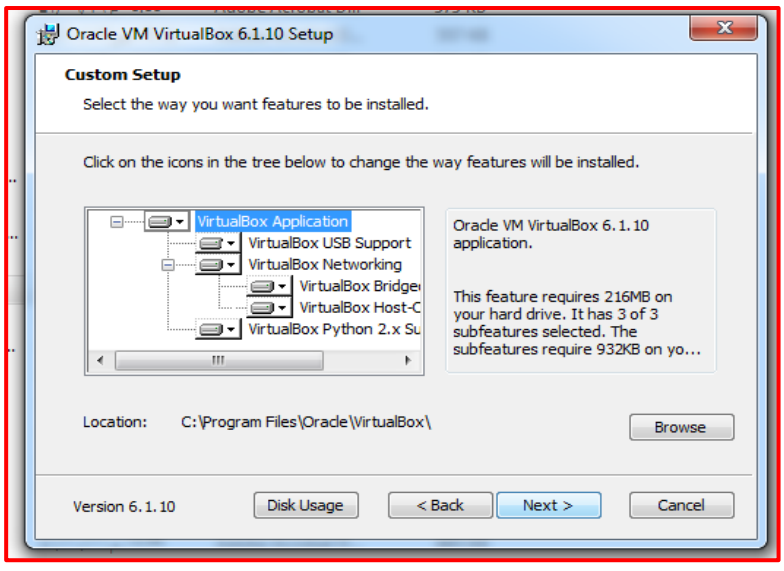
1) *Open this link to start installation:*
   https://www.virtualbox.org/wiki/Downloads
2) Then:

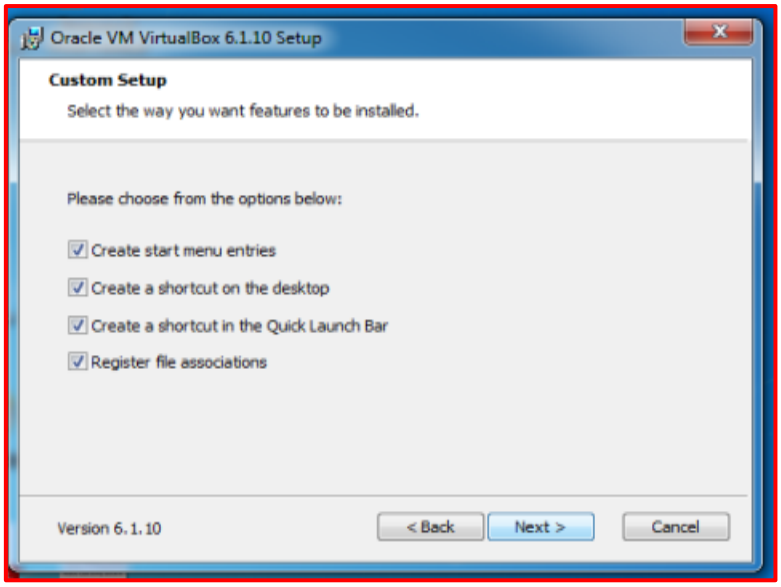
3) The direct download will start, and open the program after the download completed.



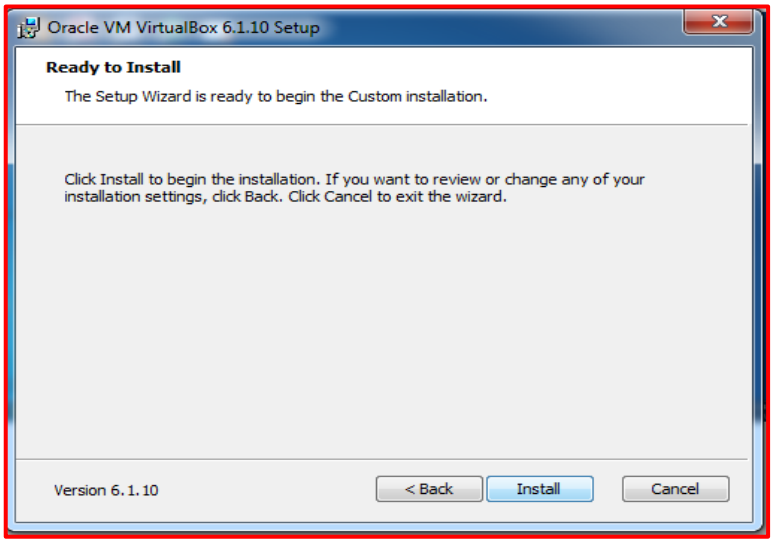
4) You will receive series of messages in a row. Just choose "Next", "Install", then "Finish". As shown below:

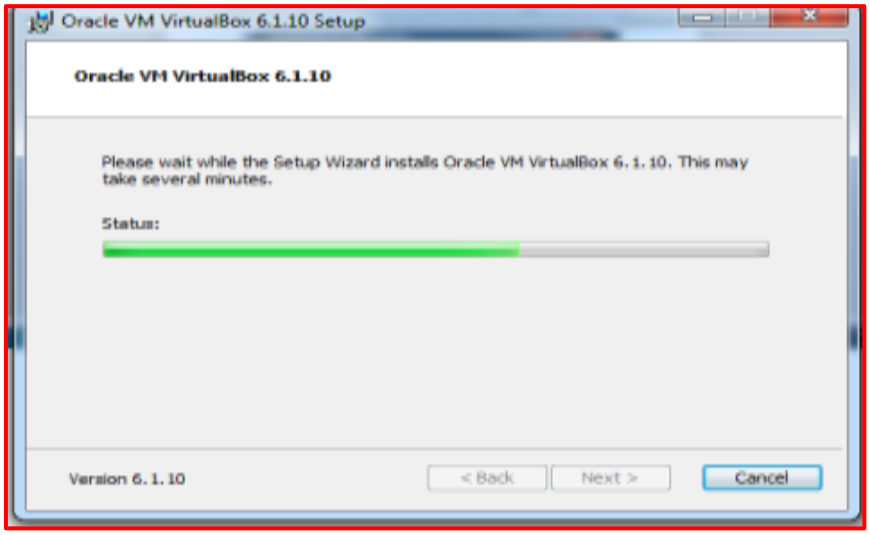


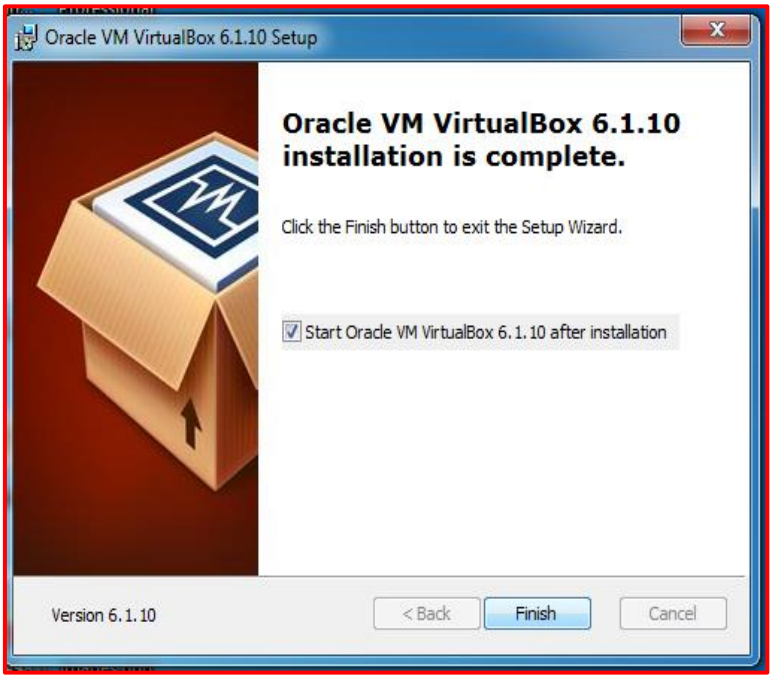


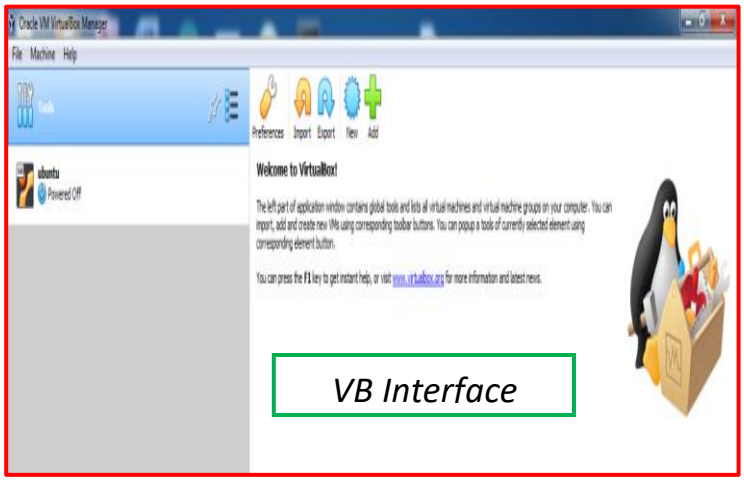

Oracle VM VirtualBox 6.1.10 Setup
Custom Setup
Select the way you want features to be installed.
Please choose from the options below:
Create start menu entries
Create a shortcut on the desktop
Create a shortcut in the Quick Launch Bar
Register file associations
Version 6.1.10
< Back
Next >
Cancel


Oracle VM VirtualBox 6.1.10
Warning:
Network Interfaces
Installing the Oracle VM VirtualBox 6.1.10 Networking feature will reset your network connection and temporarily disconnect you from the network.
Proceed with installation now?
Version 6.1.10
Yes
No


Oracle VM VirtualBox 6.1.10 Setup
Ready to Install
The Setup Wizard is ready to begin the Custom installation.
Click Install to begin the installation. If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
Version 6.1.10
< Back
Install
Cancel







VB Interface

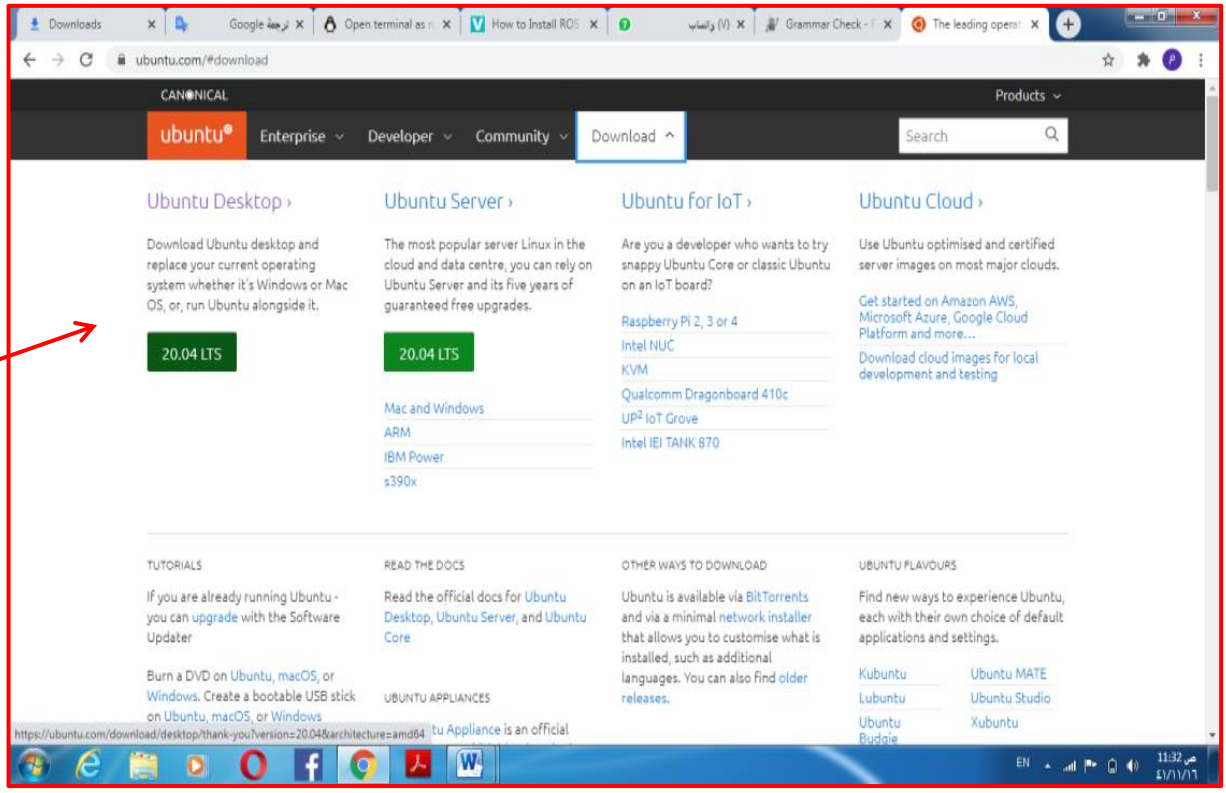
Ubuntu 20.04 Installation

❖ ***Now you can start install Linux Ubuntu 20.04 OS.***

❖ ***<u>Installing steps:</u>***

1) Open this link : https://ubuntu.com/

2) Click on " Downloads " at the top of the page, and choose " Ubuntu Desktop " as shown below:



3) The direct download will start. Then you will install it in Virtualbox.
Actually you will not be able to do that without preamble Ubuntu packages by USB (Previously mentioned).

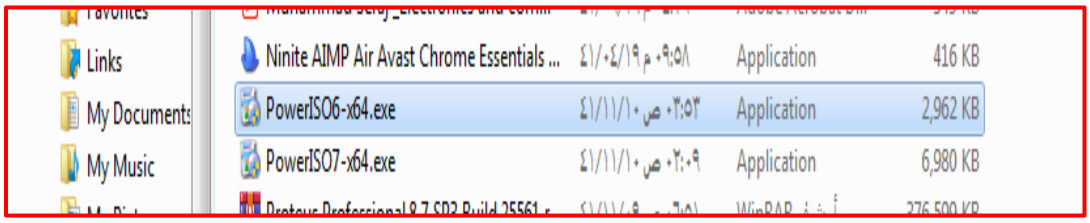
Preamble Ubuntu packages steps:

i. insert a USB in your PC.
ii. Now you will install "Poweriso" program which will

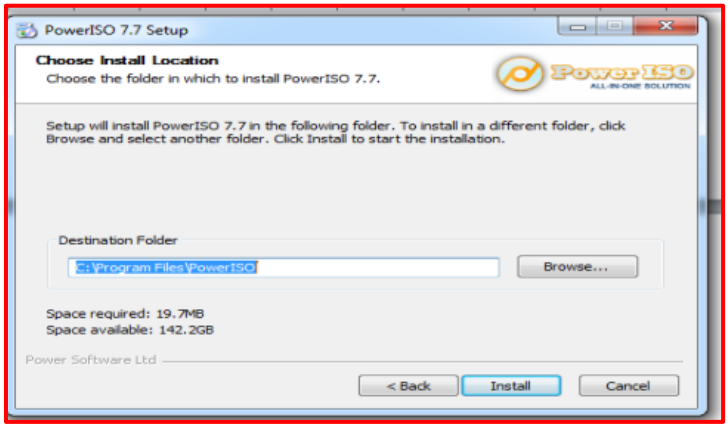
help you to implement a preamble stage correctly. SO open this link: https://www.poweriso.com/download.php

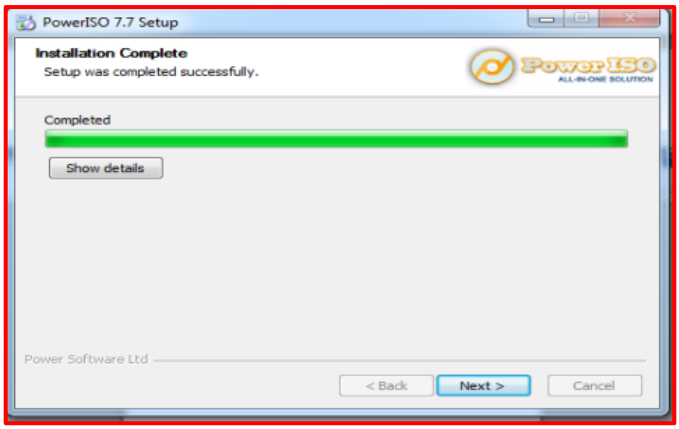
iii. Choose what is compatible with your PC specifications as shown below:

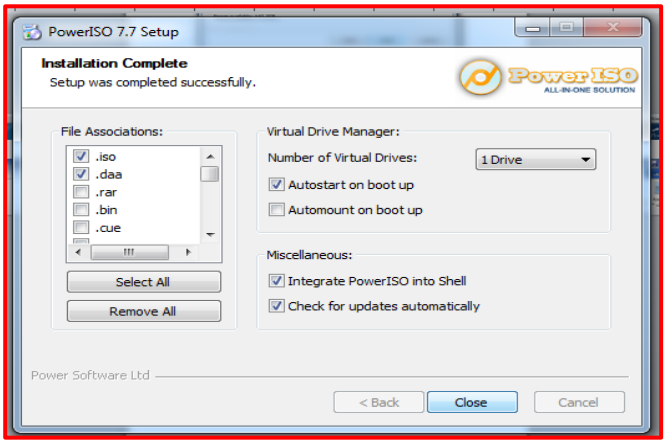
iv. The direct download will start, and open the program after the download completed.



v. You will receive series of messages in a row. Just choose "Install", "Next", then "Close". As shown below:

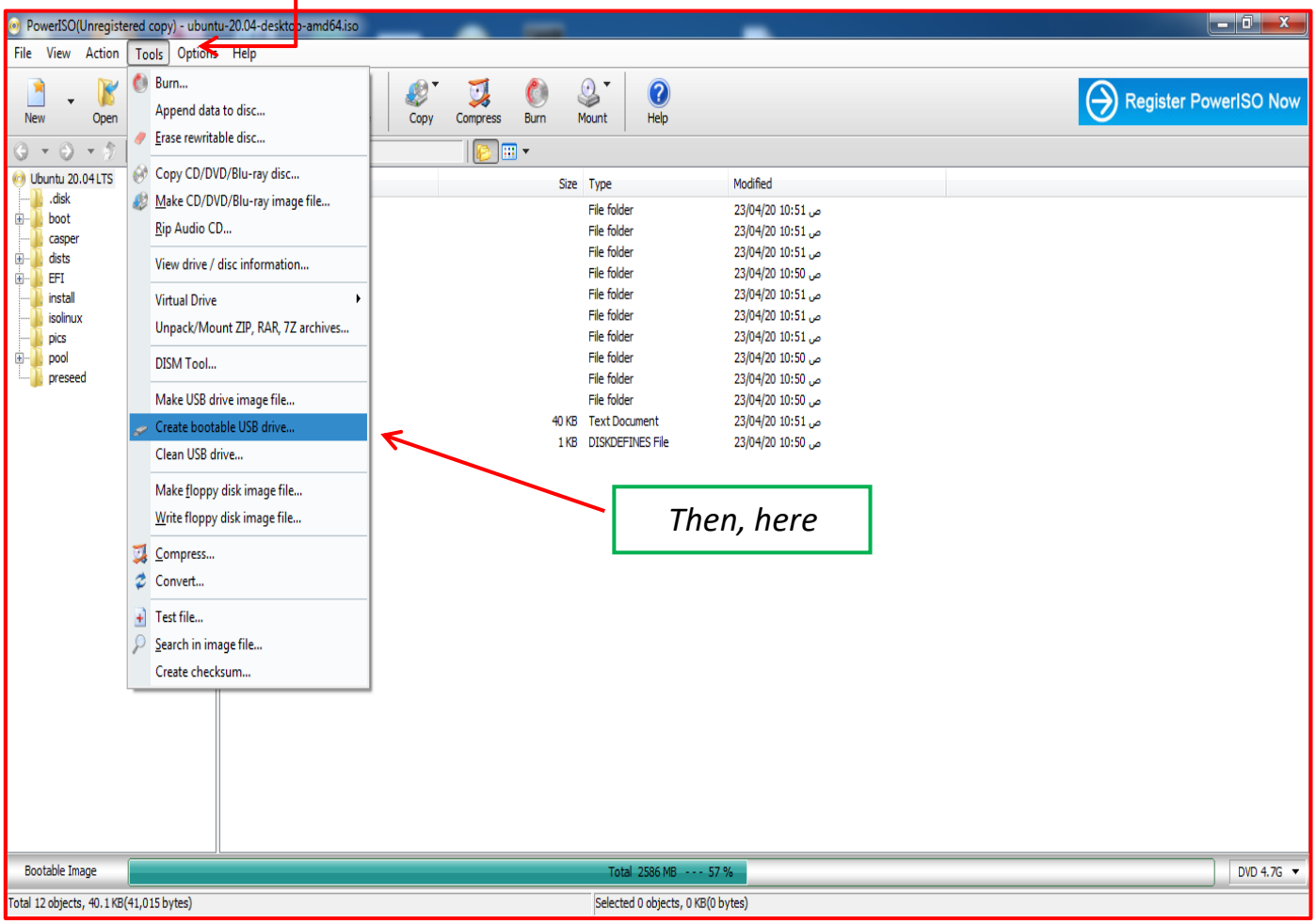






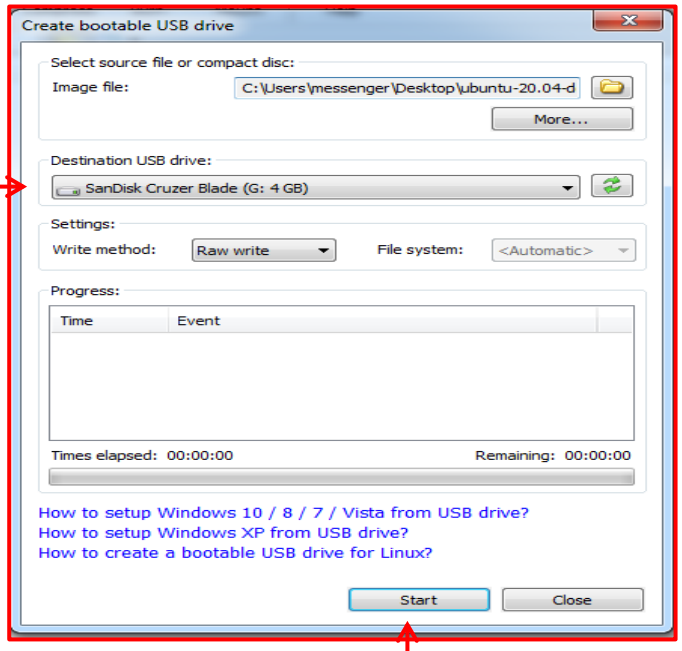
vi. Now open Ubuntu file that you previously downloaded. Then do the following steps as shown below:

First, click here " Tool "



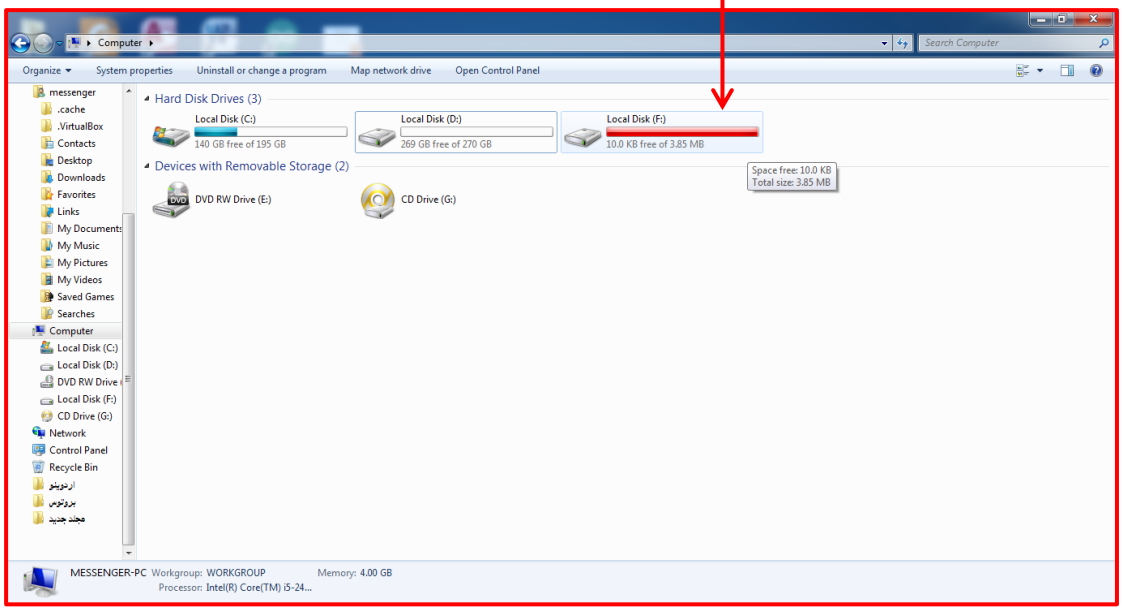
Then, here

Your USB



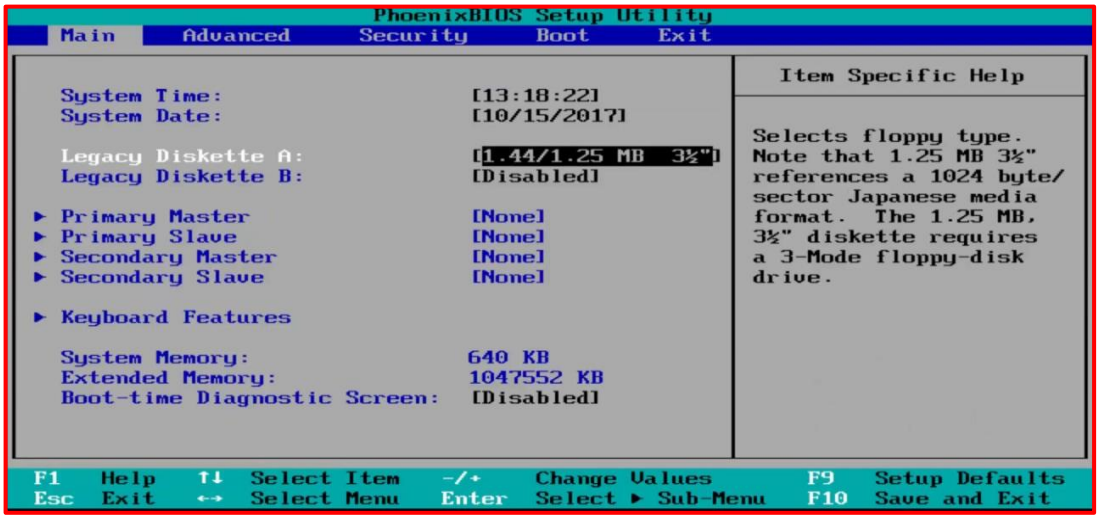
Click here

After preamble operation of USB has completed, you will see the following at "computer icon"



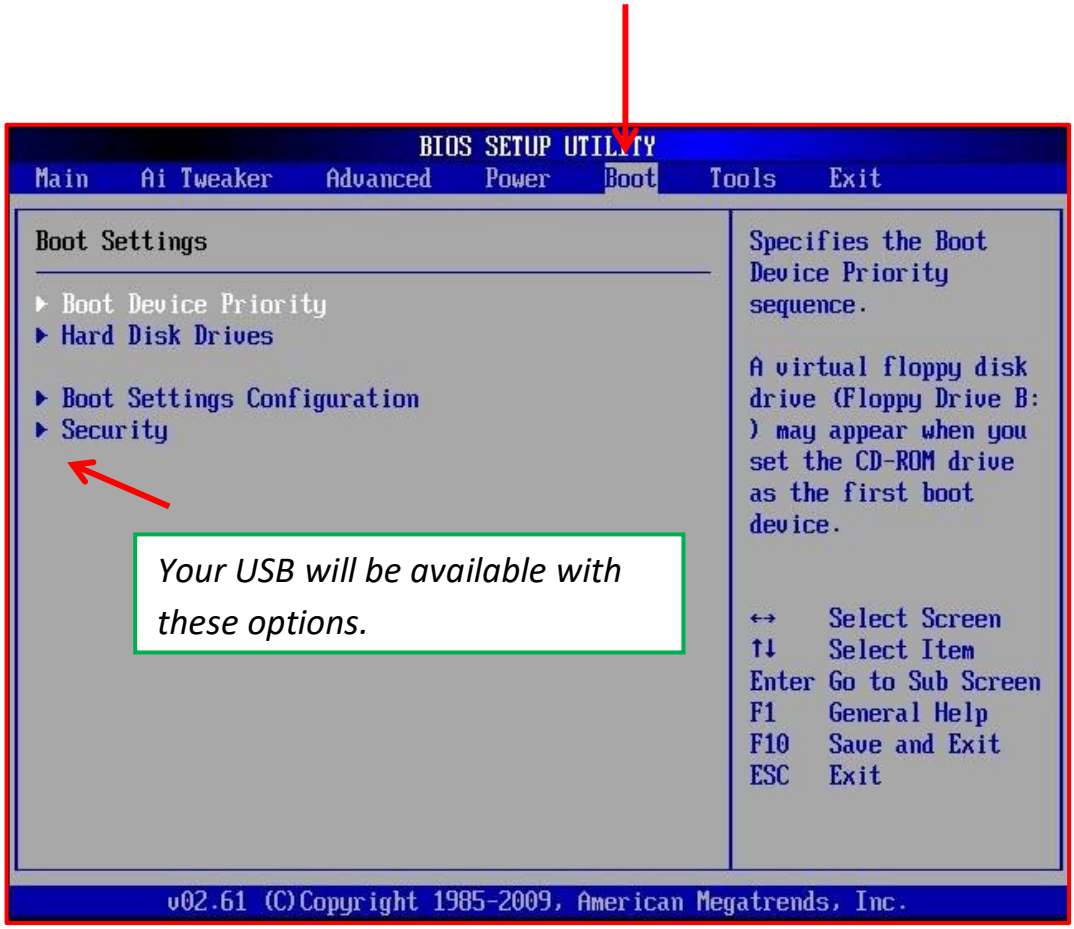
vii. Now go to BIOS sittings in your PC to make "boot" for USB.

viii. BIOS sittings stage: a) Restart your PC. b) Click on " F12 " key (It may not be useful with some PCs. Search online for the appropriate key) before "Welcome page". Then You will see the next:



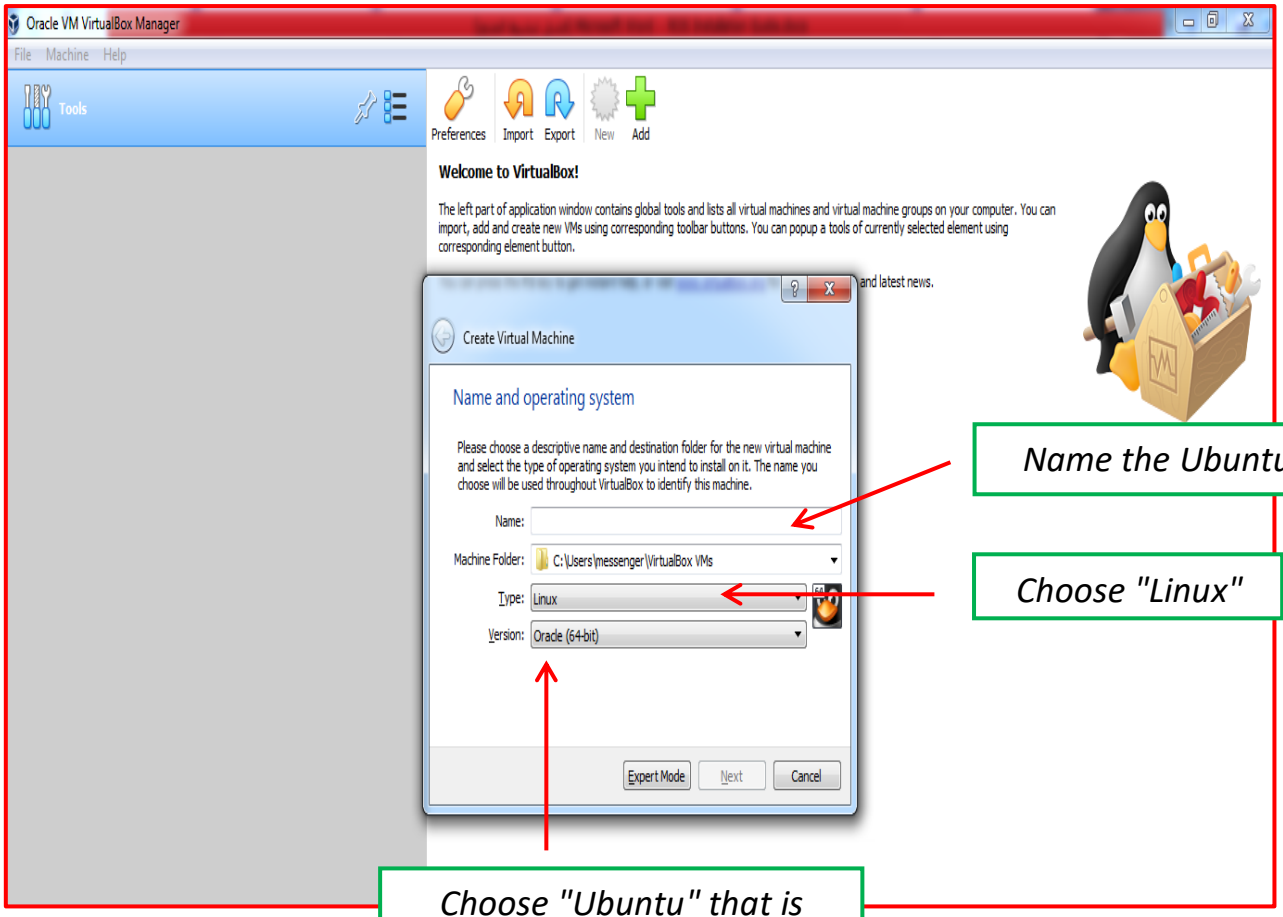
ix. Follow the BIOS page instructions for click options as shown in Previous picture.

First, click " Boot ", make the arrangement of your USB the first, "Save", finally "Exit".



4) Now start install a Ubuntu on Virtualbox.

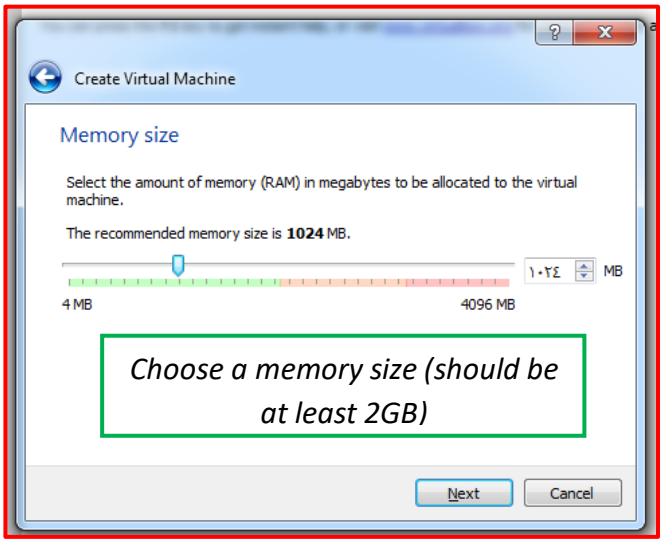
5) Open Virtualbox, then click on "New", and the following will appear:



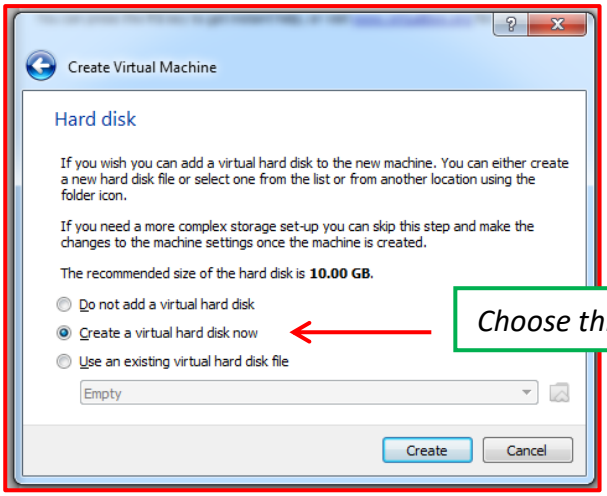
Name the Ubuntu file

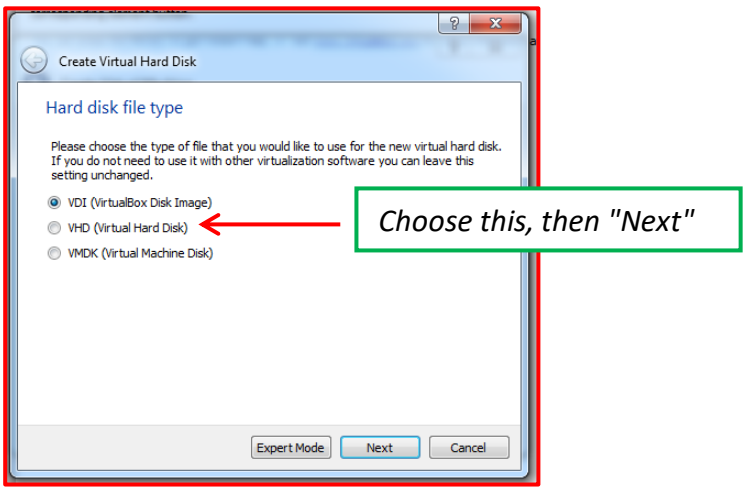
Choose "Linux"

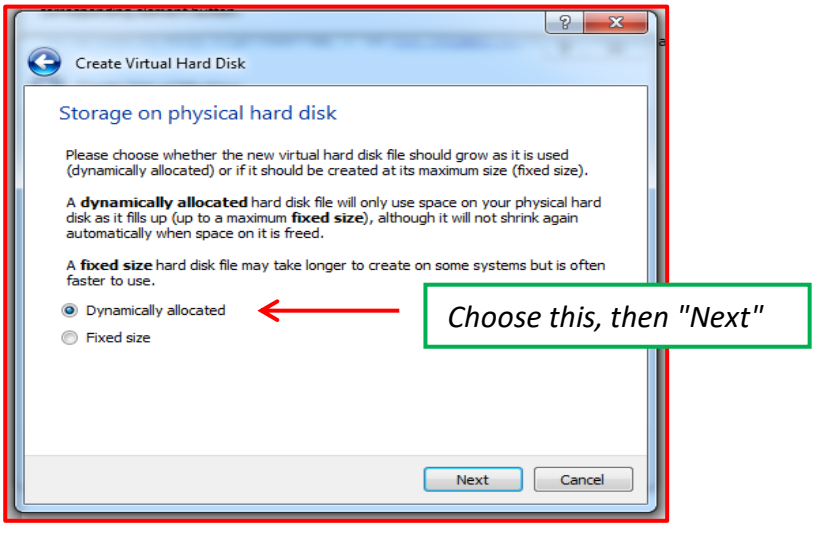
Choose "Ubuntu" that is compatible with your PC specifications "

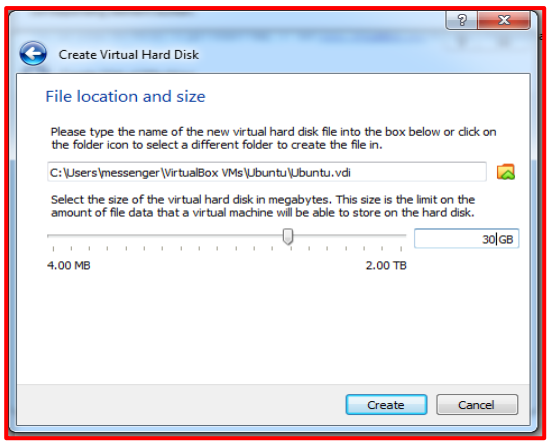


Choose a memory size (should be at least 2GB)


Create Virtual Machine
Hard disk
If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.
If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.
The recommended size of the hard disk is 10.00 GB.
Do not add a virtual hard disk
Create a virtual hard disk now
Use an existing virtual hard disk file
Empty
Create
Cancel
Choose this, then "Create"


Create Virtual Hard Disk
Hard disk file type
Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
VDI (VirtualBox Disk Image)
VHD (Virtual Hard Disk)
VMDK (Virtual Machine Disk)
Expert Mode
Next
Cancel
Choose this, then "Next"

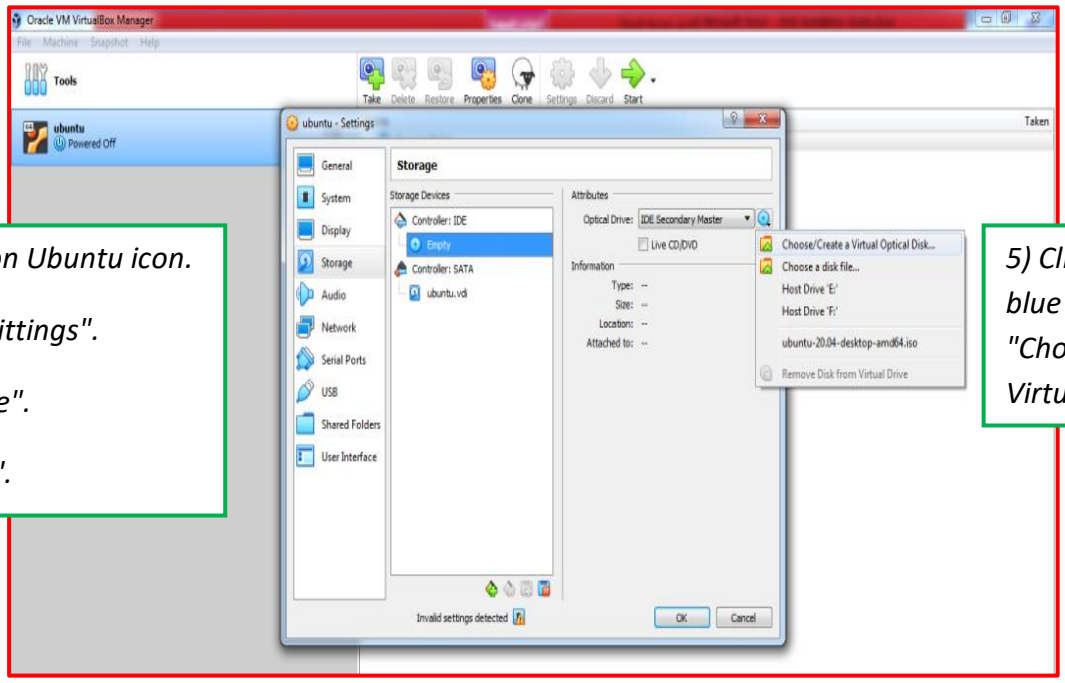

Create Virtual Hard Disk
Storage on physical hard disk
Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).
A dynamically allocated hard disk file will only use space on your physical hard disk as it fills up (up to a maximum fixed size), although it will not shrink again automatically when space on it is freed.
A fixed size hard disk file may take longer to create on some systems but is often faster to use.
Dynamically allocated
Fixed size
Next
Cancel
Choose this, then "Next"



Choose a system size (should be at least 20 GB), (The space will be consumed by your PC space).

6) Now the virtual space of Ubuntu has been created inside the virtualbox.

7) Do some simple sittings, as shown below.



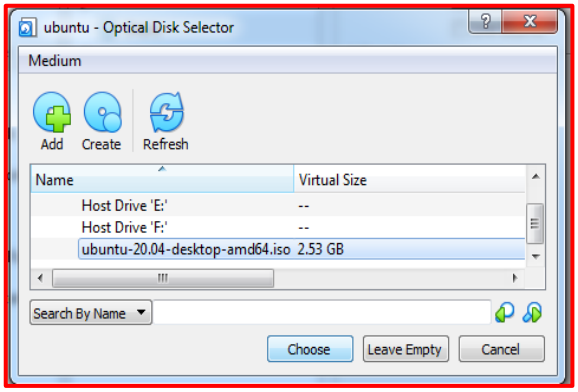
1) One click on Ubuntu icon.

2) Click on "Sittings".

3) "" "Storage".

4) "" "Empty".

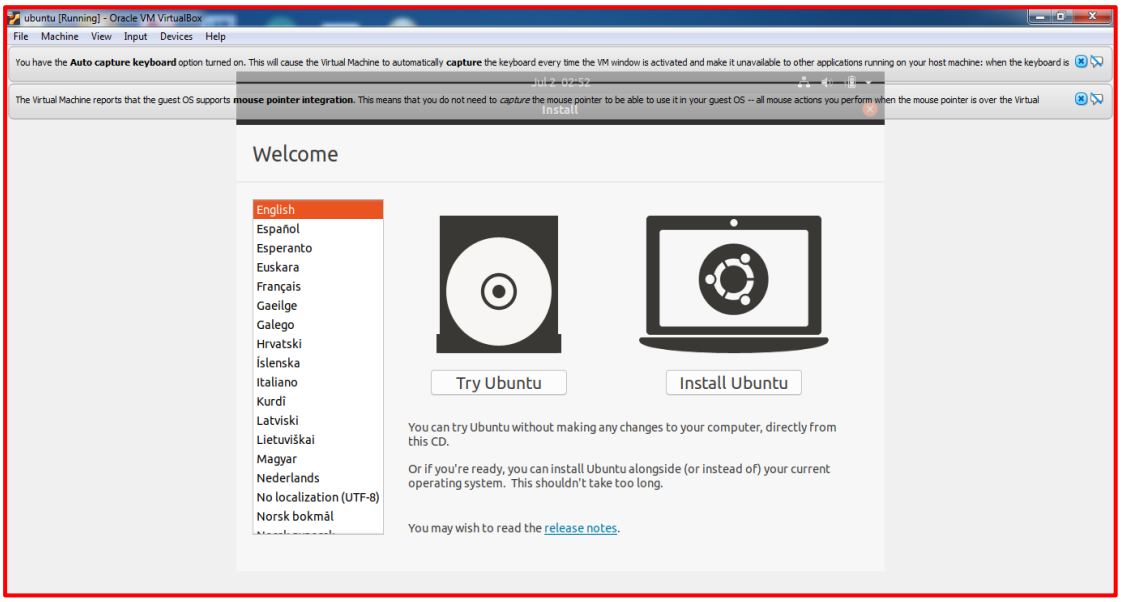
5) Click on the small blue circuit, then "Chose/Create a Virtual...



6) Chose Ubuntu file, or add it if it's not available from " Add" icon, then "Close".

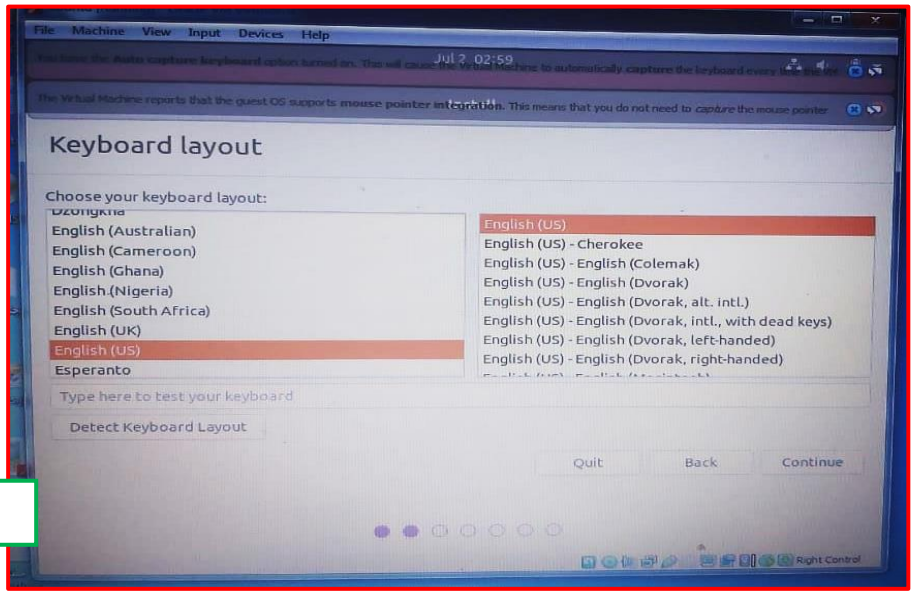
8) Run a Ubuntu by click on "Start", then will appear the following.

9) Choose the language you want, then "install Ubuntu".

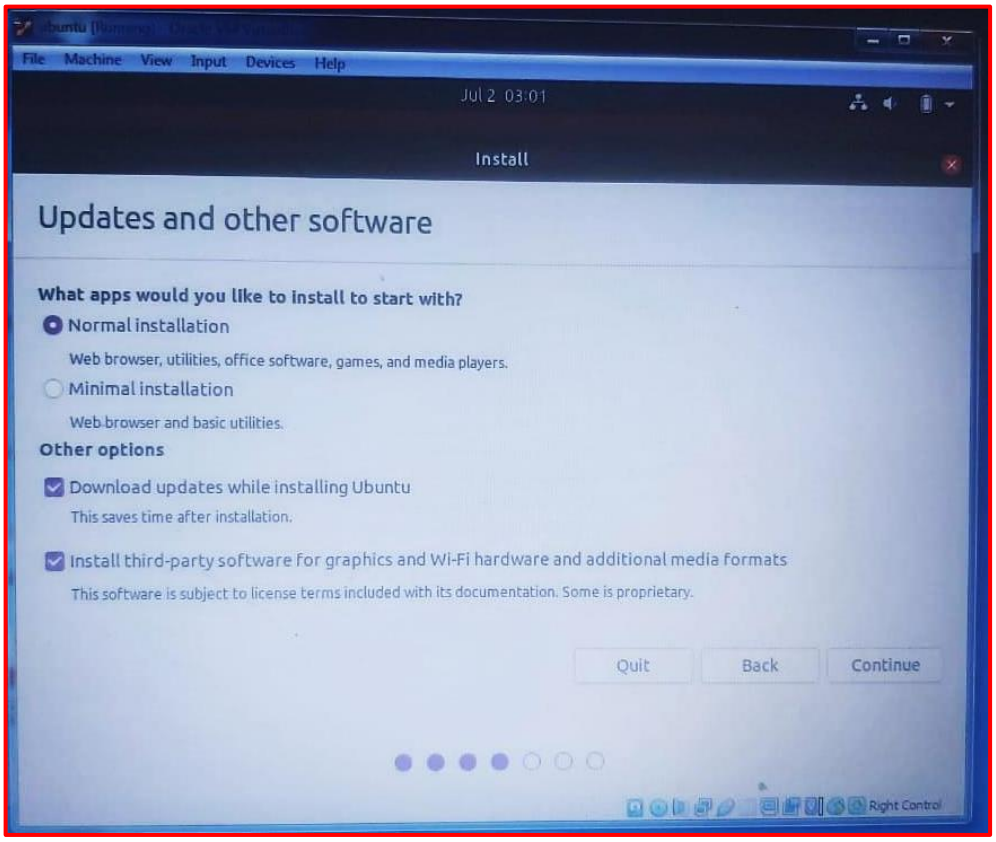


10) The following pictures were not taken by screen capture feature due to one of Ubuntu settings. You can search online to solve this problem.

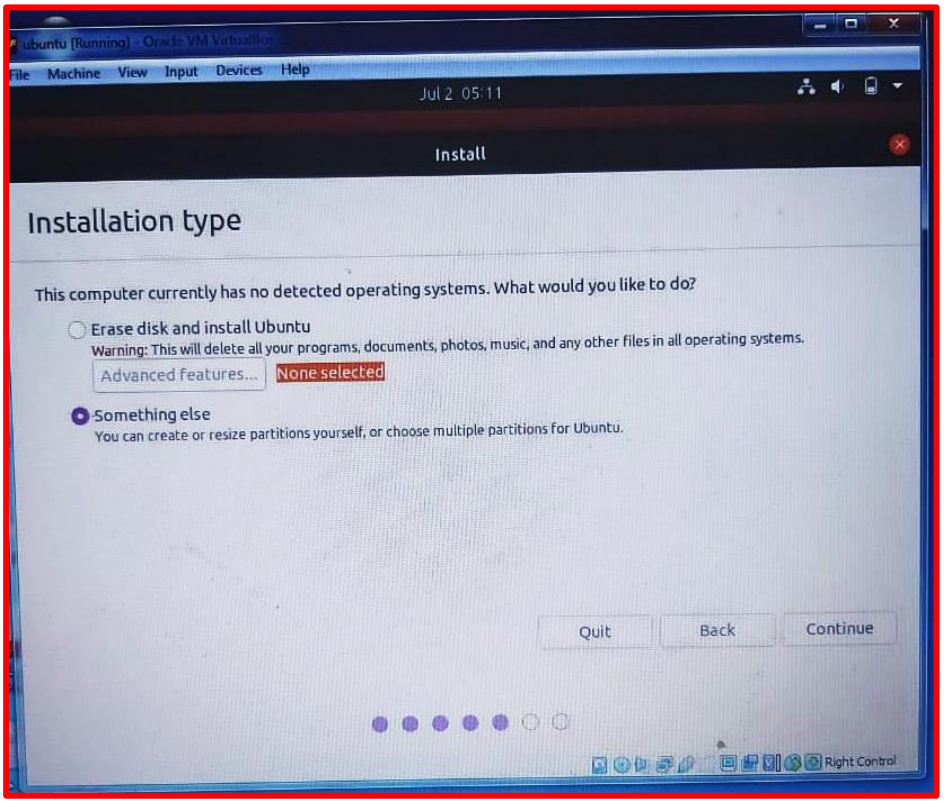
11) You will receive series of pages in a row. Just choose the shown options, then "Cont.". As shown below:



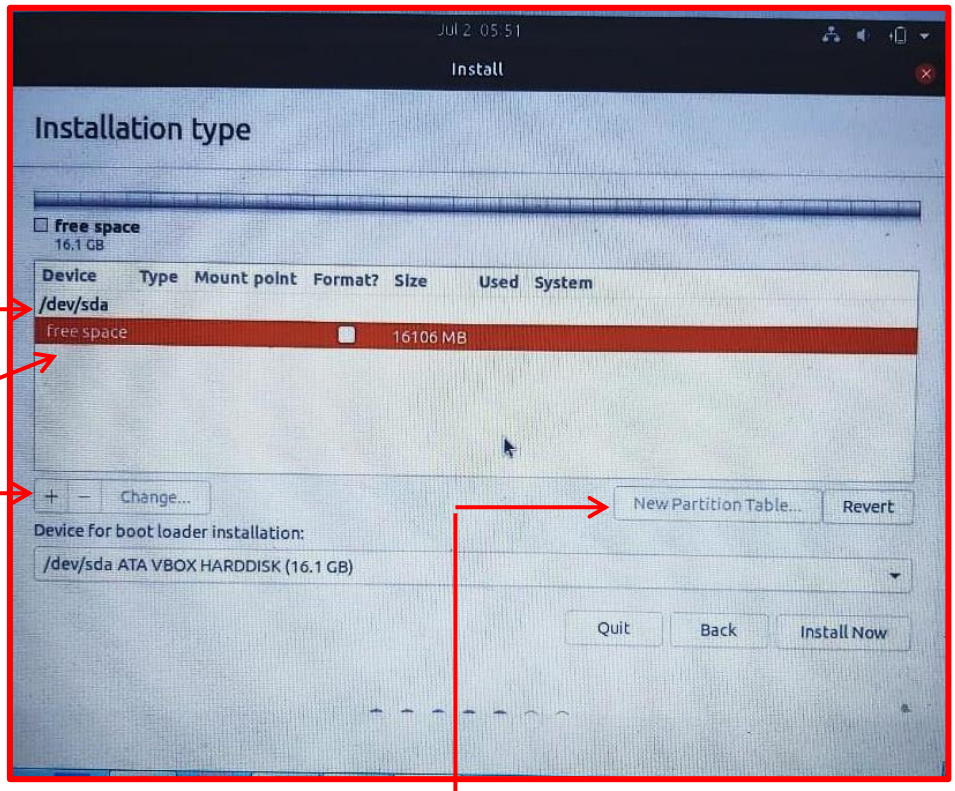
Chose a language



12) Click on "Something else" option if you would install Ubuntu with Windows, and "Erase…" if you would replace windows with Ubuntu fully as shown below:



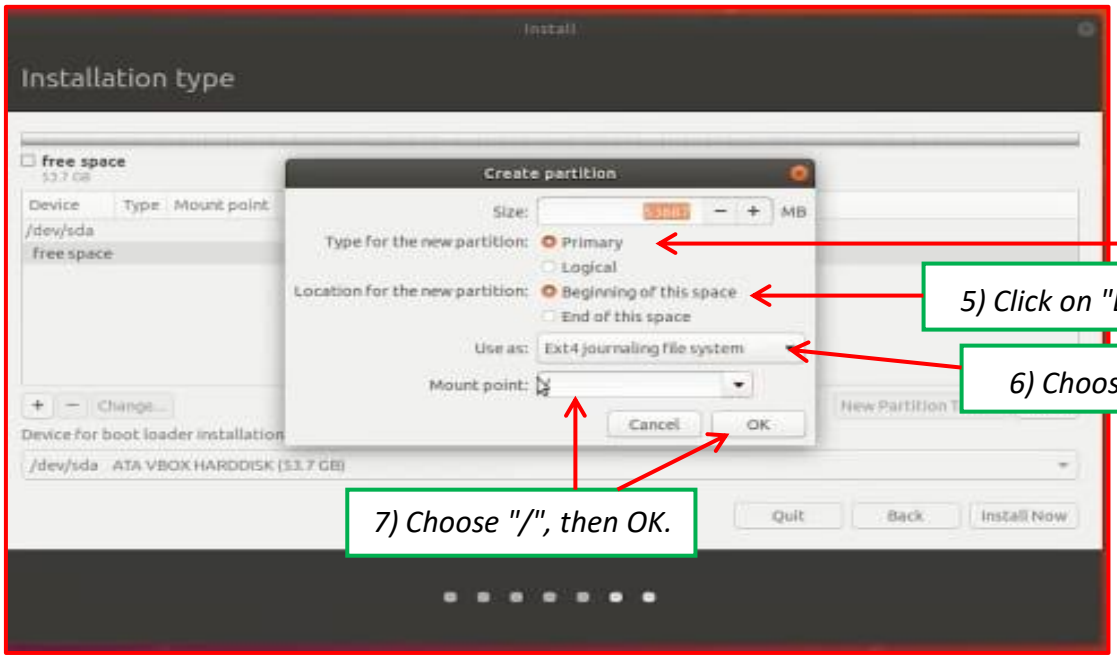
1) Edit on Ubuntu space by Choosing of "/dev/sds".



3) A created space. Choose it, then click on "+" to start sittinas.

2) Then click on "New Part..." to Create a space that you will edit it.

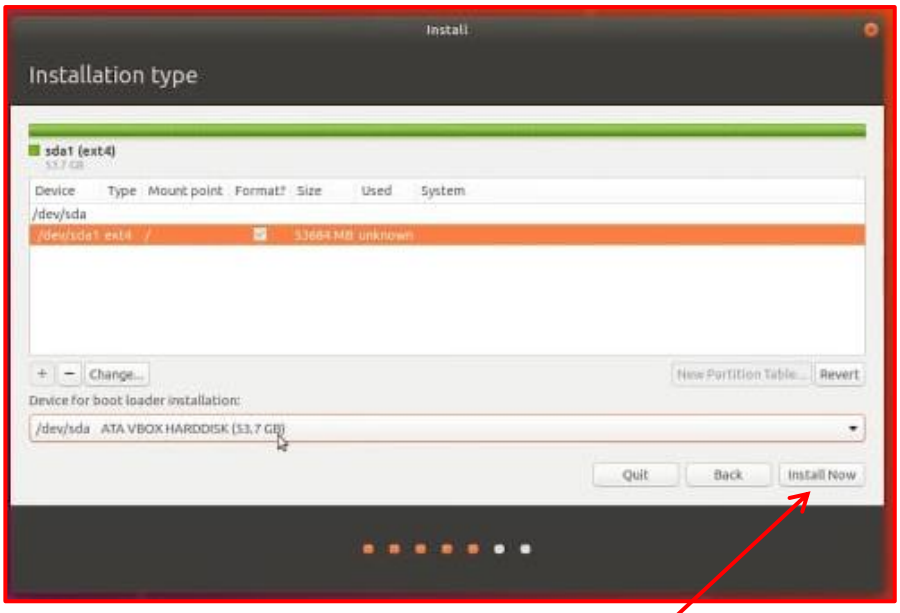
4) It will be better if you choose "Primary" .



5) Click on "Begin..." .

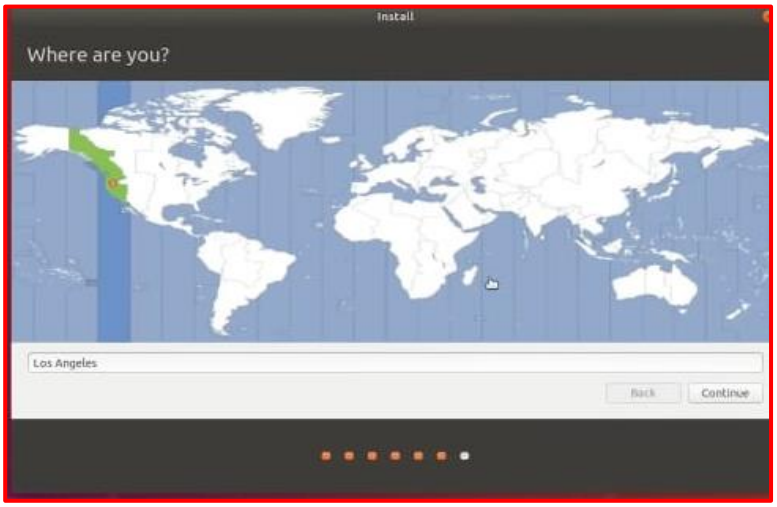
6) Choose "Ext4..." .

7) Choose "/", then OK.

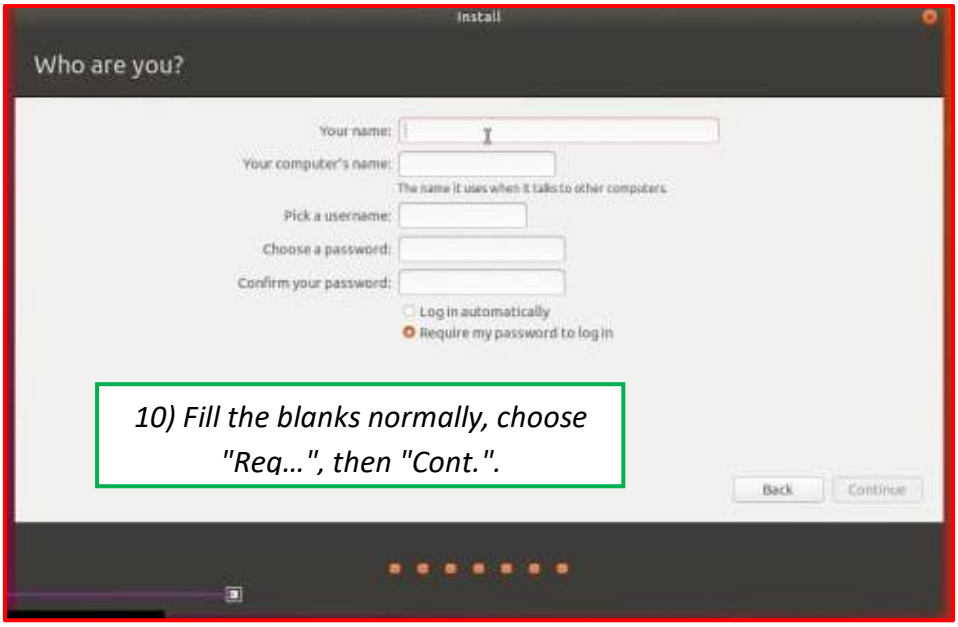


8) You will see this, then click on "Install Now".

9) Click on this.



9) Choose your area.



10) Fill the blanks normally, choose "Req…", then "Cont.".

13) Now Ubuntu will start an installation.

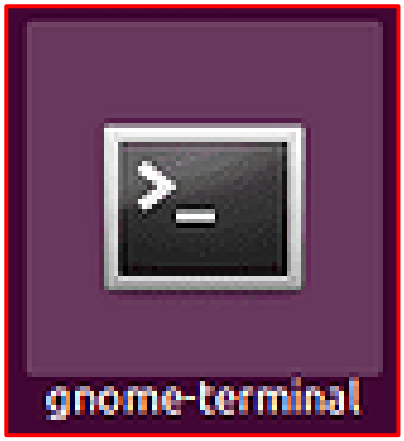
14) After installation, Ubuntu will prompt you to remove USB, insert a password that you previously choose. Then you will see an Ubuntu interface as shown below:

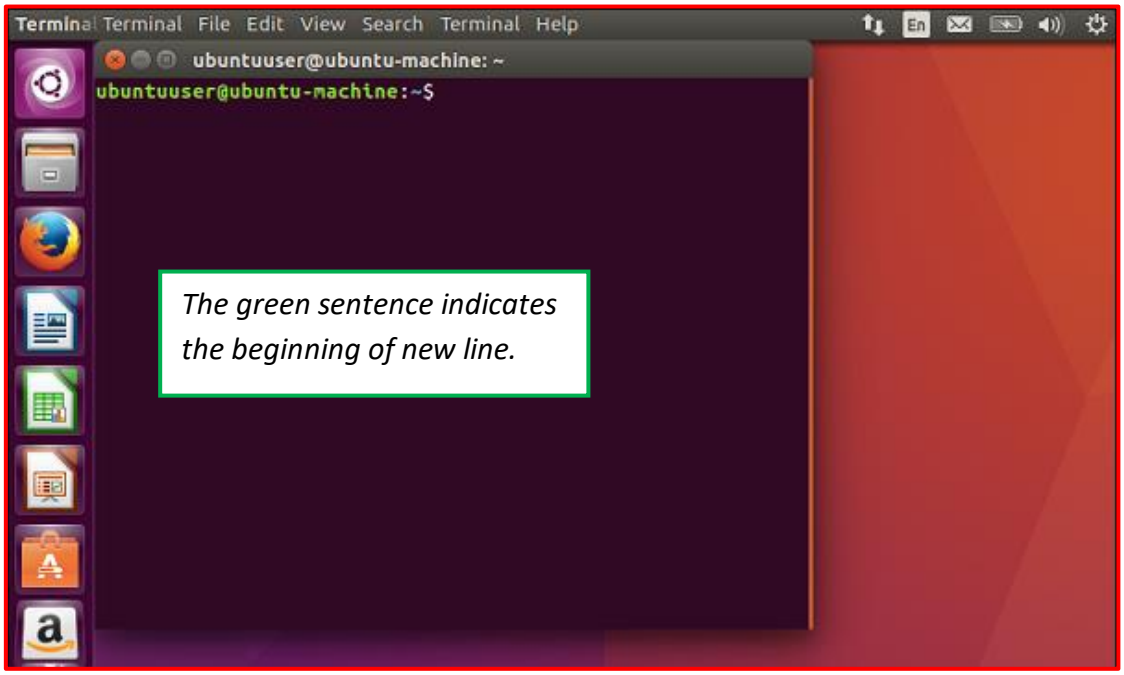
ROS Installing

Installing steps:

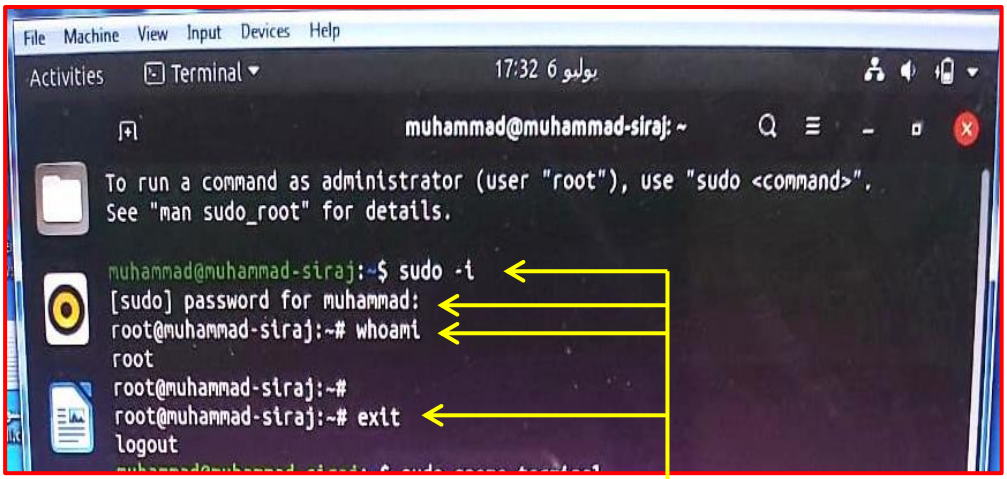
1) You will install "ROS Noetic" (It works great with "Ubuntu 20,04").

2) Search Ubuntu apps for "Terminal" as its logo shown below, and open it.





3) You need to get a root access. So write the next:



1) "Sudo –i", and click on "Enter" at your keyboard (Necessary to run any command).

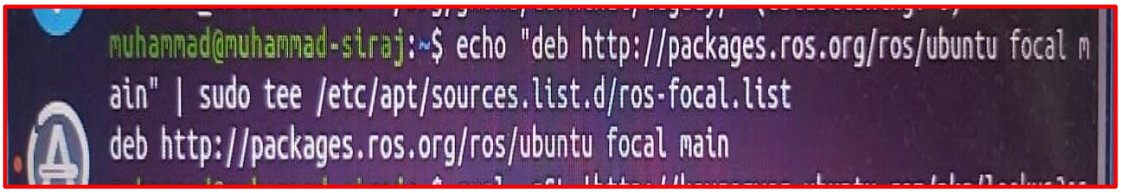
2) Write a password which is same to Ubuntu password.

3) "whoami"

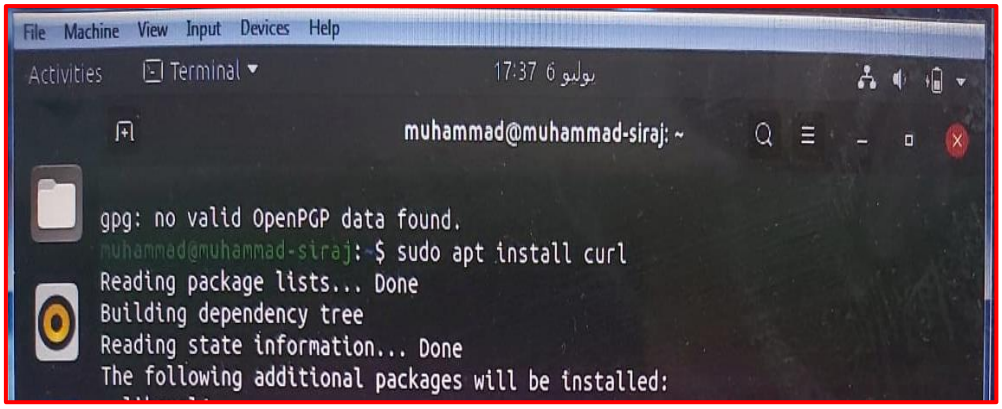
4) "exit"

5) Type " echo "deb http://packages.ros.org/ros/ubuntu focal main" | sudo tee /etc/apt/sources.list.d/ros-focal.list ".

6) After running the command above, you will see the output: ."deb http://packages.ros.org/ros/ubuntu focal main".



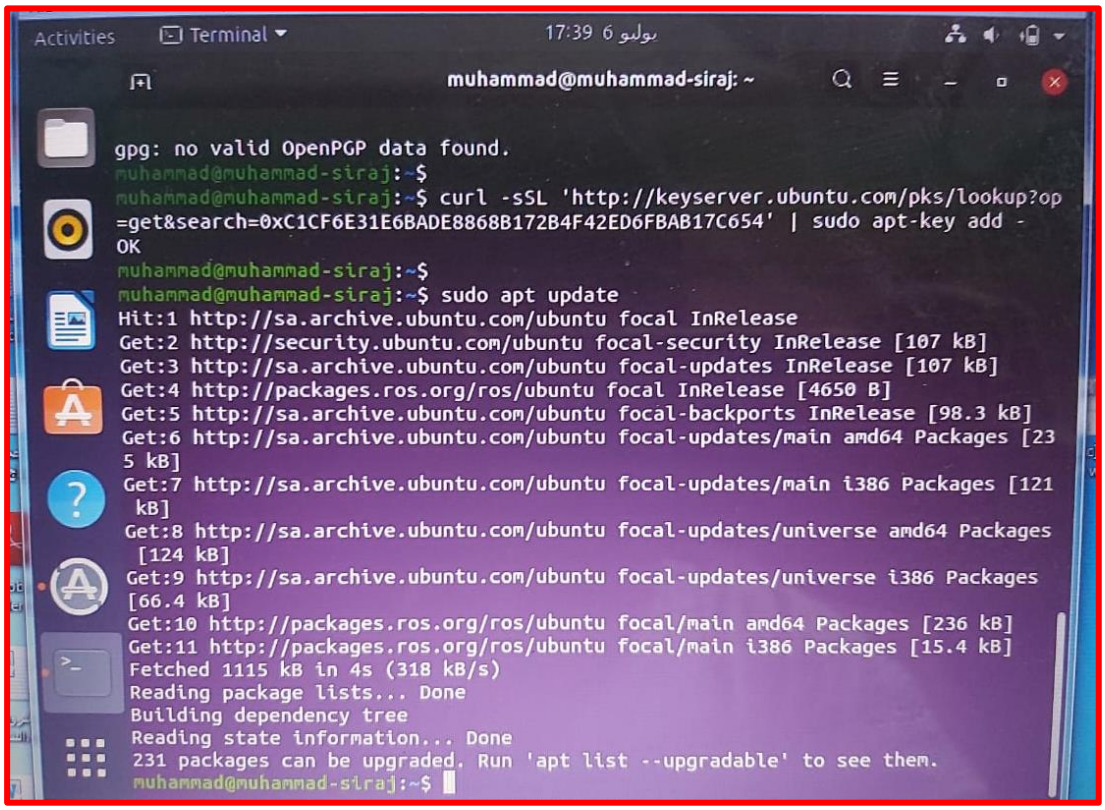
7) Write "sudo apt install curl".



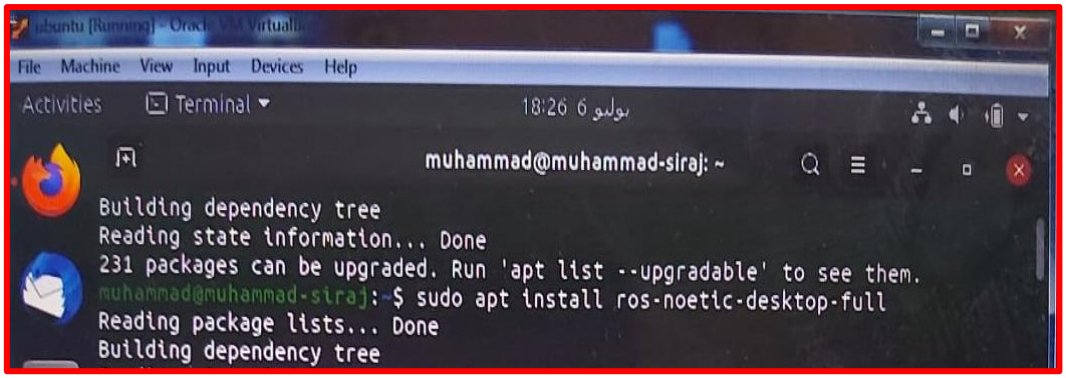
8) Write curl –sSL 'http://keyserver.ubuntu.com/pks/lookup?op=get&search=0xC1CF6E31E6BADE8868B172B4F42ED6FBAB17C6 - 54' | sudo apt-key add

You will see output “OK”

9) Type "sudo apt update".

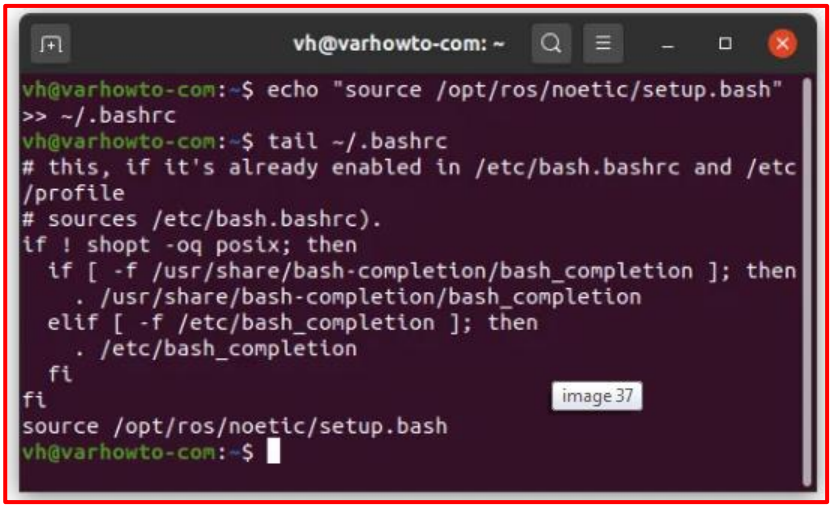


10) Write "sudo apt install ros-noetic-desktop-full", and wait about 20 minutes for the installing to finish.



11) Type "source /opt/ros/noetic/setup.bash"

12) Write "echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc"

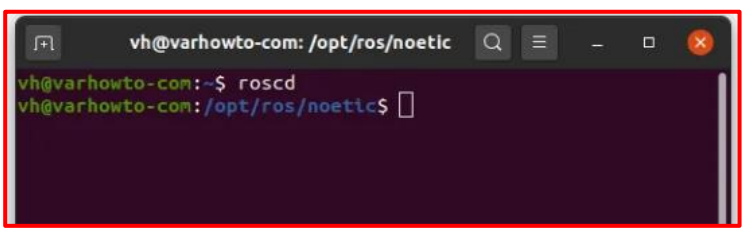


13) Type "echo "source /opt/ros/noetic/setup.zsh" >> ~/.zshrc"

14) Verify Noetic installation:

Write "roscd". '

The output:" /opt/ros/noetic"



Congratulations! you installed ROS Noetic, and you can work on it.

References

1. How to Install ROS Noetic on Ubuntu 20.04:
https://varhowto.com/install-ros-noetic-ubuntu-20-04/

2. Open terminal as root on Ubuntu 20.04 Focal Fossa:
https://linuxconfig.org/open-terminal-as-root-on-ubuntu-20-04-focal-fossa

3. How To Install Ubuntu 18.04:
https://www.youtube.com/watch?v=vt5Lu_ltPkU&feature=youtu.be

4) Ubuntu Desktop 18:
https://www.youtube.com/watch?v=5Dqi9agPCJA&t=1117s