Ros Installation Guide For Noobs From Scratch!! Considering that fact that we are using c++ code to run our package/ turtle.

### Index :

1)Installing Ubuntu  
 2)Setting Up Your Ubuntu For Ros  
 3)The Ros Installation And Basics (From Wiki Ros)

### !! All Steps Are To Be Completed In The Prescribed Order !!

1. Installing The Ubuntu Os:  
   Thinking: Why??  
   Here It Is: To Get Your Ros Running All Good And Error Free Or Atleast To Get It Debugged By Others If Required Because Everyone Else Is Running Ros In Ubuntu.  
   Also To Get Your Hands Onto Ubuntu Which You'll Be Using Extensively For The Rest Of Your Programming Life.  
   Plus To Get A Feeling Of A Core Coder (Hahaha).  
     
   A) For Those With (8+)Gb Of Ram On Their System: (Those With Less Ram Can Go To “B)” Part)  
     
    Download Virtual Box From This Link, And Install It : [Https://Download.Virtualbox.Org/Virtualbox/6.1.18/Virtualbox-6.1.18-142142-win.Exe](https://download.virtualbox.org/virtualbox/6.1.18/VirtualBox-6.1.18-142142-Win.exe)  
   Virtual Box Is A Machine That Allows You To Create A Virtual System Inside Your Real Machine.

Download Extension For Virtual Box From The Following Link And Install It:   
[Https://Download.Virtualbox.Org/Virtualbox/6.1.18/Oracle\_vm\_virtualbox\_extension\_pack-6.1.18.Vbox-extpack](https://download.virtualbox.org/virtualbox/6.1.18/Oracle_VM_VirtualBox_Extension_Pack-6.1.18.vbox-extpack)  
To Help Your Virtual Box To Use Add On Resources Of Your System And Give Access To The Same To Your Virtual Os, Like If You Insert A Pendrive It Will Be Shown In Your Virtual Ubuntu Only After This Setup.

Download The Ubuntu 20.04.1 Lts Focal Fossa Desktop Image (Just Click On The Below Mentioned Link) (2.5 Gb):  
[Https://Releases.Ubuntu.Com/20.04/Ubuntu-20.04.1-desktop-amd64.Iso](https://releases.ubuntu.com/20.04/ubuntu-20.04.1-desktop-amd64.iso)  
  
 Watch The Second Video From The Following Udemy Course (5min) (Just Click On The Below Mentioned Link) (You Might Need To Login Or Sign Up, But Hey Its Free! ):  
[Https://Download.Virtualbox.Org/Virtualbox/6.1.18/Oracle\_vm\_virtualbox\_extension\_pack-6.1.18.Vbox-extpack](https://download.virtualbox.org/virtualbox/6.1.18/Oracle_VM_VirtualBox_Extension_Pack-6.1.18.vbox-extpack)  
  
Tip: Allot Only About 40% To 45% Of Your Total Ram To This Virtual Machine (You Will Understand This Only If You Have Completed The Above Steps). Also Allot About 40 Gb Of Storage And It Should Work Just Fine.

To Get Your Small Ubuntu Window On Full Screen. Once You Are Running Your Ubuntu Then Press Right Ctrl+F And Then Press Enter.

To Now Increase The Size Of The Virtual Ubuntu System Go To Settings( On Top Right Corner Of Your Ubuntu → Clink On The Drop Down Option → Click On Settings → Click On Display Option In Settings --> Select The Resolution As 16\*\*X1\*\*\* (16x10) Option → Click On Apply → Click On Confirm).

Note: Do Remember Not To Use Your Right Ctrl In Any Shortcut Because This Is The Hotkey For Virtual Box Which Is Only Used To Give Command To Virtual Box And Not This Virtual System.  
  
B) For Those With (6 Or Less)Gb Of Ram On Their System:  
You All Guys Need To Dual Boot Your System (Dont Worry Its Not Going To Crunch Your Machine):

Dual Boot Is Just Like Putting Having Two Different Software On Your Pc With The Condition That You Can Only Use One At A Time (I Know It's Very Bad Explanation But The Point Is That While You Use One The Other Is Just Like A Big File Saved Somewhere On Your Hard Disk Which Won’t Affect The Working Of The Application You Are Currently Using)

Download The Ubuntu 20.04.1 Lts Focal Fossa Desktop Image (Just Click On The Below Mentioned Link) (2.5 Gb) :  
[Https://Releases.Ubuntu.Com/20.04/Ubuntu-20.04.1-desktop-amd64.Iso](https://releases.ubuntu.com/20.04/ubuntu-20.04.1-desktop-amd64.iso)  
  
 Download Rufus From Here (Believe Me, Your Pendrive Will Get Back Normal, We Got That Covered Too! ):  
[Https://Github.Com/Pbatard/Rufus/Releases/Download/V3.13/Rufus-3.13.Exe](https://github.com/pbatard/rufus/releases/download/v3.13/rufus-3.13.exe)  
  
 Watch This Video To Dual Boot Your System (It Won't Harm Your System) (It Will Run Smooth On Even Low End Systems) (You Will Love Ubuntu Very Soon For Sure) (Just Focus On Dual Boot Don't Listen To Him For Other Videos, We Have Got That Covered):  
[Https://Www.Youtube.Com/Watch?Reload=9&V=K7vns-5ffmm](https://www.youtube.com/watch?reload=9&v=k7vns-5FFmM)  
In This Video Please Focus On The Following Things:  
 The Rufus Waala Part  
 The Bios Waala Part  
 The Partition Waala Part !!! (Very Important)  
 The Part Where We Will Select “Instal Ubuntu Alongside Windows”

If There Is Some Problem With The Resolution Then Try This:

Go To Settings( On Top Right Corner Of Your Ubuntu → Clink On The Drop Down Option → Click On Settings → Click On Display Option In Settings → Select The Resolution As 16\*\*X1\*\*\* (16x10) Option → Click On Apply → Click On Confirm).  
  
--------- Finally Recovering Your Pendrive Back To Normal (Just Follow The Steps):

1)Put Your Pendrive In Your Pc.

2)Go To “This Pc” → Right Click On Your Pendrive → Click On Format → Select “Default Allocation Size” In “Allocation Size Option → Select “Fat 32 (Default)” In File System → Uncheck The “Quick Format” In Format Option.

3)Now Click On The “Start” Button.

(Sadly It Will Take About 30 Or 45 Min Even On High End Pc)

Now Assuming That All Of You Have Installed Ubuntu Either In Virtual Box Or By Dual Boot, Let’s Proceed Further To Some Prerequisites And Then We Will Go For Ros.

1. Now First Must Know What Ubuntu Is:

It’s Just Another Os (A Software Kind Of Thing That Helps You To Interact And Use Hardware Resources Of Your Pc) Like Windows But Is At The Same Time Quite Different.

When Windows Is Designed To Do Probably Anything, Ubuntu (Which Is Designed On The Framework Of Linux) Is Designed To Do Primarily Programming Or It Sector Related Work.

Hence Even When It's Not So Universal Os It's Extensively Elaborated And Customizable For Its Part Of The Job.

Here Enters The Word Terminal:

That Part Of Ubuntu Which Is Both The Heart And The Brain.

Its A Platform(An Application) To Interact With Probably Anything On Your Pc Or Over A Network (Internet Or Intranet).

Gui V/S Cui :

Gui = Graphic User Interface (The Type Of Interface Bw Us And Our Windows Os)

Cui = The Type Of Interface Which Doesn't Has Any Graphical Outlook, You Just Write Commands To Perform A Task (Things That We Do On Terminal, And If You Are Aware Enough Then Command Prompt Of Windows Also)

Now Enough For Now, Let's Set Up Our Ubuntu To Welcome Our Ros:

For All The Processes Requiring Terminal:

Just Ccp (Cut Copy Paste ) The Command On Your Ubuntu Terminal One After The Other And Press Enter And  
 Fill Your Password As And When Required Or Type Y And Press Enter If Prompted.

1. First Turn Off Of Auto Screen Inactive ( On Top Right Corner Of Your Ubuntu → Clink On The Drop Down Option → Click On Settings → Click On Brightness Setting → Click On “Never” In The “ Turn Screen Off When Inactive For:” Setting)
2. Now Open Terminal (Click On The 3x3 Dots At The Bottom Left Of Your Screen → Search Terminal In The Search Bar At The Top → Open It)

Now Add This Terminal To Your Fav List ( Right Click On The Terminal Icon At The Left Bar Of Your Screen → Click On Add To Fav). It Will Show You The Terminal On That Bar Always.

Now Run The Command (Just Copy Paste It On The Terminal And Press Enter Then Type Your Password (Remember, Type It By Your Memory Because You Won’t See It Getting Printed On The Screen. Also Type “Y” When Prompted And Then Press Enter):

Sudo apt-get update && sudo apt-get upgrade

Use This Command Whenever You Install Something New Or Basically Whenever We Add A New Repository Or Simply Every Time You Do Do Some Installation And Find Some Difficulty.

1. Install Wget Extension (Similar To “ E)” ):

sudo apt install wget

1. Download The Chrome Browser Using Terminal ( It's Much More Smooth Than The Pre Installed Mozilla):

wget <https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb>

sudo apt install ./google-chrome-stable\_current\_amd64.deb

Open It As We Opened Terminal In “ B)”

1. Now Instal Git On Your Ubuntu Which Will Help To Install Different Repositories (Something Like The Source Code Of A Program Or App) That Are Created By Open Source Community (Those Whose Base Files Are Available To Everyone For Free Throughout The Internet) And Are Then Published Over Github (A Website That Facilitate The Process Of This Kind Of Sharing). :

Sudo apt-get install git

1. Installing Sublime Text (The Code Editor )( Ccp The Command One After The Other):

wget -qO - https://download.sublimetext.com/sublimehq-pub.gpg | sudo apt-key add -

echo "deb https://download.sublimetext.com/ apt/stable/" | sudo tee /etc/apt/sources.list.d/sublime-text.list

sudo apt-get update

sudo apt-get install sublime-text

1. I Just Don’t Know Why But Put This Command And Press Enter:  
   sudo apt-get install libavcodec-dev libsdl1.2-dev xsltproc libbullet-dev libsdl1.2-dev libgoogle-glog-dev protobuf-compiler python-wstool

Now We Are All Set To Get The Ros Noetic On Our System (If You All Have Installed The Prescribed Ubuntu 20.04.1

1. Now Open Chrome And Open The Following Website And Follow Along:  
    [Http://Wiki.Ros.Org/Ros/Tutorials](http://wiki.ros.org/ROS/Tutorials)  
   After each A,B,C.. Just either close all the terminal and open a new (most preferable option get things normal)  
   !!!! do read all the content that's there in this tutorial !! else all this is just useless !!
2. In The Above Mentioned Tutorial Page Go To → 1 Core Ros Tutorial → 1.1 Beginner Level → 1 Installing And Configuring Your Ros Environment.  
   In This Page Got To → Install Ros → Ros Installation Instruction  
   In This Page Click On Ros Noetic Ninjemys.  
   On This Page Click On Ubuntu.  
     
   Here We Land On The Installation Page For Noetic:  
   Ccp And Press Enter Or Write Password Or Type Y And Then Enter As And When Required:  
   → The Command Of Point 1.2 → The First Command Of Point 1.3 → The First And Second(Desktop-full) Command Of Point 1.4 → First Command Of Point 1.5 ( Don’t Worry If This One Give Some Error) → The Command Of Point 1.6 → All Three Command Of Point 1.6.1  
   Now In “2. Tutorial” Click On “Ros Tutorials” .  
     
   Go To → 1 Core Ros Tutorial → 1.1 Beginner Level →installing And Configuring Your Ros Environment → Ccp The First Command Of Point 2 And See If The Output Has The Following Two Name (Ros\_package\_path, Ros\_root) → First Three Command One After The Other Of Point 3→ Then The Second Last Command Of The Same Point 3 (It Will Most Probably Give Some Error).  
   Now Click On The “Ros File System Tutorial”.  
     
   (Now Go To The Files Of Ubuntu (Like My Computer Or This Pc) And Click On “Home” On The Left. Now Click On The Blank Space In This Folder And Press (Ctrl+H).  
   Now You Will See A “.Bashrc” File→ Open It And Move To Last Line (Line 117, 118, 119) → They Must Be The Same As Given Below (If Not Then Add The Line That Is/Are Missing) →   
   117) fi  
   118) source /opt/ros/noetic/setup.bash  
   119) source ~/catkin\_ws/devel/ setup.bash  
   Now Type “ cd “ In Your Terminal And Press Enter And Head On To The Next Step..
3. Cpp The First Command Of Point 1 (Remember To Change The <Distro> To Noetic Including <>) (Dont Worry If You See Some Error) → The Second Command ”Example:” Of Point 3.1 Which Must Return Output Like The Fourth Command Over There → Now Rest All Thing In This Page Is Just A Cross Check Sort Of Thing (Try On Your On/ Not Necessary) → At The End Of Page Click On “Creat A Package” In Point 4.  
   Now Type “ cd “ In Your Terminal And Press Enter And Head On To The Next Step..
4. Ccp The Second And Third Command (One After The Other) Of Point 3 (cd ~/catkin\_ws/src ) ,(catkin\_create\_pkg beginner\_tutorials std\_msgs rospy roscpp) → First And Second Command Of Point 4th (cd ~/catkin\_ws) , (catkin\_make) → The First Command Of Point 5.1 (catkin\_make) Which Must Return Something Similar To Wats Mention Below In That That Point → Now The Rest Are Things Related To Customization/ Personalisation , Read Them If You Wish → At The End Of The Page In Point 6.2 Click On “Build Our Ros Package”.  
   Now Type “ cd “ In Your Terminal And Press Enter And Head On To The Next Step..
5. The second command of 1.1 (remember to change kinetic to noetic) (source /opt/ros/noetic/setup.bash) →write the following commands → cd ~/catkin\_ws → catkin\_make → catkin\_make install → read the rest of the page and go to the end, click on “ros nodes”.  
   Now Type “ cd “ In Your Terminal And Press Enter And Head On To The Next Step..
6. (sudo apt-get install ros-noetic-ros-tutorials)→( cd ~/catkin\_ws) → (catkin\_make) → ( roscore ) → in new terminal (rosrun turtlesim turtlesim\_node) → in new terminal (rosrun turtlesim turtle\_teleop\_key ) → Now with this window active (means after clicking on this terminal window) Use your arrow keys to run the turtle.  
   Close all the terminal.
7. Now with this i guess your setup is complete and you are good to make anything you want.  
   Just create the package similar to the one we created named (beginners tutorial ).  
   This complete package is in (files → catkin\_wa → src → “here is your package, precisely the file that will run your robot. In our case the tutlesim”).  
     
   To freshly run any package:  
   cd ~/catkin\_ws  
   Catkin\_make  
   roscore  
   rosrun turtlesim turtlesim\_node (in new terminal)  
   rosrun <package name> Pmain (in new terminal) (in my case this was the command, not sure about yours)
8. PRO (classified) TIP :- either learn to code in ros or learn to use git and spend time in understanding the co\*e.