Installation

Setup your sources.list

Setup your computer to accept software from packages.ros.org.

```
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
```

Set up your keys

```
sudo apt install curl # if you haven't already installed curl
curl -s https://raw.githubusercontent.com/ros/rosdistro/master/ros.asc | sudo apt-key add -
```

Installation

First, make sure your Debian package index is up-to-date:

```
sudo apt update
```

Now pick how much of ROS you would like to install.

- **Desktop-Full Install: (Recommended)** : Everything in **Desktop** plus 2D/3D simulators and 2D/3D perception packages
  - `sudo apt install ros-noetic-desktop-full`
- **Desktop Install:** Everything in **ROS-Base** plus tools like rqt and rviz
  - `sudo apt install ros-noetic-desktop`
- **ROS-Base: (Bare Bones)** ROS packaging, build, and communication libraries. No GUI tools.
  - `sudo apt install ros-noetic-ros-base`

There are even more packages available in ROS. You can always install a specific package directly.

```
sudo apt install ros-noetic-PACKAGE
```

e.g.

```
sudo apt install ros-noetic-slam-gmapping
```

To find available packages, see ROS Index or use:

```
apt search ros-noetic
```

Environment setup

You must source this script in every **bash** terminal you use ROS in.

```
source /opt/ros/noetic/setup.bash
```

It can be convenient to automatically source this script every time a new shell is launched. These commands will do that for you.

Bash

If you have more than one ROS distribution installed, `~/.bashrc` must only source the `setup.bash` for the version you are currently using.

```
echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
source ~/.bashrc
```

zsh

```
echo "source /opt/ros/noetic/setup.zsh" >> ~/.zshrc
source ~/.zshrc
```

Dependencies for building packages

To install this tool and other dependencies for building ROS packages, run:

```
sudo apt install python3-rosdep python3-rosinstall python3-rosinstall-generat
or python3-wstool build-essential
```

Initialize rosdep

Before you can use many ROS tools, you will need to initialize `rosdep`. `rosdep` enables you to easily install system dependencies for source you want to compile and is required to run some core components in ROS. If you have not yet installed `rosdep`, do so as follows.

```
sudo apt install python3-rosdep
```

With the following, you can initialize `rosdep`.

```
sudo rosdep init
rosdep update
```