TECHNICAL REPORT : UTS_ROBOTIC_INSTALLING ROS2 ROLLING ON UBUNTU 22.04

NAMA : SABILLY ARTOWIBOWO

NIM : 1103204057

KELAS : TK44G7

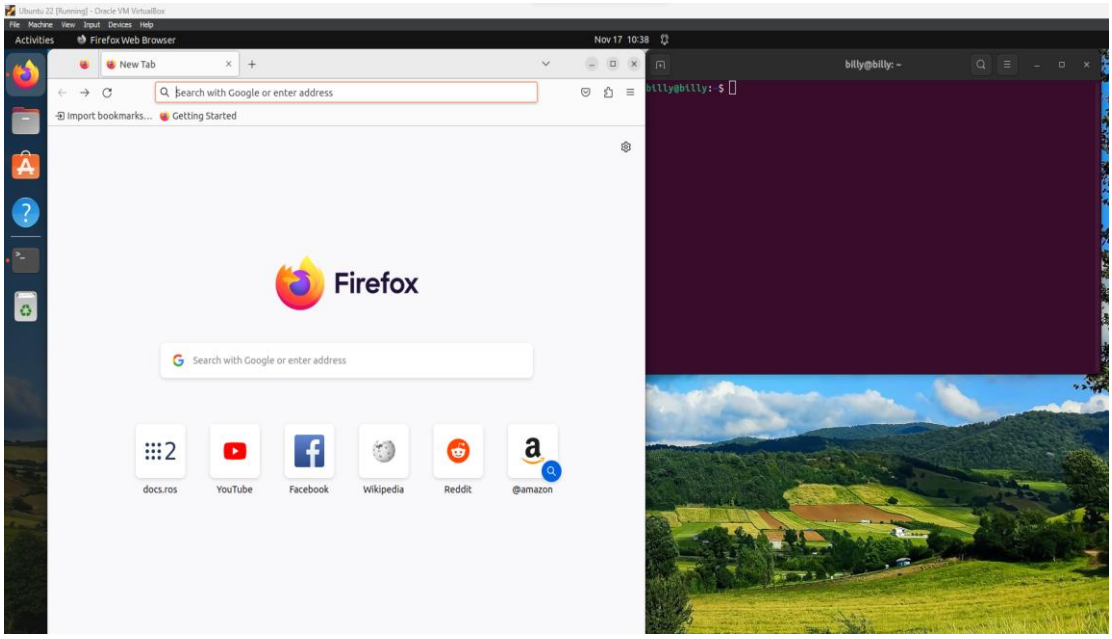
1. **ROS2 ROLLING.**

   ROS 2 (Robot Operating System 2) telah merilis beberapa versi, salah satunya adalah ROS 2 Rolling Ridley. ROS 2 Rolling adalah versi distribusi ROS 2 yang menyediakan pembaruan reguler dan terus-menerus. Versi ini dirancang untuk menyediakan pembaruan perangkat lunak yang lebih cepat dan iteratif dibandingkan dengan versi ROS 2 sebelumnya.

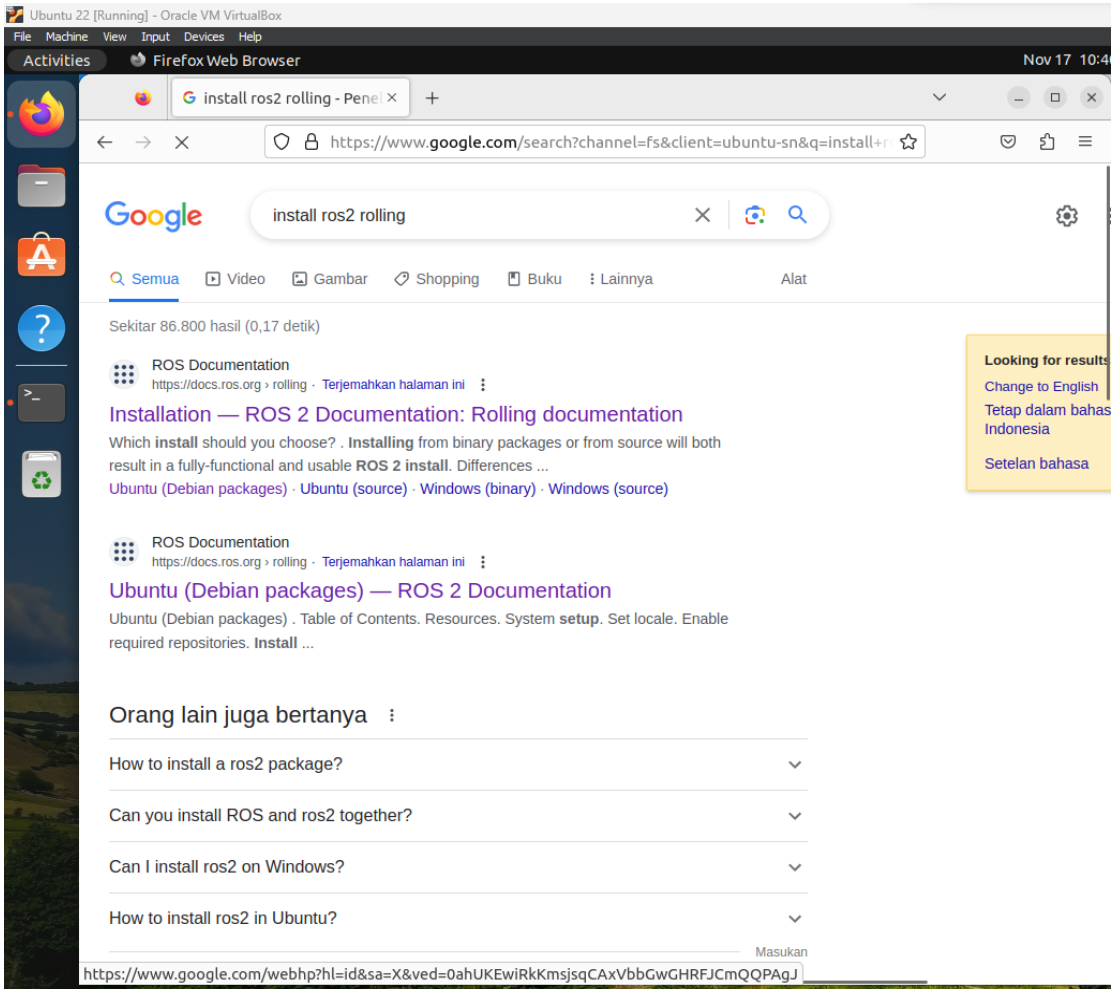
   Dengan adanya ROS 2 Rolling, pengguna dapat mengakses fitur terbaru, perbaikan bug, dan peningkatan performa secara lebih cepat karena adanya pembaruan yang kontinu. ROS 2 Rolling memungkinkan pengembang dan pengguna robot untuk menggunakan teknologi terbaru dan memperbaiki masalah yang terdeteksi dengan cepat.

2. **Step**

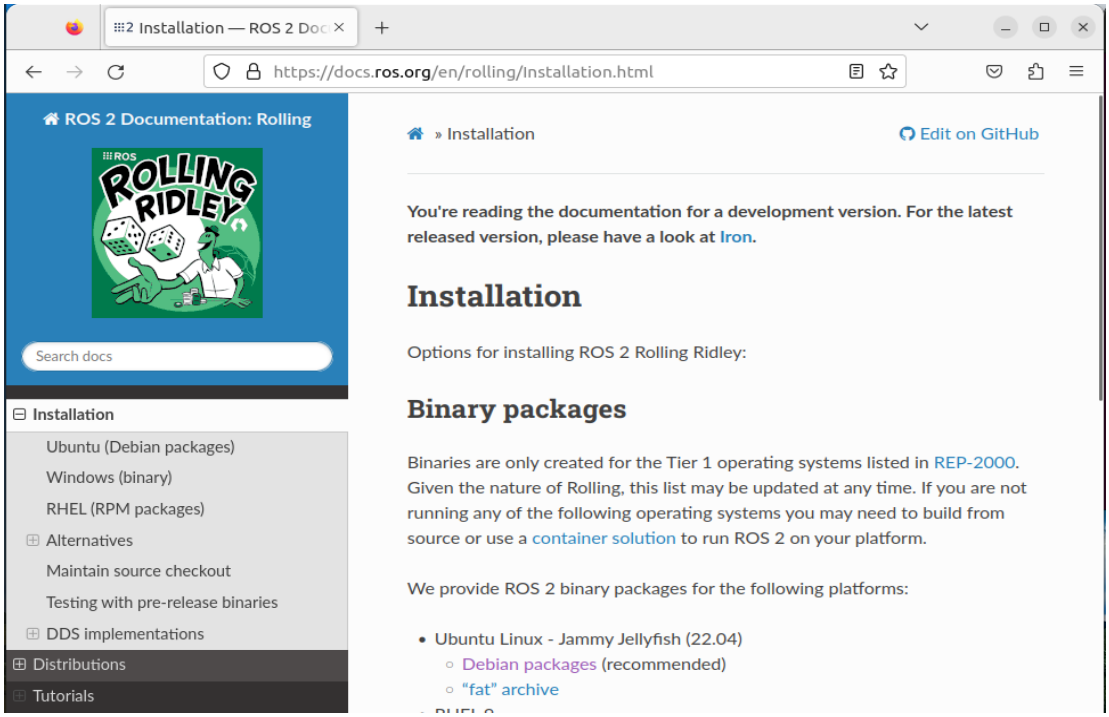
   2.1 Siapkan Virtual Machine dengan OS Ubuntu 22.04 (Jammy Jellyfish). Lalu siapkan Mozilla Firefox dan Terminal.



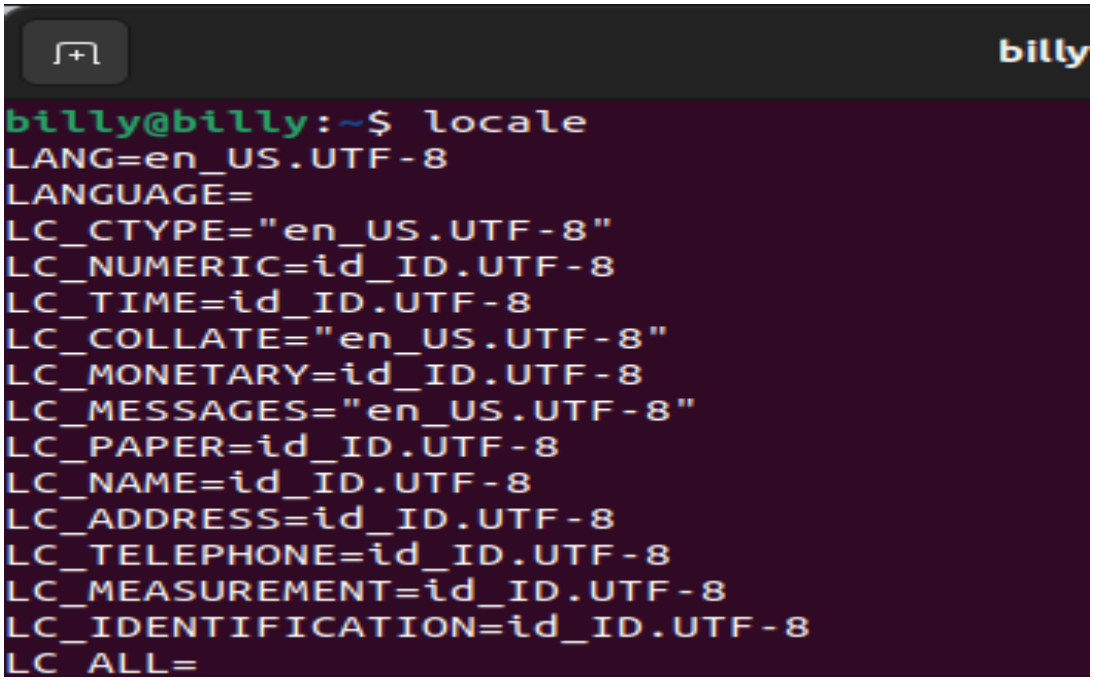
2.2 Search di Mozilla: Install ros2 rolling. Dan pilih website: Installation – ROS 2 Documentation: Rolling documentation.



2.3 Pilih Debian Package.

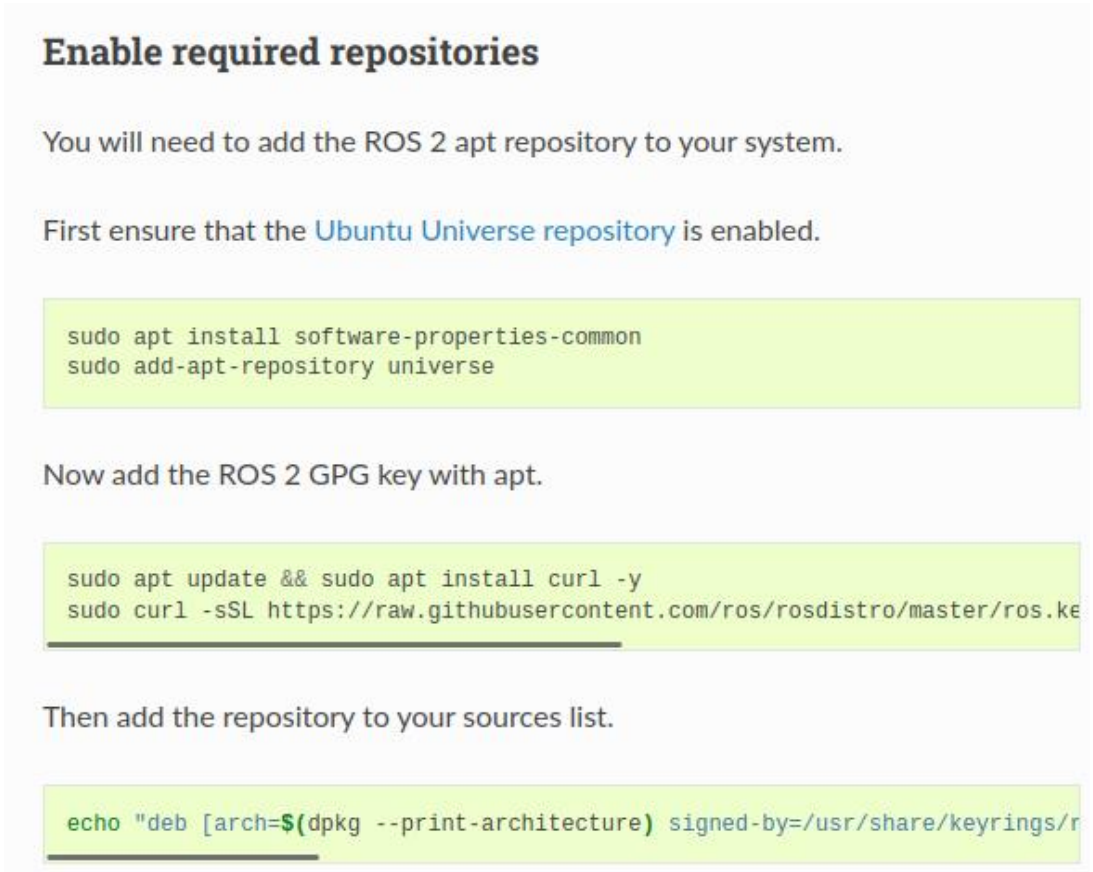


2.4 Setelah pilih Debian package, langsung saja lihat ke bagian System Setup. Disini kita akan melakukan setting locale berupa UTF-8. Pada terminal langsung saja tulis locale.



Gambar diatas artinya pada terminal saya sudah memiliki lokal UTF-8 jadi tidak perlu menjalankan perintah apapun.

2.5 Lanjut ke Enable Required Repositories. Disini kita akan menambahkan ROS2 apt repository ke sistem, lalu menambahkan key GPG ROS2 dan menambahkan repository ke list source kita.



```
billy@billy:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.7).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

```
billy@billy:~$ sudo add-apt-repository universe
Adding component(s) 'universe' to all repositories.
Press [ENTER] to continue or Ctrl-c to cancel.
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Fetched 110 kB in 2s (55,9 kB/s)
Reading package lists... Done
```

```
billy@billy:~$ sudo apt update && sudo apt install curl -y
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRele
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRe
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelea
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (7.81.0-1ubuntu1.14).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

```
billy@billy:~$ sudo curl -sSL https://raw.githubusercontent.com/ros/rosdistro/ma
ster/ros.key -o /usr/share/keyrings/ros-archive-keyring.gpg
billy@billy:~$ echo "deb [arch=$(dpkg --print-architecture) signed-by=/usr/share
/keyrings/ros-archive-keyring.gpg] http://packages.ros.org/ros2/ubuntu $(. /etc/
os-release && echo $UBUNTU_CODENAME) main" | sudo tee /etc/apt/sources.list.d/ro
s2.list > /dev/null
```

2.6 Lalu menuju bagian Install Development tools (optional). Sesuai judul sebenarnya ini opsional bagi kita tetapi dikarenakan ROS2 ini sangat berguna untuk di explore maka kita membutuhkan package ros nya.

Install development tools (optional)

If you are going to build ROS packages or otherwise do development, you can also install the development tools:

```
sudo apt update && sudo apt install ros-dev-tools
```

```
billy@billy:~$ sudo apt update && sudo apt install ros-dev-tools
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://packages.ros.org/ros2/ubuntu jammy InRelease [4.682 B]
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:6 http://packages.ros.org/ros2/ubuntu jammy/main amd64 Packages [1.394 kB]
Fetched 1.398 kB in 4s (352 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
ros-dev-tools is already the newest version (1.0.0).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

2.7 Selanjutnya langsung install ROS 2.

Install ROS 2

Update your apt repository caches after setting up the repositories.

```
sudo apt update
```

ROS 2 packages are built on frequently updated Ubuntu systems. It is always recommended that you ensure your system is up to date before installing new packages.

```
sudo apt upgrade
```

```
billy@billy:~$ sudo apt update
Hit:1 http://id.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://id.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://packages.ros.org/ros2/ubuntu jammy InRelease
Hit:4 http://id.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
billy@billy:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
Get more security updates through Ubuntu Pro with 'esm-apps' enabled:
  libjs-jquery-ui libopenexr-dev libopenexr25 python3-scipy libpostproc55
  libswscale-dev libavcodec58 libavutil56 libswscale5 libavutil-dev
  libswresample3 libavformat58 libpmix-dev libavformat-dev libavcodec-dev
  libpmix2 libswresample-dev libavfilter7
Learn more about Ubuntu Pro at https://ubuntu.com/pro
The following packages have been kept back:
  ubuntu-advantage-tools
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

2.8 Setelah melakukan instalasi ROS 2, kita akan install Desktop berupa ROS, Rviz, demos, dan tutorials.

Desktop Install (Recommended): ROS, RViz, demos, tutorials.

```
sudo apt install ros-rolling-desktop
```

Jika terdapat pesan berikut pencet saja y/Y.

```
After this operation, 204 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

Tunggu progress sampai selesai.

```
Progress: [ 26%] [###############.....................................]
```

2.9 Setelah selesai lanjut ke Setting up environment untuk membuat ros2 berjalan. Lakukan masuk ke direktori ros dengan cd /opt/ros. Lalu lakukan ls untuk melihat ada apa saja di ros tersebut. Jika ada rolling maka instalasi kita sudah benar.

```
billy@billy:~$ cd /opt/ros
billy@billy:/opt/ros$ ls
humble  rolling
```

2.10 Lakukan edit kepada file .bashrc untuk sourcing.

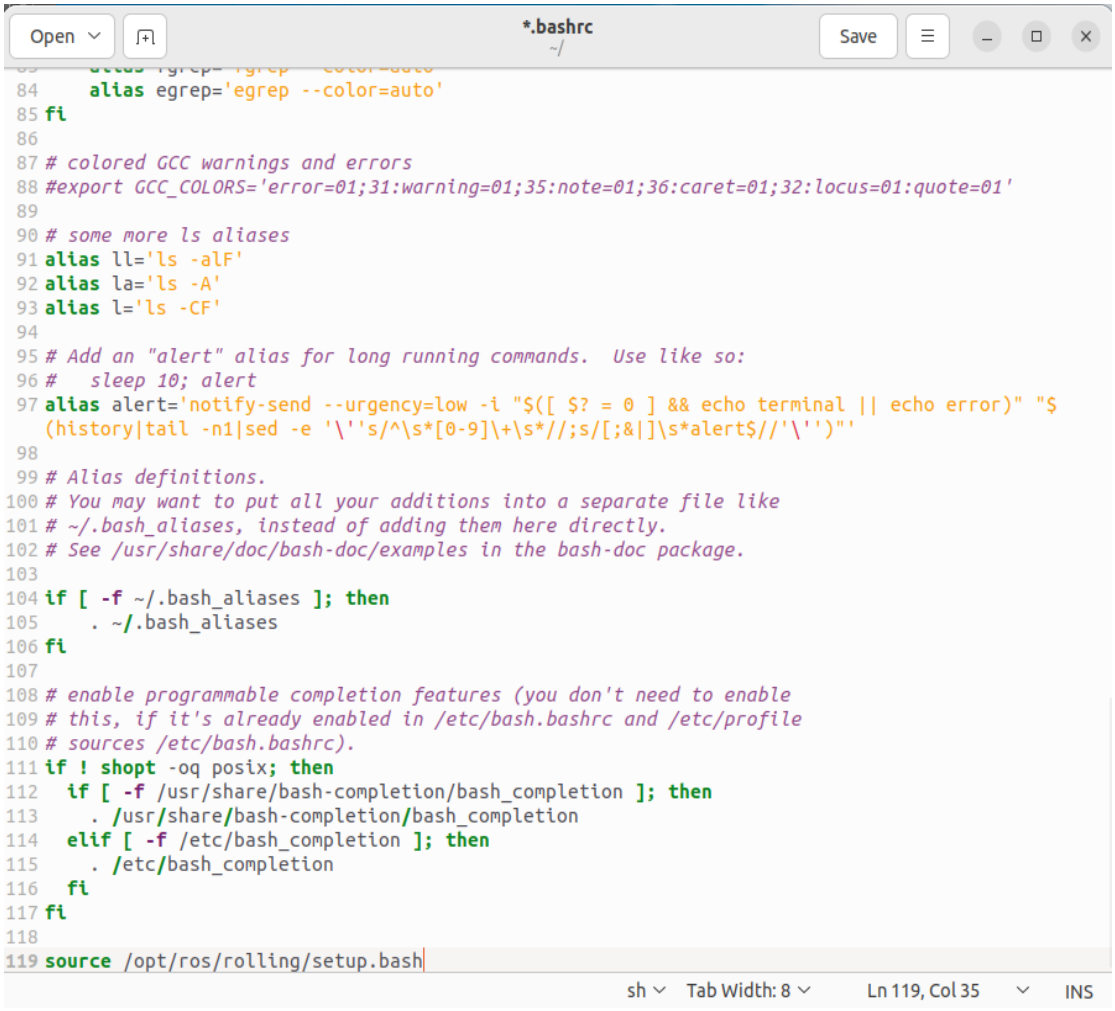
```
billy@billy:~$ gedit ~/ .bashrc
```

Setup environment

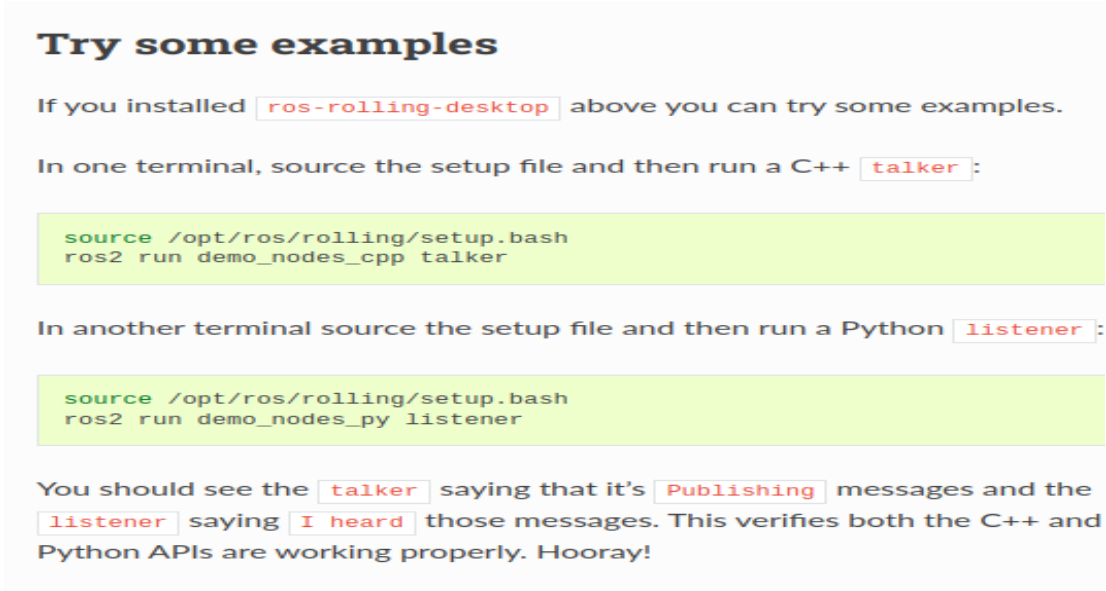
Set up your environment by sourcing the following file.

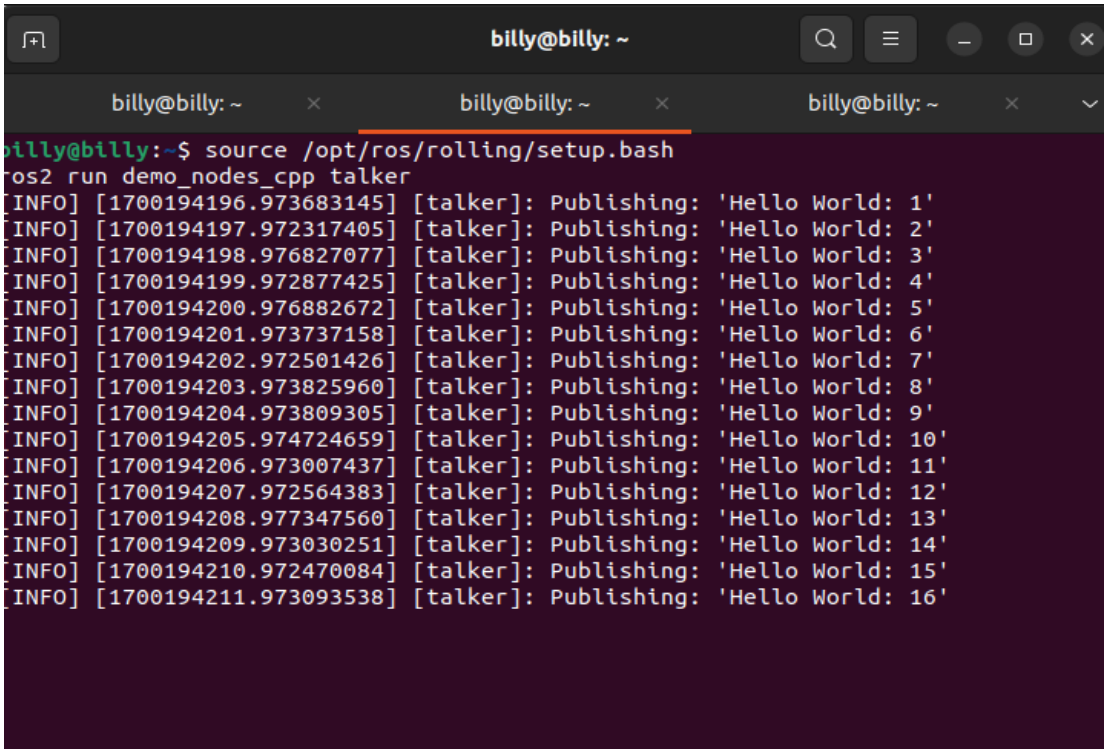
```
# Replace ".bash" with your shell if you're not using bash
# Possible values are: setup.bash, setup.sh, setup.zsh
source /opt/ros/rolling/setup.bash
```

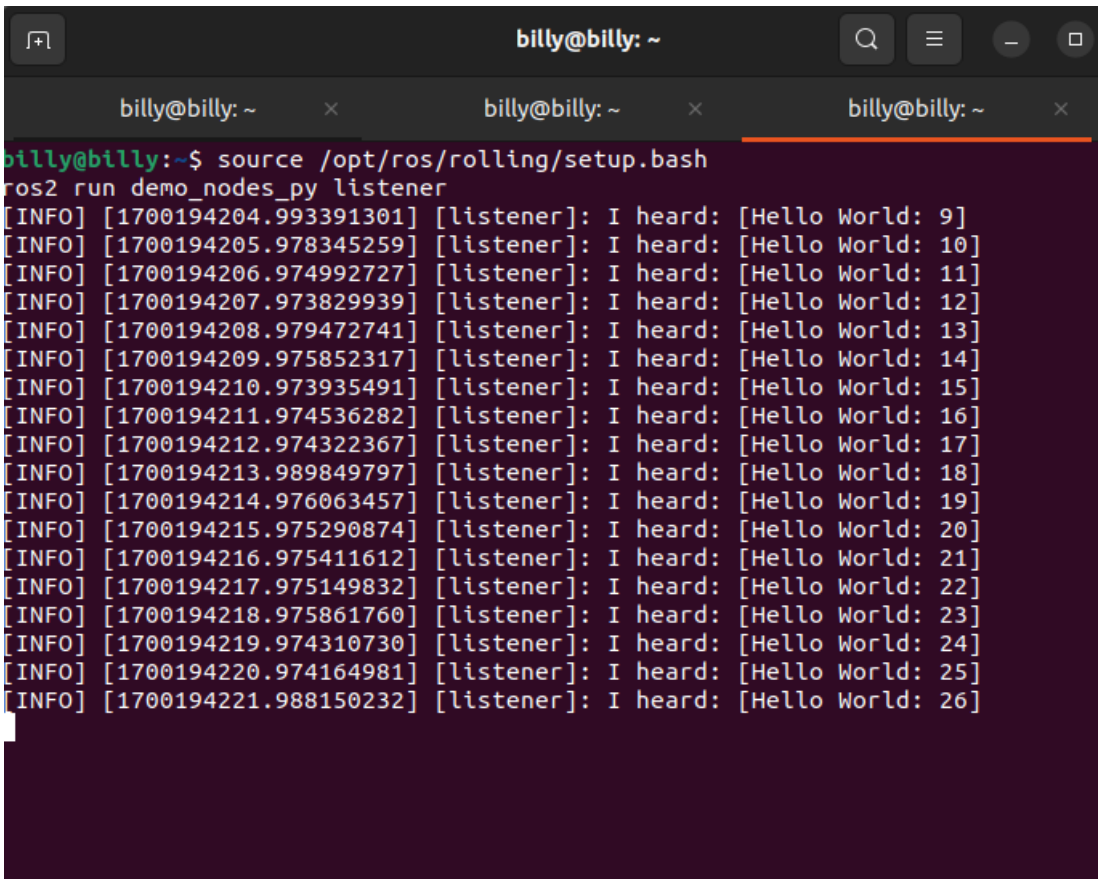
2.11 Scroll ke paling bawah dan masukkan source /opt/ros/rolling/setup.bash



2.12 Lakukan contoh untuk memastikan apakah ros rolling berjalan. Dengan menjalankan c++ talker dan listener.







Jika antara talker dan listener sudah terhubung, artinya ros2 rolling sudah berjalan dengan benar. Selamat!