Installation of Px4 SITL with ros and gazebo

Go to px4 firmware Github repo and git clone it. Firmware will get cloned to file named Firmware at home.
https://github.com/PX4/Firmware

Now go to this site and navigate to **Gazebo with ROS Melodic ,**download and run ubuntu_sim_ros_melodic.sh script. source ubuntu_sim_ros_melodic.sh will execute it.

Add these paths in .zshrc
GAZEBO_PLUGIN_PATH=$GAZEBO_PLUGIN_PATH:$HOME/Firmware/build/px4_sitl_default/build_gazebo
export GAZEBO_MODEL_PATH=$GAZEBO_MODEL_PATH:$HOME/Firmware/Tools/sitl_gazebo/models
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$HOME/Firmware/build/px4_sitl_default/build_gazebo
export ROS_PACKAGE_PATH=$ROS_PACKAGE_PATH:$HOME/Firmware
export ROS_PACKAGE_PATH=$ROS_PACKAGE_PATH:$HOME/Firmware/Tools/sitl_gazebo

Then in terminal type source ~/.zshrc

Now go to the Firmware folder and execute the commands in https://dev.px4.io/v1.9.0/en/simulation/gazebo.html to get the vehicle.

Use this roslaunch statement to launch mavros
roslaunch mavros px4.launch fcu_url:="udp://:14540@192.168.1.36:14557"

Now the simulation is ready and can be controlled with ros nodes.
Now we need to integrate with ros so that we can get and publish sensor datas from ros.
To install plugins:
sudo apt install ros-melodic-gazebo-ros ros-melodic-gazebo-plugins
Then to launch ros with px4 sitl gazebo,
cd Firmware

```
DONT_RUN=1 make px4_sitl_default gazebo
source ~/catkin_ws/devel/setup.zsh
source Tools/setup_gazebo.bash $(pwd) $(pwd)/build/px4_sitl_default
export ROS_PACKAGE_PATH=$ROS_PACKAGE_PATH:$(pwd)
export ROS_PACKAGE_PATH=$ROS_PACKAGE_PATH:$(pwd)/Tools/sitl_gazebo
roslaunch px4 posix_sitl.launch
```

Now type, rostopic list to see the additional ros topics. From there we can take outputs of sensors.