# Session 4

## Subscriber and Publisher Programs

http://wiki.ros.org/ROS/Tutorials
Do Tutorial 7, 9 and 10. Don't want to take them as serious as the other tutorials.But these functionalities will prove quite beneficial for you in the future.
Tutorial 8 is important , rqt_graph will give a pictorial view of our connection. So if one topics/node is not connected to the desired one, we can easily find it with rqt_graph.
I always recommend running it whenever you are running a program for the first time.
Roslaunch is also important as you came across while running mavros. Mavros is a collection of ros nodes. So inorder to launch multiple nodes at once we use roslaunch.

Now we know how the ROS framework works, Next tutorials are its application. Very important tutorials.
Read and understand talker and listener programs ,each and every part of it. Run it as per the instructions and see the output. Play around with it. Those programs the data variable was of type string.

11 and 13 tutorials are important for this course. 12 and 13 for python users.( But first i prefer to follow c++, then python so if you are good with that language  you will get to know various advantages over c++).

**Task1**: Make a single code for both publisher and listener.

Service and client read them.

With this we came to the end of our tutorial lessons required.
Now from tutorial 5 and 6, you have the names of publisher and subscriber topics of Turtlesim. Check their data types and try sending some messages to control turtle.

**Task2**: Draw a square with the turtle. Now make a circle after that.Then combine and depending on user input either square or circle.

Now you can write code for controlling turtlesim. Now what if you are provided with topics and datatypes of a quadcopter model. Mavros provides these topics and data those are published are converted to Mavlink messages to communicate and control Quadcopter.