

# ROS2 Study Guide

## Week 1

- Learn the basic of ROS2, this includes publishers, subscribers, services and clients.
- Understand the syntax used to write code for the above mentioned in C++
- Create and use custom messages and services.
- Understand the concept of Packages and workspaces.
- Familiarize with Git for source control.

### Week1-Task 1

Create two nodes. Node 1 is to publish a number to a topic /num. Node two takes this data and multiplies it by 2 and publishes the value to the topic /response. Every time a message appears on /response, node 1 is to increment the number it first published and publish it back to node 2.

### Week1-Task 2

Write a node which subscribes to a joystick message (sensor\_msgs/joy) topic "/joy" and converts the data from the joystick to velocity commands. The velocity commands are to be used to control a robot which is constrained to move on a 2D plane and uses a differential drive.

### Week1-Task 3

Write a node which creates a service with a custom service message which contains a request of type int and a response of type string. Write two nodes.

**Node1** acts as the service and provides responses according to the request number, the following response is to be given for each request

1. Random Number between 0 - 100
2. Current Time
3. A fixed string

4. Latest value from the topic "/chatter"

Any other number has to return an "unknown request"

**Node 2** calls the service from number 0-5 with a 1 second delay between each call. It also has to print the response data to the terminal.

### **Week1-Task Challenge**

Write 3 nodes.

**Node A:** Has a service which adds two numbers

**Node B :** Has a service which calls the service of node A and multiplies the result of the request by 2.

**Node C :** Calls service B with a random number, synchronously and prints the response to console.

NOTE: All service calls are to be synchronous.