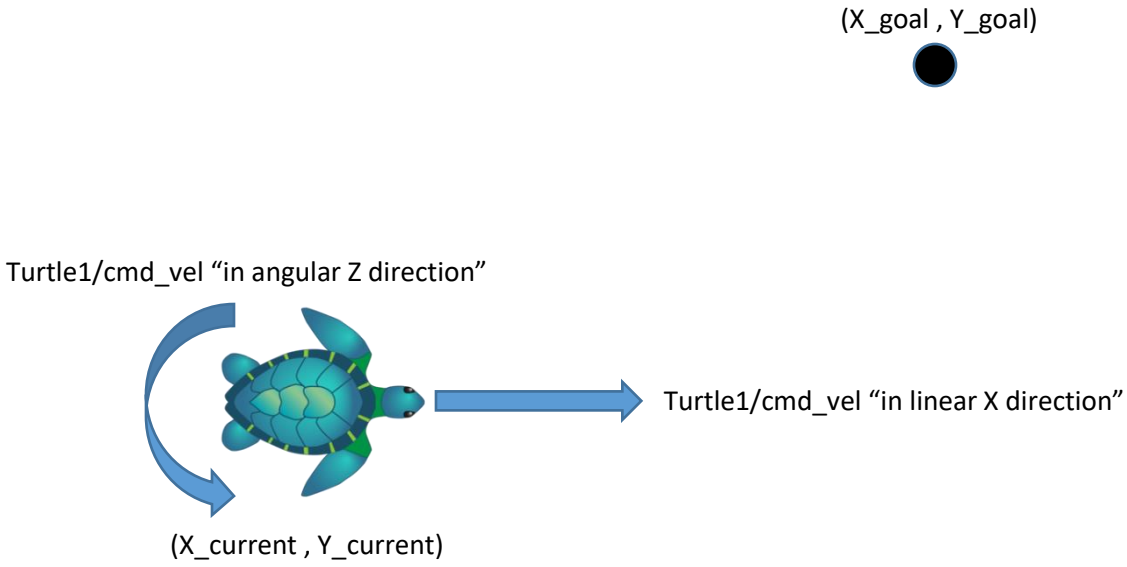
# ROS Project

## Go to controller

# Description:

The project is required to make a Go-To-Controller integrated with turtlesim simulation as we discussed in the session. By giving x-goal and y-goal as input in .yaml file then the turtle will move to the required goal.

# Mathematics of algorithm:




$$X_{linear_{velocity}} = \beta\ (\sqrt{\Delta X^2 + \Delta Y^2})$$

$$Z_{angular_{velocity}} = \emptyset(-\theta_{current} + \tan^{-1}\frac{\Delta Y}{\Delta X})$$

$$\Delta X = (Xgoal - Xcurrent)$$

$$\Delta Y = (Ygoal - Ycurrent)$$

$$\beta : is\ a\ constant\ you\ tune\ it\ to\ make\ linear\ velocity\ faster\ or\ slower$$

$$\emptyset : is\ a\ constant\ you\ tune\ it\ to\ make\ rotation\ faster\ or\ slower$$

# Requirement:

The required that must exist in the project :

1. Create a publisher that take goal coordinate from param then make the above calculation and publish the linear and angular velocities for turtlesim and within the same node it will subscribe to position sensor to be able to update its velocity when approaching to the goal.
   "Note it can't take a point until the publisher print arrived to the goal".

2. Create a yaml file that contain $\beta$ and $\phi$ "default both = 0 " which given to the required publisher by the user

3. Create launch file that launch file parameter first then publisher and subscriber node