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Simulation and modelling

LAB 3

Exercise:

Perform the TurtleSim simulation in ROS and make the circular movement and square movement of the turtle.

Screenshots, Source code and method of execution. Submit either a PDF or Doc or Docx format.

Code for circular motion:

```
#!/usr/bin/env python3
# license removed for brevity
import rospy
from geometry_msgs.msg import Twist

def circular_movement_node():
    pub = rospy.Publisher('/turtle1/cmd_vel', Twist, queue_size=10)
    rospy.init_node('tbsim_driver', anonymous=True)
    rate = rospy.Rate(1)
    while not rospy.is_shutdown():

        robot_velocity = Twist()
        robot_velocity.linear.x = 2.0
        robot_velocity.angular.z = 0.9
        pub.publish(robot_velocity)
        rate.sleep()

if __name__ == '__main__':
    try:
        circular_movement_node()
    except rospy.ROSInterruptException:
        pass
```

Method of Execution:

1.Run \$ **roscore** command in terminal.

2. Now, open another terminal and run

\$ rosrun turtlesim turtlesim_node

3. In another terminal , go to your workspace

\$ cd 20BRS1168_ws/

\$ source ./devel/setup.bash

\$ rosrun ros_tutorial1 circular_movement.py

\$ rosrun ros_tutorial1 draw_square

Output:

```
[ WARN] [1674206169.671789467]: Oh no! I hit the wall! (Clamping from [x=4.984663, y=11.088964])
[ WARN] [1674206169.687391513]: Oh no! I hit the wall! (Clamping from [x=5.000663, y=11.088913])
^C
lab21@205A-scope--13:~/20BRS1168_ws$ rosrun turtlesim turtlesim_node
[ INFO] [1674207114.452263190]: Starting turtlesim with node name /turtlesim
[ INFO] [1674207114.455015306]: Spawning turtle [turtle1] at x=[5.544445], y=[5.544445], theta=[0.000000]
[ INFO] [1674207270.099524807]: Resetting turtlesim.
[ INFO] [1674207270.124680772]: Spawning turtle [turtle1] at x=[5.544445], y=[5.544445], theta=[0.000000]
```

```
^C
lab21@205A-scope--13:~/20BRS1168_ws$ rosrun ros_tutorial1 circular_movement.py
^C
lab21@205A-scope--13:~/20BRS1168_ws$ rosrun ros_tutorial1 circular_movement.py
^C
lab21@205A-scope--13:~/20BRS1168_ws$ rosrun ros_tutorial1 circular_movement.py
^Z
[1]+  Stopped                  rosrun ros_tutorial1 circular_movement.py
lab21@205A-scope--13:~/20BRS1168_ws$ rosrun turtlesim draw_square
[ INFO] [1674207270.351186209]: New goal [7.544445 5.544445, 0.000000]
[ INFO] [1674207272.270964960]: Reached goal
[ INFO] [1674207272.271084959]: New goal [7.448444 5.544445, 1.570796]
[ INFO] [1674207276.207043147]: Reached goal
[ INFO] [1674207276.207165377]: New goal [7.466837 7.544360, 1.561600]
[ INFO] [1674207278.142040041]: Reached goal
```

