

19AIE213 Robotic Operating Systems & Robot Simulation

Assignment - 2

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Topics : Subscriber, Launch files

- 1) In the package assignment_1 create a new folder called launch
ans)

```
deepak@ydeepaknav07:~$ source ~/S4_AI/devel/setup.bash
deepak@ydeepaknav07:~$ cd S4_AI/src/assignment1/
deepak@ydeepaknav07:~/S4_AI/src/assignment1$ mkdir launch
deepak@ydeepaknav07:~/S4_AI/src/assignment1$ ls
CMakeLists.txt  launch  package.xml  src
deepak@ydeepaknav07:~/S4_AI/src/assignment1$ 
```

- 2) Create a launch file for the circular trajectory publisher you wrote in
assignment 1

ans)

#xml code
<launch>
 <node name="turtledemo" pkg="assignment1"
 type="move_circle.py" output="screen"/>
</launch>

#Source code

```
#!/usr/bin/env python
```

```
import rospy
import time
from geometry_msgs.msg import Twist
```

```
pubspeed = rospy.Publisher('/turtle1/cmd_vel', Twist, queue_size=10)
```

```
rospy.init_node('turtledemo', anonymous = True)

move = Twist()

i=0

while(i<7):
    rospy.loginfo('moving straight')
    move.linear.x=5
    rospy.loginfo('angular movement')
    move.angular.z=2
    pubspeed.publish(move)
    i+=1
    rospy.sleep(1)

rospy.loginfo('stop')
move.linear.x=0
move.linear.z=0
pubspeed.publish(move)
```

```

deepak@ydeepaknav07:~/S4_AI/src/assignment1/launch$ roslaunch circular.launch.xml
... logging to /home/deepak/.ros/log/2806f4c8-6de6-11eb-976e-bc7737e43b5d/roslaunch-ydeepaknav07-4293.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ydeepaknav07:45377/

SUMMARY
=====
PARAMETERS
  * /rostdistro: kinetic
  * /rosversion: 1.12.17

NODES
/
  turtledemo (assignment1/move_circle.py)

ROS_MASTER_URI=http://localhost:11311

process[turtledemo-1]: started with pid [4310]
[INFO] [1613213017.929605]: moving straight
[INFO] [1613213017.929975]: angular movement
[INFO] [1613213018.931534]: moving straight
[INFO] [1613213018.932832]: angular movement
[INFO] [1613213019.935535]: moving straight
[INFO] [1613213019.936390]: angular movement
[INFO] [1613213020.938456]: moving straight
[INFO] [1613213020.939249]: angular movement
[INFO] [1613213021.940958]: moving straight
[INFO] [1613213021.941764]: angular movement
[INFO] [1613213022.943770]: moving straight
[INFO] [1613213022.944373]: angular movement
[INFO] [1613213023.946334]: moving straight
[INFO] [1613213023.946991]: angular movement
[INFO] [1613213024.948780]: stop
[turtledemo-1] process has finished cleanly
log file: /home/deepak/.ros/log/2806f4c8-6de6-11eb-976e-bc7737e43b5d/turtledemo-1*.log
all processes on machine have died, roslaunch will exit
shutting down processing monitor...

```



- 3) Create a launch file for the square trajectory publisher you wrote in assignment 1

ans)

#xml code

```
<launch>
  <node name="turtledemo" pkg="assignment1"
    type="move_square.py" output="screen"/>
</launch>

#Source code
#!/usr/bin/env python

import rospy
import time
from geometry_msgs.msg import Twist

PI = 3.1415926535897

pubspeed = rospy.Publisher('/turtle1/cmd_vel', Twist, queue_size=10)

rospy.init_node('turtledemo', anonymous = True)

move = Twist()

i=0
while(i<2):
    rospy.loginfo('moving straight')
    move.linear.x=4
    pubspeed.publish(move)
    i+=1
    rospy.sleep(1)
move.linear.x=0
j=0
while(j<2):
    rospy.loginfo('changing angle')
    move.angular.z=45*2*PI/360
    pubspeed.publish(move)
    j+=1
    rospy.sleep(1)
move.angular.z=0
k=0
```

```
while(k<2):
    rospy.loginfo('moving straight')
    move.linear.x=2
    pubspeed.publish(move)
    k+=1
    rospy.sleep(1)
move.linear.x=0
l=0
while(l<2):
    rospy.loginfo('changing angle')
    move.angular.z=45*2*PI/360
    pubspeed.publish(move)
    l+=1
    rospy.sleep(1)
move.angular.z=0
m=0
while(m<2):
    rospy.loginfo('moving straight')
    move.linear.x=2
    pubspeed.publish(move)
    m+=1
    rospy.sleep(1)
move.linear.x=0
n=0
while(n<2):
    rospy.loginfo('changing angle')
    move.angular.z=45*2*PI/360
    pubspeed.publish(move)
    n+=1
    rospy.sleep(1)
move.angular.z=0
o=0
while(o<2):
    rospy.loginfo('moving straight')
    move.linear.x=2
    pubspeed.publish(move)
    o+=1
```

```

rospy.sleep(1)
move.linear.x=0

rospy.loginfo('stop')
pubspeed.publish(move)

```

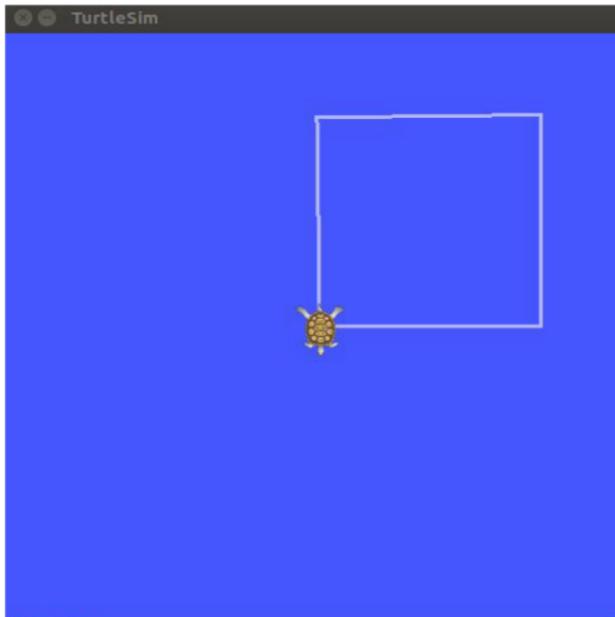
```

deepak@ydeepaknav07:~/S4_AI/src/assignment1/launch$ rosrun square_square.launch.xml
... logging to /home/deepak/.ros/log/2806f4c8-6de6-11eb-976e-bc7737e43b5d/roslaunch-ydeepaknav07-7484.log
Checking log directory for disk usage. This may take awhile.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://ydeepaknav07:34577/
SUMMARY
=====
PARAMETERS
  * /rosdistro: kinetic
  * /rosversion: 1.12.17
NODES
  /
    turtledemo (assignment1/move_square.py)
ROS_MASTER_URI=http://localhost:11311

process[turtledemo-1]: started with pid [7501]
[INFO] [1613215250.707151]: moving straight
[INFO] [1613215251.708955]: moving straight
[INFO] [1613215252.711744]: changing angle
[INFO] [1613215253.713874]: changing angle
[INFO] [1613215254.716298]: moving straight
[INFO] [1613215255.719080]: moving straight
[INFO] [1613215256.721316]: changing angle
[INFO] [1613215257.723946]: changing angle
[INFO] [1613215258.726642]: moving straight
[INFO] [1613215259.729488]: moving straight
[INFO] [1613215260.732070]: changing angle
[INFO] [1613215261.735201]: changing angle
[INFO] [1613215262.737856]: moving straight
[INFO] [1613215263.740432]: moving straight
[INFO] [1613215264.743274]: stop

```



- 4) In the source folder of your package assignment_1 create a subscriber python file subscribe_square.py, which outputs the continuous location coordinates (x,y) of turtle sim in move_square.py
ans)

#source code

```
#!/usr/bin/env python
```

```
import rospy  
from turtlesim.msg import Pose  
import time
```

```
def callback(msg):
```

```
print ('x location: ' + str(msg.x))  
print ('y location: ' + str(msg.y))
```

```
rospy.init_node('location_turtle', anonymous=True)
```

```
sub=rospy.Subscriber('turtle1/pose', Pose, callback)
```

`rospy.spin()`

- 5) Create a launch file to launch subscribe_square.py and move_square.py simultaneously

ans)

#xml code

```
<launch>
  <node name='turtledemo' pkg='assignment1' type='move_square.py' />
  <node name='location_turtle' pkg='assignment1'
type='subscribe_square.py' output='screen' />
</launch>
```