

ROS 프로그래밍 기초

1. roslaunch

여러 노드들을 한번에 실행 시키기 위한 파일 (기존 터미널 4개를 열고 진행하던 방식에서 터미널 1개로 진행 가능)

(1) roslaunch 사용법

`$roslaunch [패키지 이름] [실행시킬 launch 파일 이름]`

e.g. `$roslaunch my_pkg1 aaa.launch`

[실행시킬 launch 파일 이름] : 반드시 패키지에 포함된 launch 파일이어야 함

실행시킬 노드들의 정보가 XML 형식으로 기록되어 있음

(2) Node 태그

e.g. `<node pkg="my_pkg1" type="pub.py" name="pub_node"/>`

- launch 파일 작성

launch 파일에서는 roscore를 따로 실행할 필요가 없다.

`$gedit pub-sub.launch`

```
soorim@soorim-virtual-machine:~/xycar_ws/src/my_pkg1/launch$ gedit pub-sub.launch
[
  *pub-sub.launch (~/xycar_ws/src/my_pkg1/launch) - gedit
  열기(O) [icon] 저장(S)
  <launch>
    <node pkg="turtlesim" type="turtlesim_node" name="turtlesim_node"/>
    <node pkg="my_pkg1" type="pub.py" name="pub_node"/>
    <node pkg="my_pkg1" type="sub.py" name="sub_node" output="screen"/>
  </launch>|
]
```

- 실행하기

soorim@soorim-virtual-machine:~/xycar_ws/src/my_pkg1/launch\$ roslaunch my_pkg1 pub-sub.launch

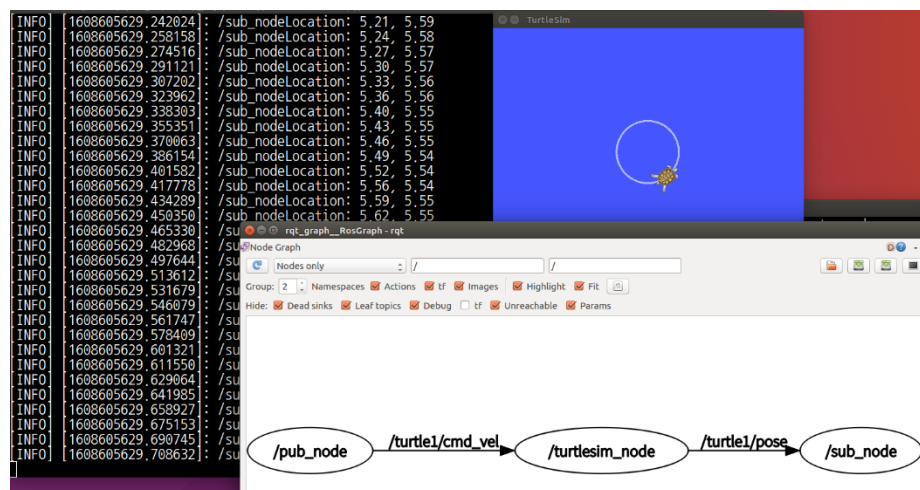
pub.py로 거북이가 돌고, sub.py로 해당 좌표 정보가 출력되어야 함

```
soorim@soorim-virtual-machine:~/xycar_ws/src/my_pkg1/launch$ roslaunch my_pkg1 pub-sub.launch
... logging to /home/soorim/.ros/log/30bc3a9a-43fe-11eb-a255-000c29068f06/roslaunch-soorim-virtual-machine-33796.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://localhost:43479/

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



2. launch에서 사용하는 Tag : param

Param : ROS 파라미터 서버에 변수를 등록하고 그 변수 값을 설정하기 위한 태그

속성 : name, type, value

e.g. <param name="age" type="int" value="11"/>

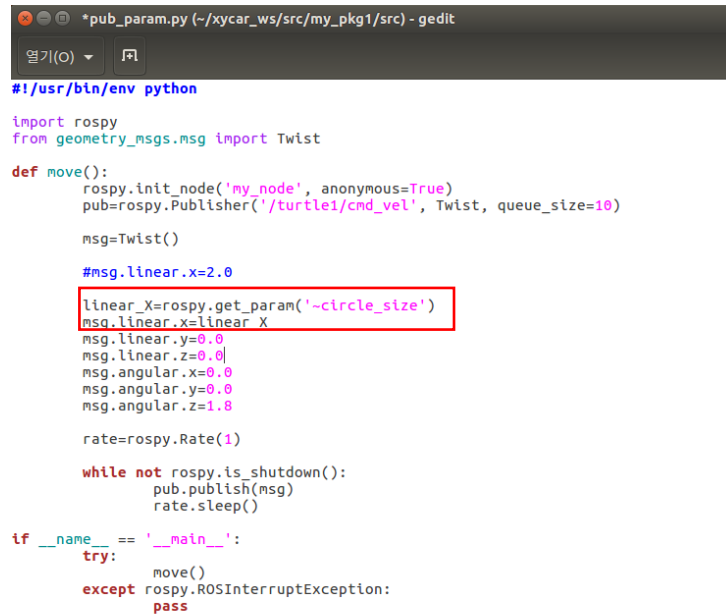
Private parameter 앞에 "~" 붙는다.(rospy.get_param('~age'))

- 실습

파라미터 값을 .launch파일에서 읽고 그에 맞게 동작하게 만들기

(1) Pub.py파일을 pub_param.py로 복사 및 수정

```
$cp pub.py pub_param.py
```



```
*pub_param.py (~/xycar_ws/src/my_pkg1/src) - gedit

#!/usr/bin/env python

import rospy
from geometry_msgs.msg import Twist

def move():
    rospy.init_node('my_node', anonymous=True)
    pub=rospy.Publisher('/turtle1/cmd_vel', Twist, queue_size=10)

    msg=Twist()

    #msg.linear.x=2.0
    linear_X=rospy.get_param('~circle_size')
    msg.linear.x=linear_X
    msg.linear.y=0.0
    msg.linear.z=0.0
    msg.angular.x=0.0
    msg.angular.y=0.0
    msg.angular.z=1.8

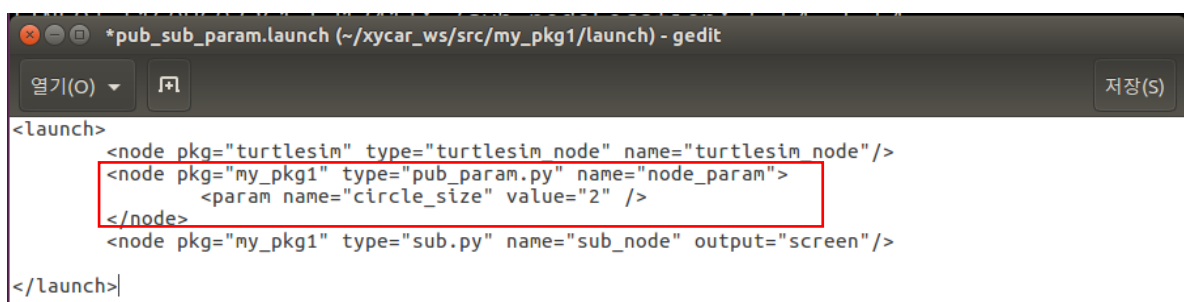
    rate=rospy.Rate(1)

    while not rospy.is_shutdown():
        pub.publish(msg)
        rate.sleep()

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

(2) launch에서 pub_sub.launch -> pub_sub_param.launch 로 복사 및 수정

```
$cp pub_sub.launch pub_sub_param.launch
```



```
*pub_sub_param.launch (~/xycar_ws/src/my_pkg1/launch) - gedit

<launch>
  <node pkg="turtlesim" type="turtlesim node" name="turtlesim node"/>
  <node pkg="my_pkg1" type="pub_param.py" name="node_param">
    <param name="circle_size" value="2" />
  </node>
  <node pkg="my_pkg1" type="sub.py" name="sub_node" output="screen"/>
</launch>
```


(3) 실행

```
soorim@soorim-virtual-machine:~/xycar_ws/src/my_pkg1/launch$  
pub_sub_param.launch
```

```
roslaunch
```

```
my_pkg1
```

INFO	1608607780.954831	:/sub_nodeLocation: 4.99, 5.69
INFO	1608607780.973813	:/sub_nodeLocation: 5.02, 5.67
INFO	1608607780.986447	:/sub_nodeLocation: 5.04, 5.66
INFO	1608607781.001819	:/sub_nodeLocation: 5.07, 5.64
INFO	1608607781.018385	:/sub_nodeLocation: 5.10, 5.63
INFO	1608607781.035780	:/sub_nodeLocation: 5.13, 5.62
INFO	1608607781.049831	:/sub_nodeLocation: 5.16, 5.61
INFO	1608607781.066629	:/sub_nodeLocation: 5.19, 5.60
INFO	1608607781.081698	:/sub_nodeLocation: 5.22, 5.59
INFO	1608607781.097653	:/sub_nodeLocation: 5.25, 5.58
INFO	1608607781.114674	:/sub_nodeLocation: 5.29, 5.57
INFO	1608607781.131348	:/sub_nodeLocation: 5.32, 5.56
INFO	1608607781.145473	:/sub_nodeLocation: 5.35, 5.56
INFO	1608607781.165827	:/sub_nodeLocation: 5.38, 5.55
INFO	1608607781.180237	:/sub_nodeLocation: 5.41, 5.55



value 값을 2-> 5로 바꾸기

INFO	1608607869.138184	:/sub_nodeLocation: 2.78, 7.78
INFO	1608607869.144430	:/sub_nodeLocation: 2.79, 7.70
INFO	1608607869.156074	:/sub_nodeLocation: 2.81, 7.62
INFO	1608607869.173068	:/sub_nodeLocation: 2.83, 7.54
INFO	1608607869.190608	:/sub_nodeLocation: 2.86, 7.47
INFO	1608607869.204822	:/sub_nodeLocation: 2.88, 7.39
INFO	1608607869.220755	:/sub_nodeLocation: 2.91, 7.32
INFO	1608607869.236623	:/sub_nodeLocation: 2.94, 7.24
INFO	1608607869.253191	:/sub_nodeLocation: 2.97, 7.17
INFO	1608607869.269478	:/sub_nodeLocation: 3.01, 7.10
INFO	1608607869.286581	:/sub_nodeLocation: 3.04, 7.03
INFO	1608607869.301308	:/sub_nodeLocation: 3.08, 6.95
INFO	1608607869.321515	:/sub_nodeLocation: 3.12, 6.89
INFO	1608607869.334193	:/sub_nodeLocation: 3.16, 6.82
INFO	1608607869.348448	:/sub_nodeLocation: 3.21, 6.75
INFO	1608607869.366629	:/sub_nodeLocation: 3.25, 6.69

