ASSIGNMENT-3

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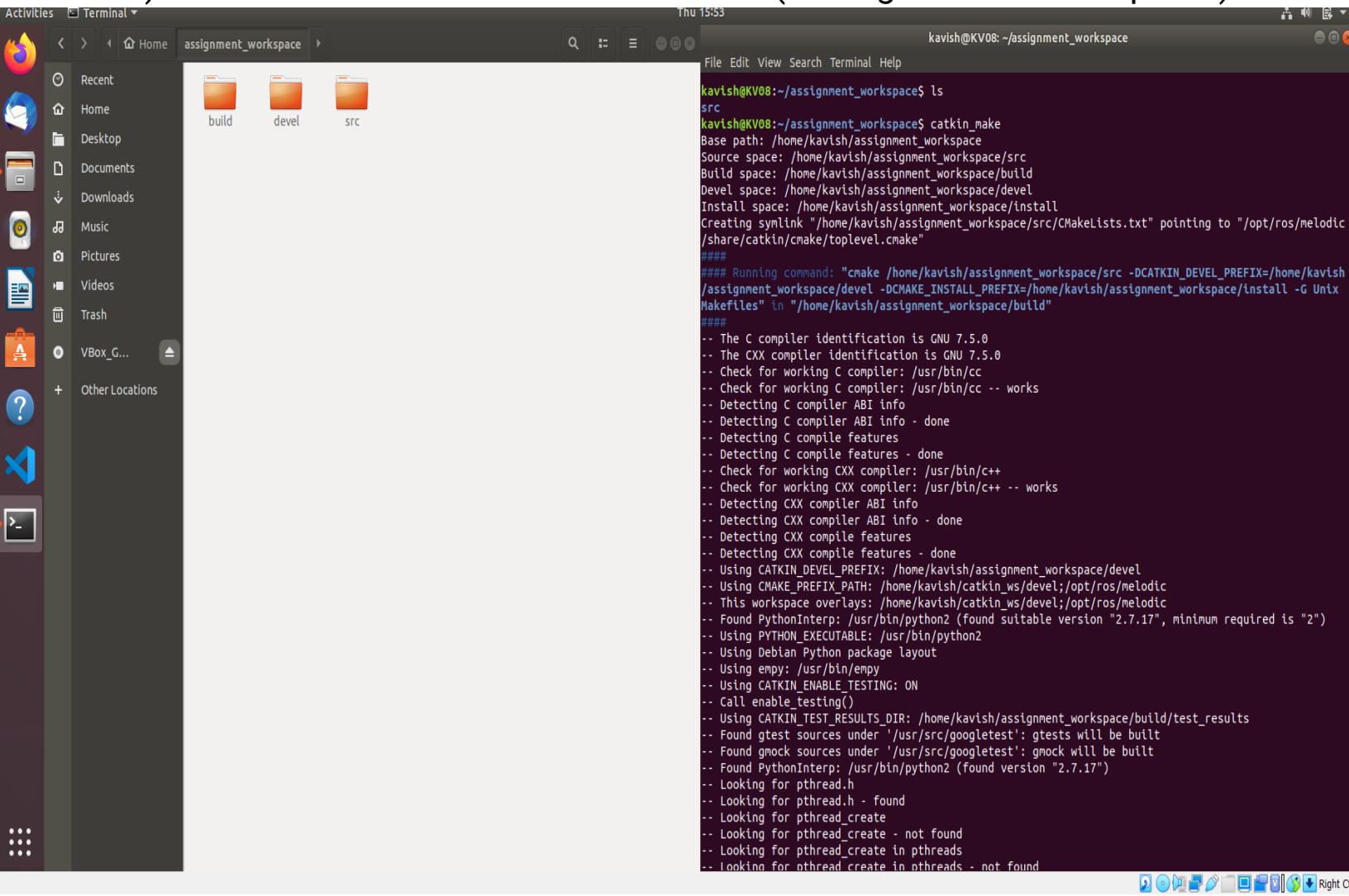
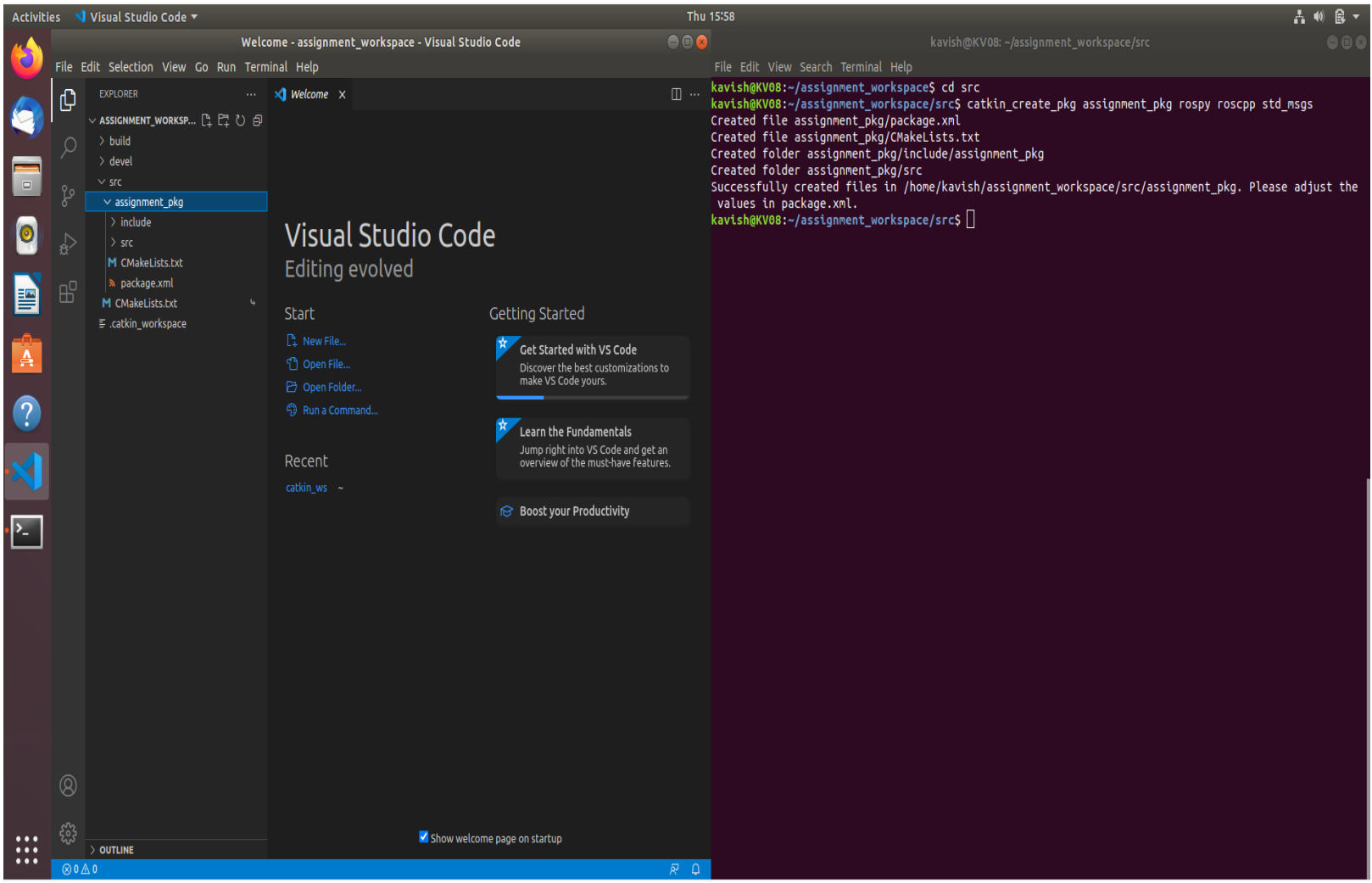
COLLEGE ID: 18BIS0130

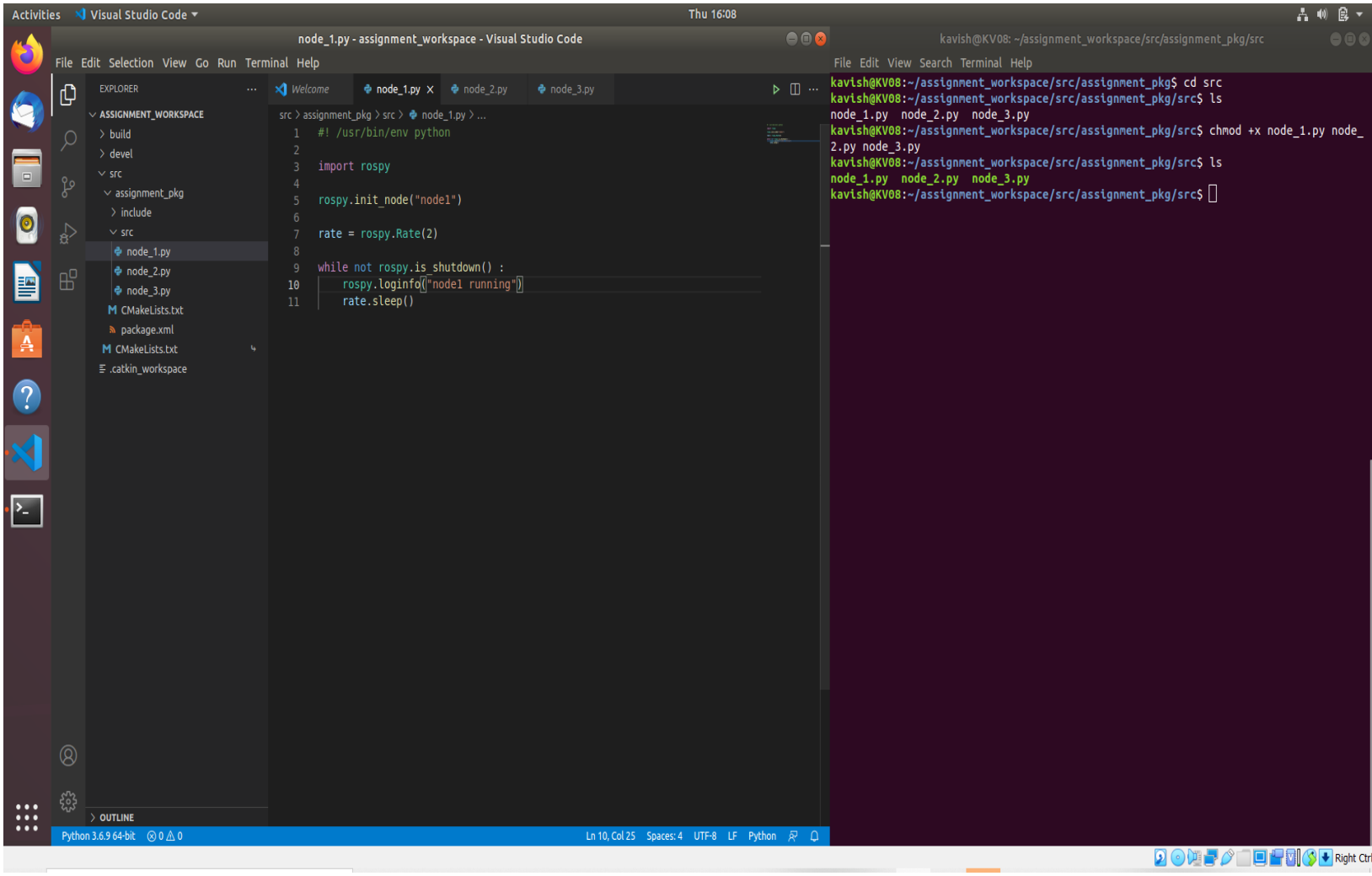
1) CREATE NEW CATKIN WORKSPACE(assignment_workspace):

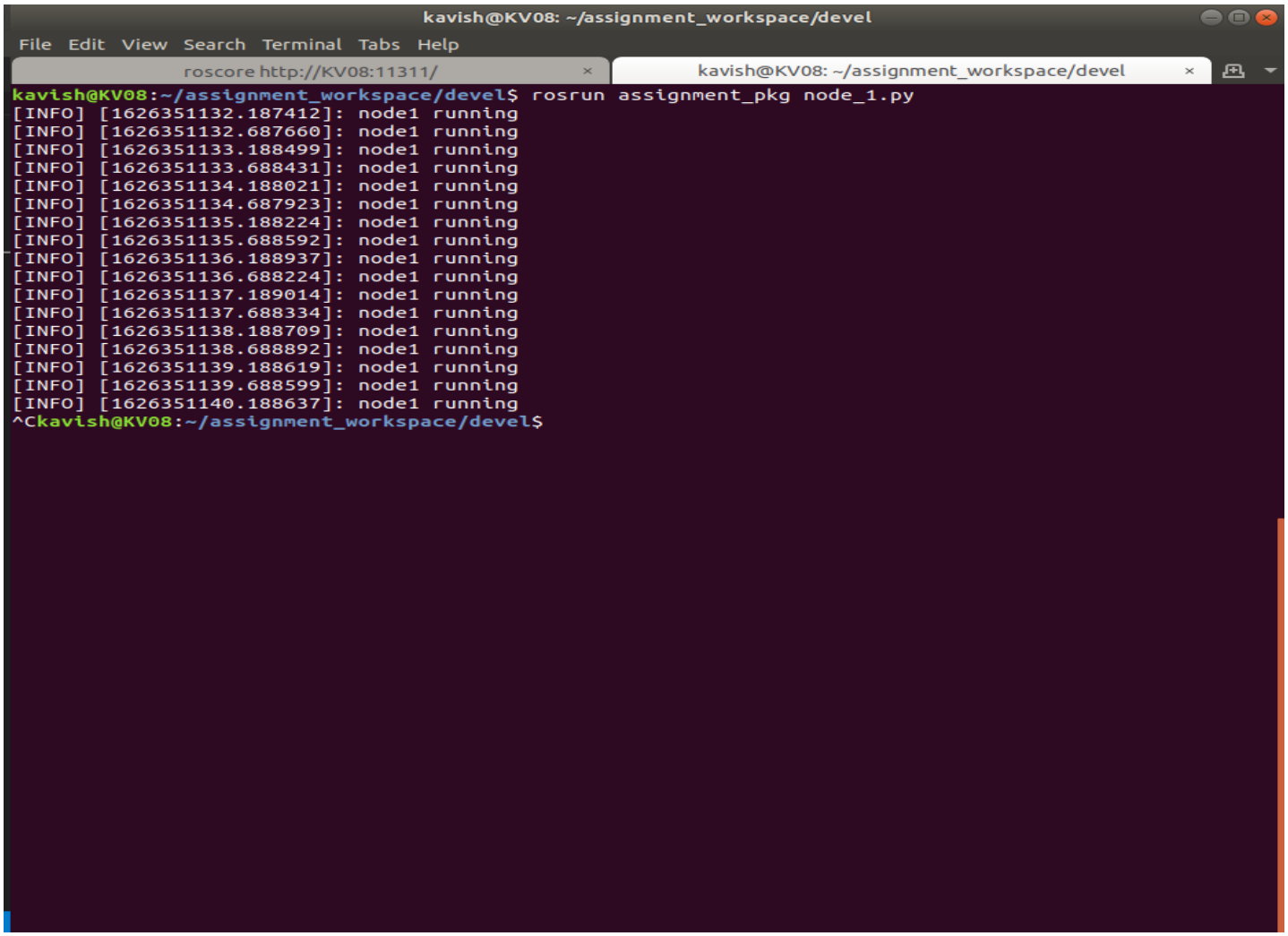


2) Create a new package(assignment_package) :

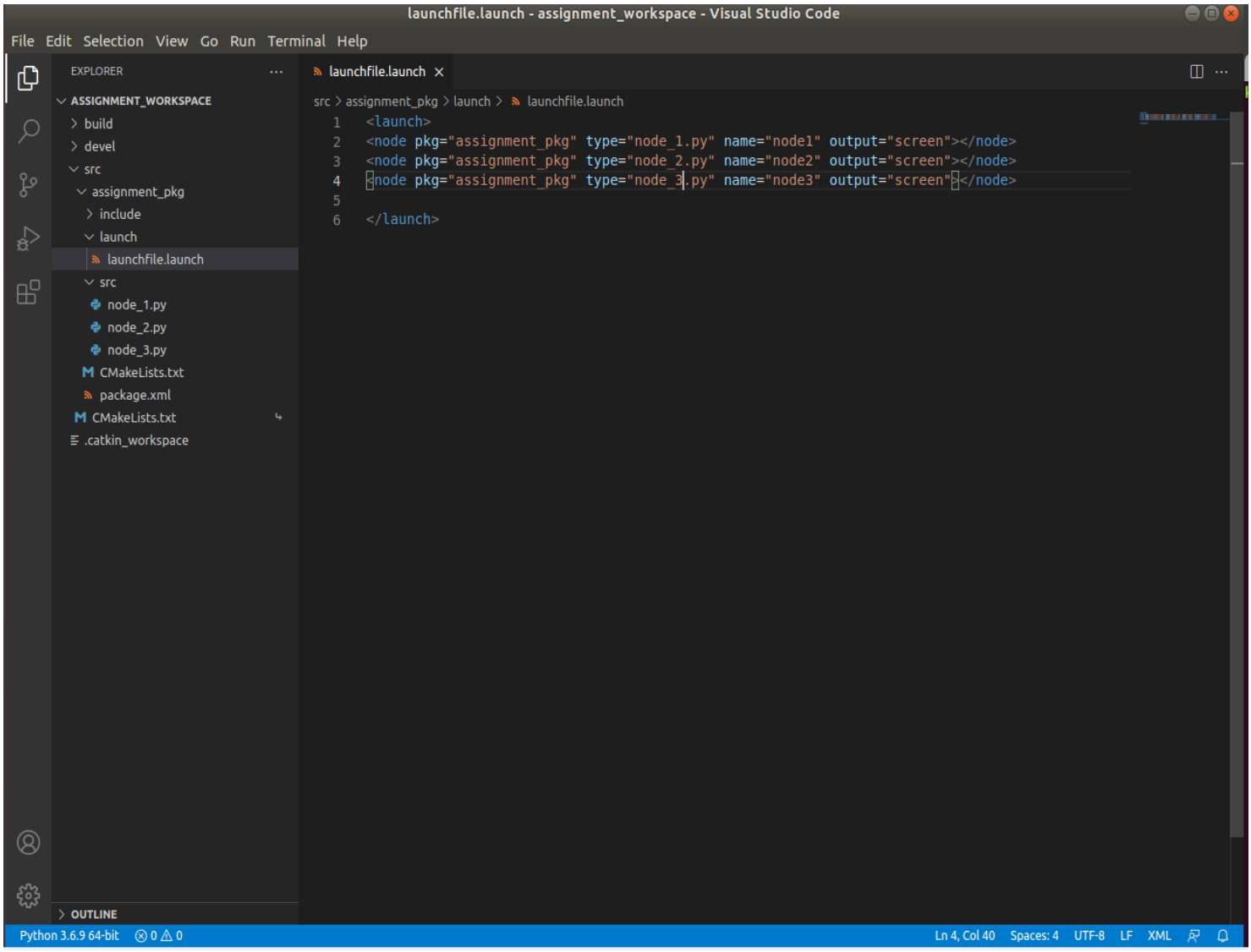


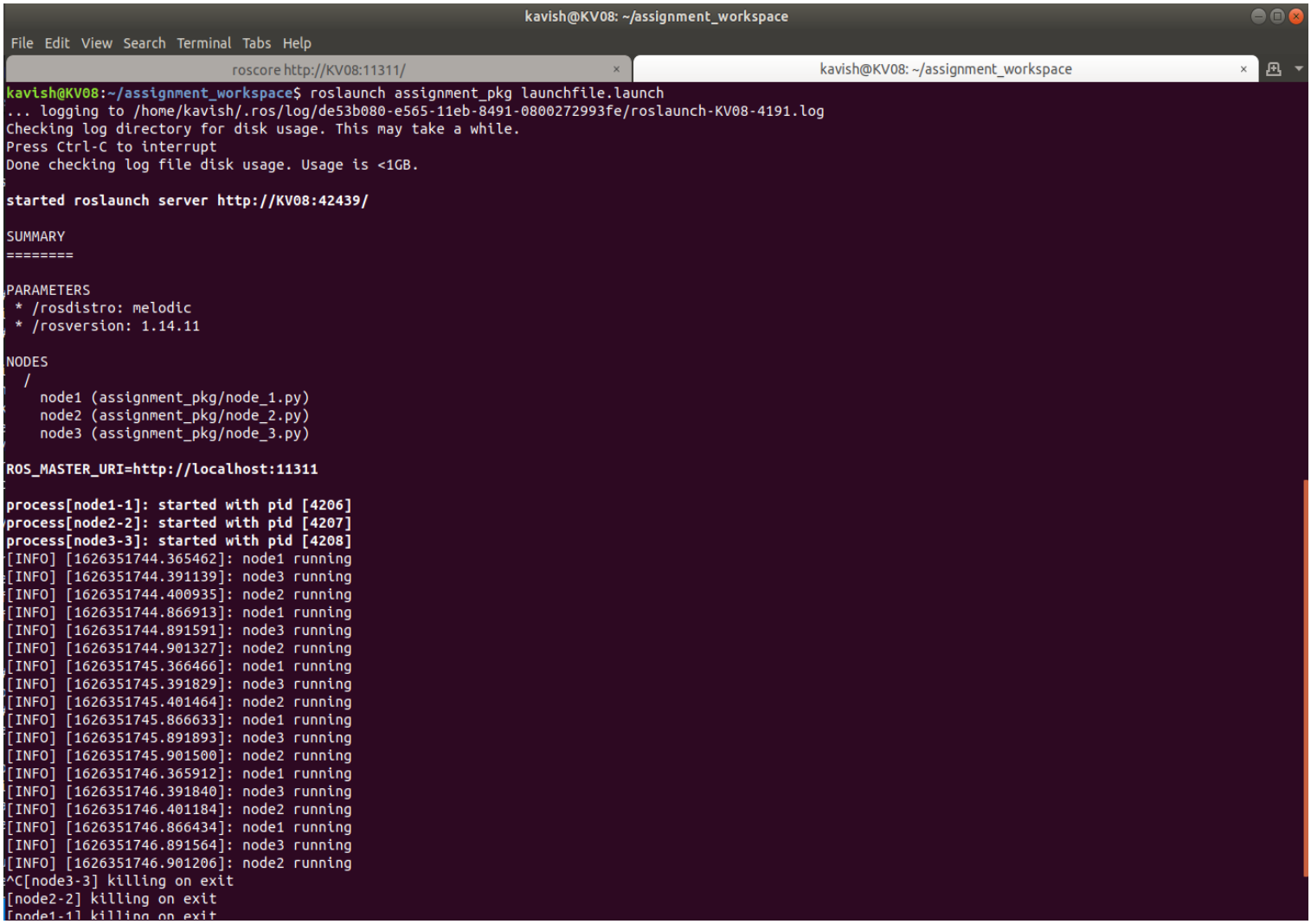
3) Creating three nodes that are active until and unless not manually closed



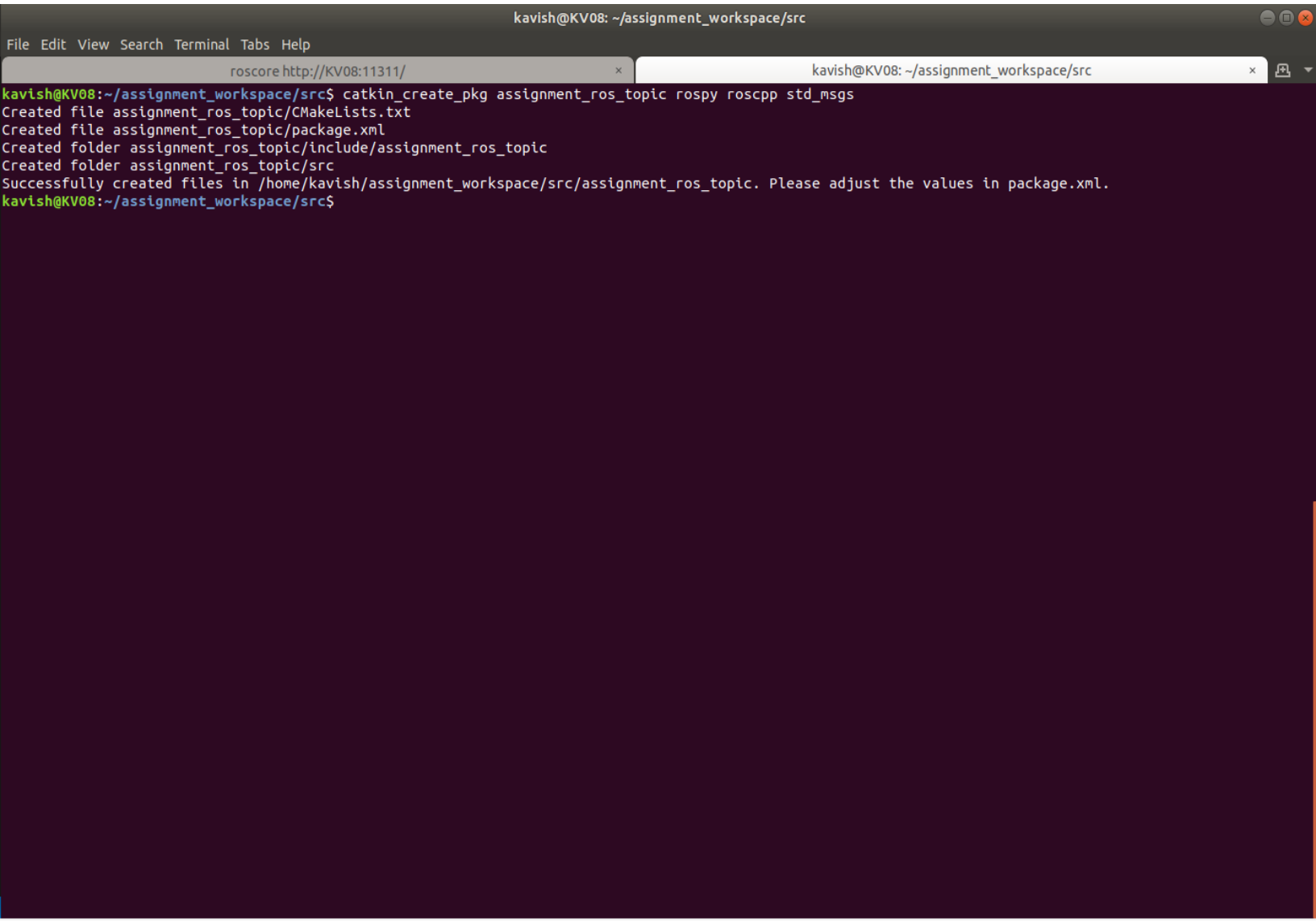

kavish@KV08: ~/assignment_workspace/devel
File Edit View Search Terminal Tabs Help
roscore http://KV08:11311/
kavish@KV08: ~/assignment_workspace/devel
kavish@KV08:~/assignment_workspace/devel$ rosrun assignment_pkg node_1.py
[INFO] [1626351132.187412]: node1 running
[INFO] [1626351132.687660]: node1 running
[INFO] [1626351133.188499]: node1 running
[INFO] [1626351133.688431]: node1 running
[INFO] [1626351134.188021]: node1 running
[INFO] [1626351134.687923]: node1 running
[INFO] [1626351135.188224]: node1 running
[INFO] [1626351135.688592]: node1 running
[INFO] [1626351136.188937]: node1 running
[INFO] [1626351136.688224]: node1 running
[INFO] [1626351137.189014]: node1 running
[INFO] [1626351137.688334]: node1 running
[INFO] [1626351138.188709]: node1 running
[INFO] [1626351138.688892]: node1 running
[INFO] [1626351139.188619]: node1 running
[INFO] [1626351139.688599]: node1 running
[INFO] [1626351140.188637]: node1 running
^Ckavish@KV08:~/assignment_workspace/devel$

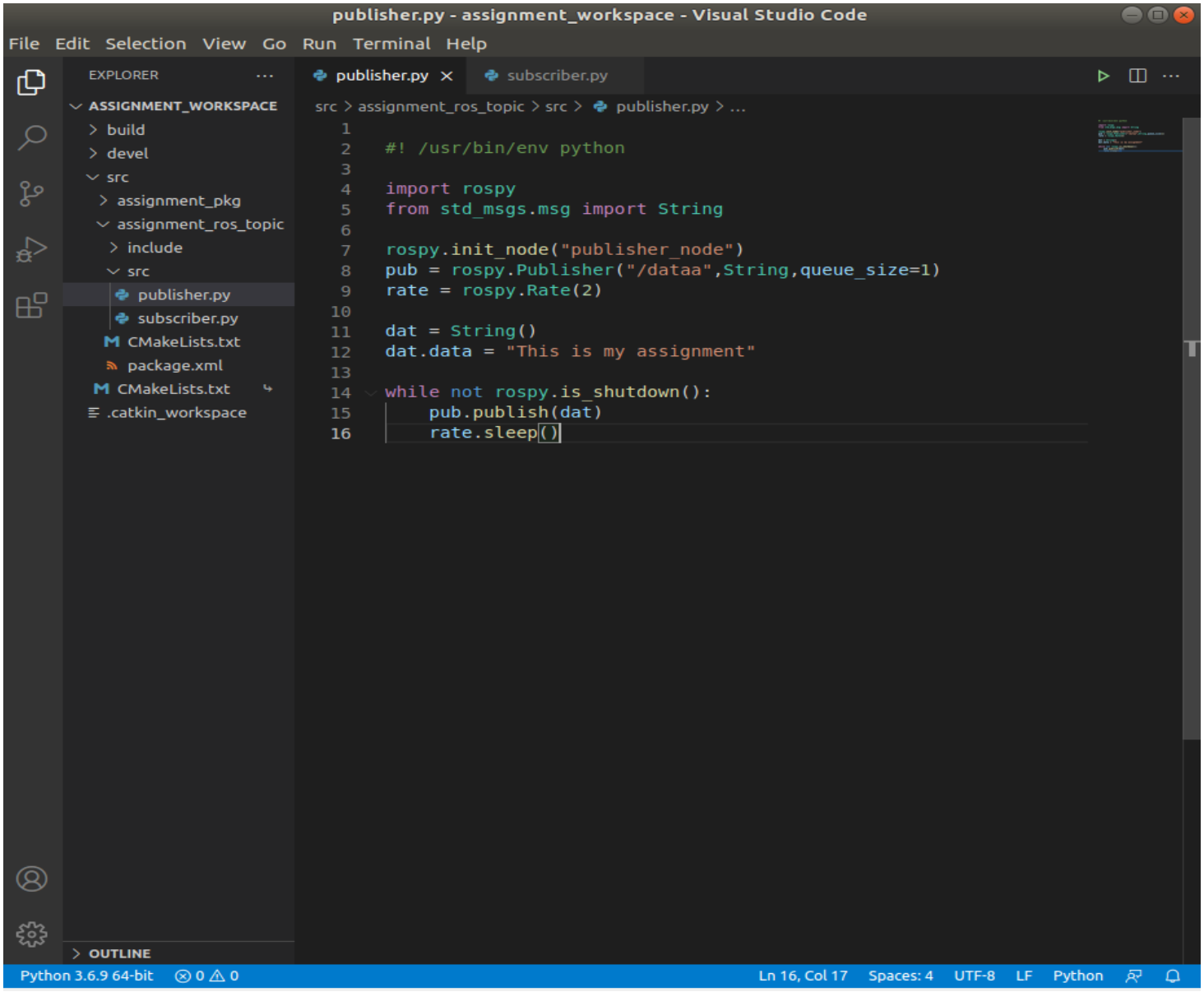
4) CREATING A LAUNCH FILE AND LAUNCHING ALL NODES AT ONCE:

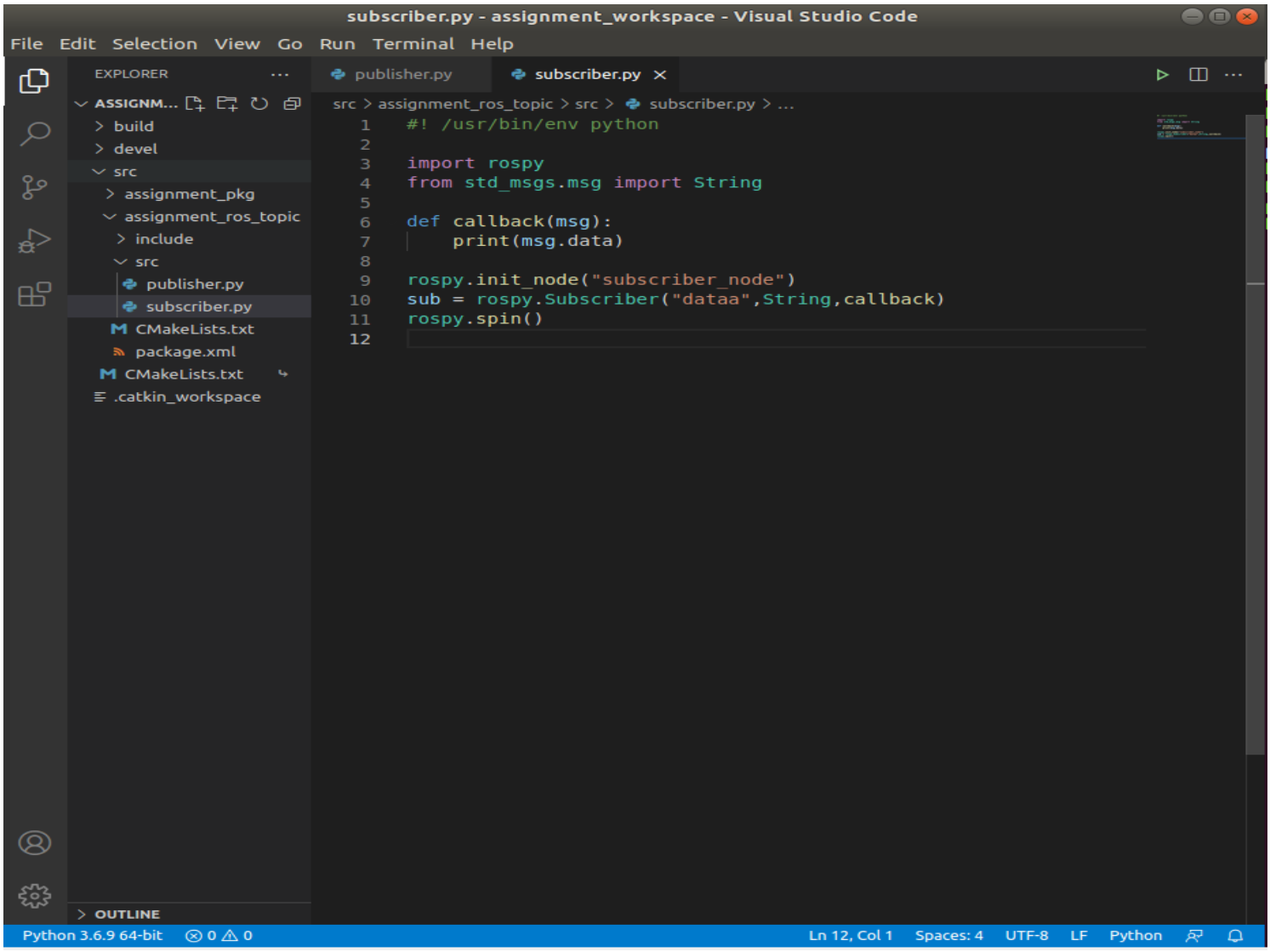



kavish@KV08: ~/assignment_workspace
File Edit View Search Terminal Tabs Help
roscore http://KV08:11311/
kavish@KV08: ~/assignment_workspace
kavish@KV08:~/assignment_workspace$ roslaunch assignment_pkg launchfile.launch
... logging to /home/kavish/.ros/log/de53b080-e565-11eb-8491-0800272993fe/roslaunch-KV08-4191.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.
started roslaunch server http://KV08:42439/
SUMMARY
========
PARAMETERS
* /rosdistro: melodic
* /rosversion: 1.14.11
NODES
/
node1 (assignment_pkg/node_1.py)
node2 (assignment_pkg/node_2.py)
node3 (assignment_pkg/node_3.py)
ROS_MASTER_URI=http://localhost:11311
process[node1-1]: started with pid [4206]
process[node2-2]: started with pid [4207]
process[node3-3]: started with pid [4208]
[INFO] [1626351744.365462]: node1 running
[INFO] [1626351744.391139]: node3 running
[INFO] [1626351744.400935]: node2 running
[INFO] [1626351744.866913]: node1 running
[INFO] [1626351744.891591]: node3 running
[INFO] [1626351744.901327]: node2 running
[INFO] [1626351745.366466]: node1 running
[INFO] [1626351745.391829]: node3 running
[INFO] [1626351745.401464]: node2 running
[INFO] [1626351745.866633]: node1 running
[INFO] [1626351745.891893]: node3 running
[INFO] [1626351745.901500]: node2 running
[INFO] [1626351746.365912]: node1 running
[INFO] [1626351746.391840]: node3 running
[INFO] [1626351746.401184]: node2 running
[INFO] [1626351746.866434]: node1 running
[INFO] [1626351746.891564]: node3 running
[INFO] [1626351746.901206]: node2 running
^C[node3-3] killing on exit
[node2-2] killing on exit
[node1-1] killing on exit

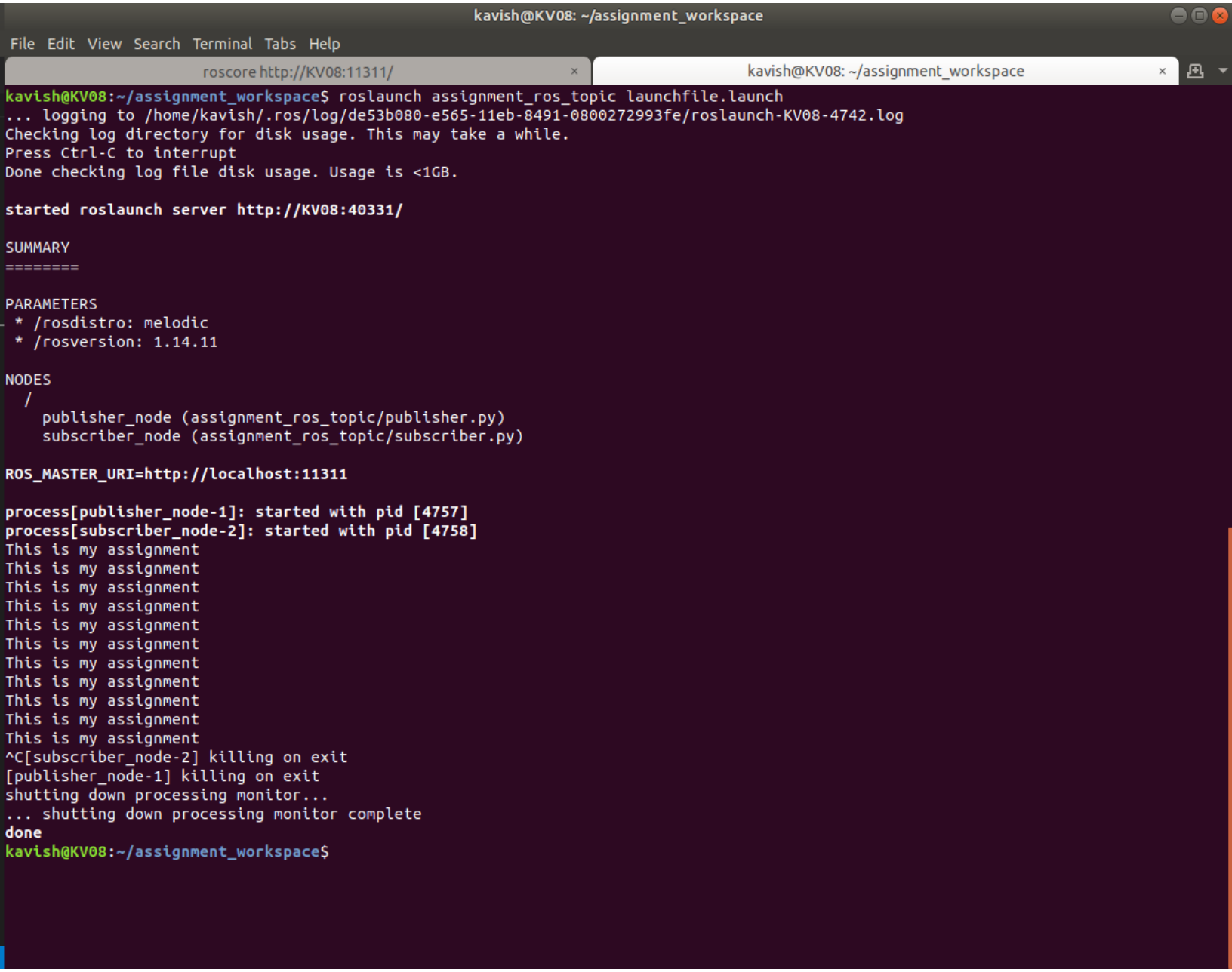
5) CREATING NEW ROS TOPIC, PUBLISHER NODE, SUBSCRIBER NODE AND SENDING STRING DATA




publisher.py - assignment_workspace - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ASSIGNMENT_WORKSPACE
build
devel
src
assignment_pkg
assignment_ros_topic
include
src
publisher.py
subscriber.py
CMakeLists.txt
package.xml
CMakeLists.txt
.catkin_workspace
OUTLINE
publisher.py
subscriber.py
src > assignment_ros_topic > src > publisher.py > ...
1
2 #! /usr/bin/env python
3
4 import rospy
5 from std_msgs.msg import String
6
7 rospy.init_node("publisher_node")
8 pub = rospy.Publisher("/dataa",String,queue_size=1)
9 rate = rospy.Rate(2)
10
11 dat = String()
12 dat.data = "This is my assignment"
13
14 while not rospy.is_shutdown():
15 pub.publish(dat)
16 rate.sleep()
Python 3.6.9 64-bit
0 0
Ln 16, Col 17
Spaces: 4
UTF-8
LF
Python


subscriber.py - assignment_workspace - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
ASSIGNM...
build
devel
src
assignment_pkg
assignment_ros_topic
include
src
publisher.py
subscriber.py
CMakeLists.txt
package.xml
CMakeLists.txt
.catkin_workspace
OUTLINE
publisher.py
subscriber.py
src > assignment_ros_topic > src > subscriber.py > ...
1 #! /usr/bin/env python
2
3 import rospy
4 from std_msgs.msg import String
5
6 def callback(msg):
7 print(msg.data)
8
9 rospy.init_node("subscriber_node")
10 sub = rospy.Subscriber("dataa",String,callback)
11 rospy.spin()
12
Python 3.6.9 64-bit
0 0
Ln 12, Col 1
Spaces: 4
UTF-8
LF
Python

6) Creating launch file and launching publisher and subscriber together



Q7) Identify two ROS-based robots :

1) Nao robot:-

NAO is an autonomous, programmable humanoid robot.
It has the following feature:

- 25 degrees of freedom which enable him to move and adapt to his environment
- 7 touch sensors located on the head, hands and feet, sonars and an inertial unit to perceive his environment and locate himself in space.
- 4 directional microphones and speakers to interact with humans.
- Speech recognition and dialogue available in 20 languages
- Two 2D cameras to recognize shapes, objects and even people.
- Open and fully programmable platform.

2) Elfin Robot:-

The Elfin Robot is a 6 axis collaborative robot.
Features:

- The Elfin Robot is built from 3 different D-modules with connecting parts in between.
- The power of the Elfin is the big reach with the combination of the different payloads, this creates a lot of different options.

- The D-modules are in one line with each other which makes it possible for the robot to stand vertically and makes the robot capable of working close to its own base.
- The robot is safe because of the internal measuring system that makes sure that every impact is noticed and where needed, can stop the robot.
- The package comes with a control box which supply adequate power to the robot and the touchscreen tablet to control the robot.