Robot Programming Lab
Ros services

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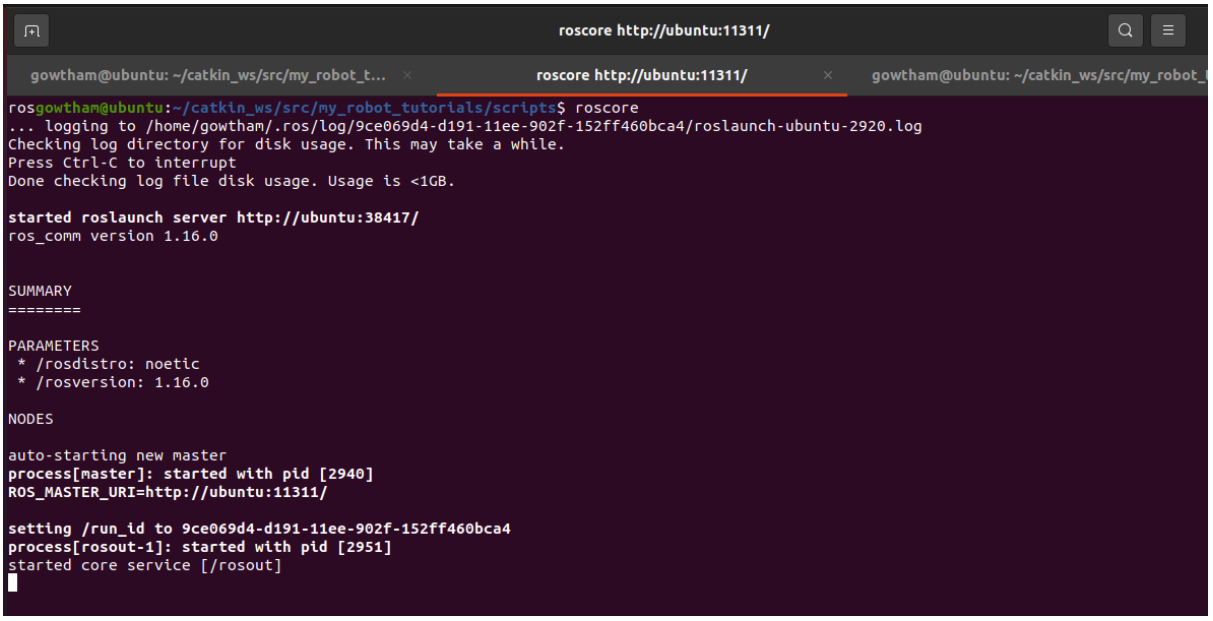
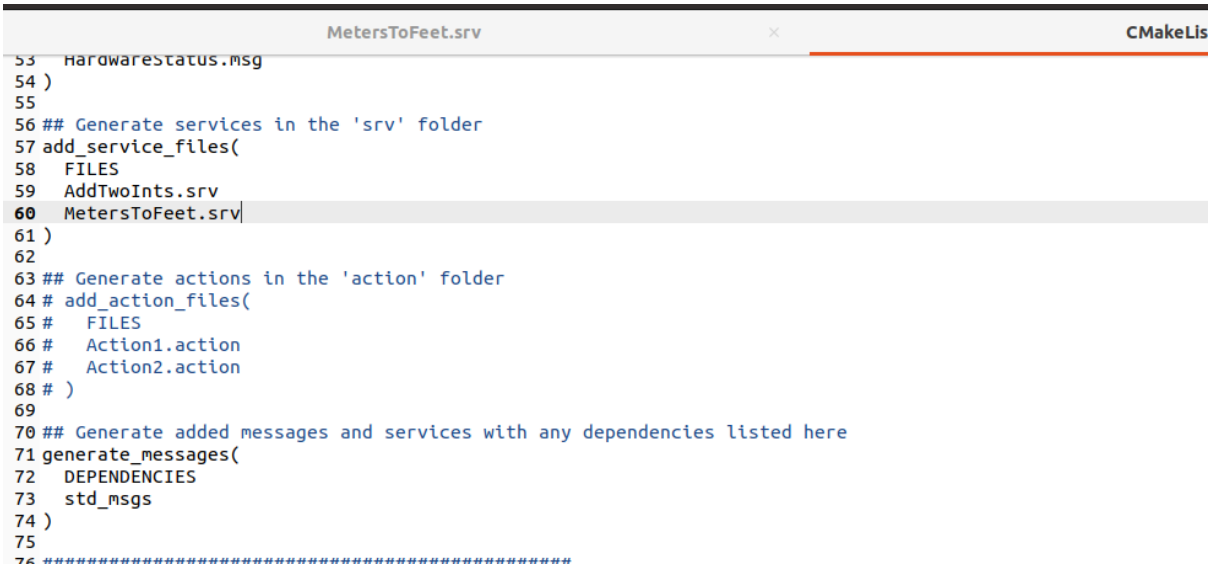
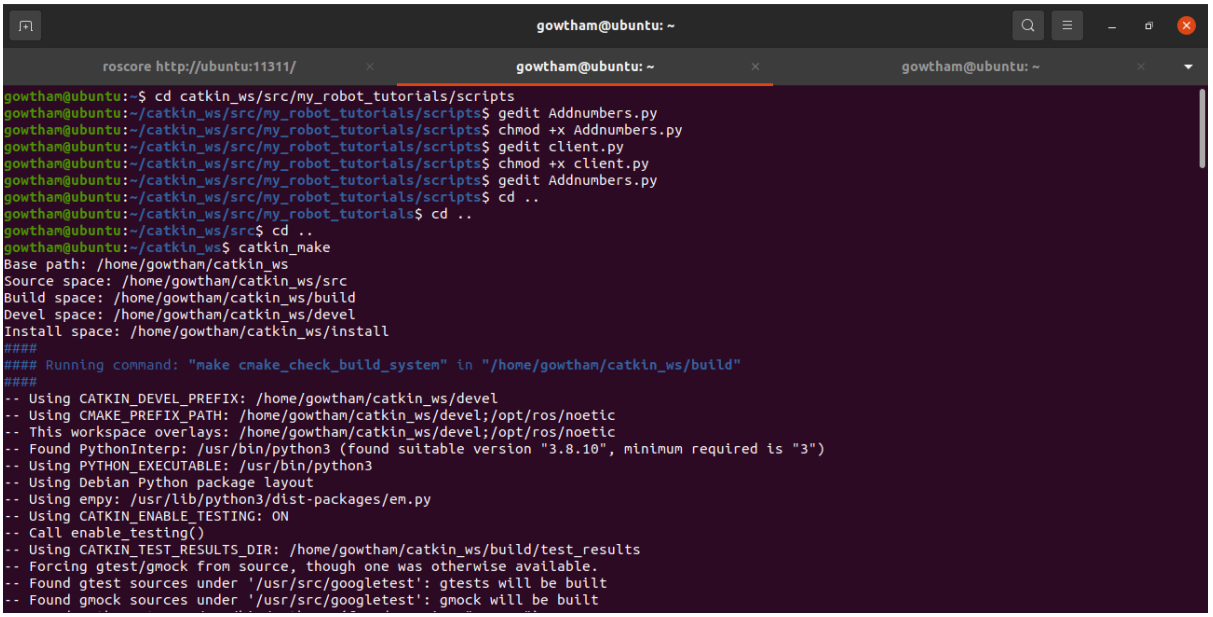
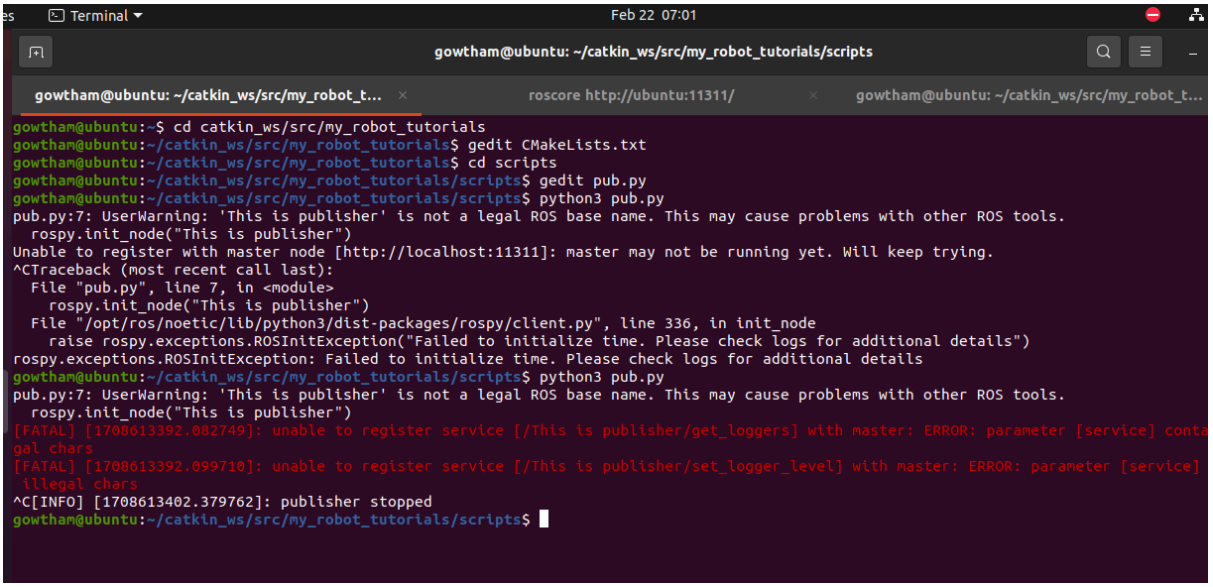
1. Creating a Server and Client for Addition of Two Integers.



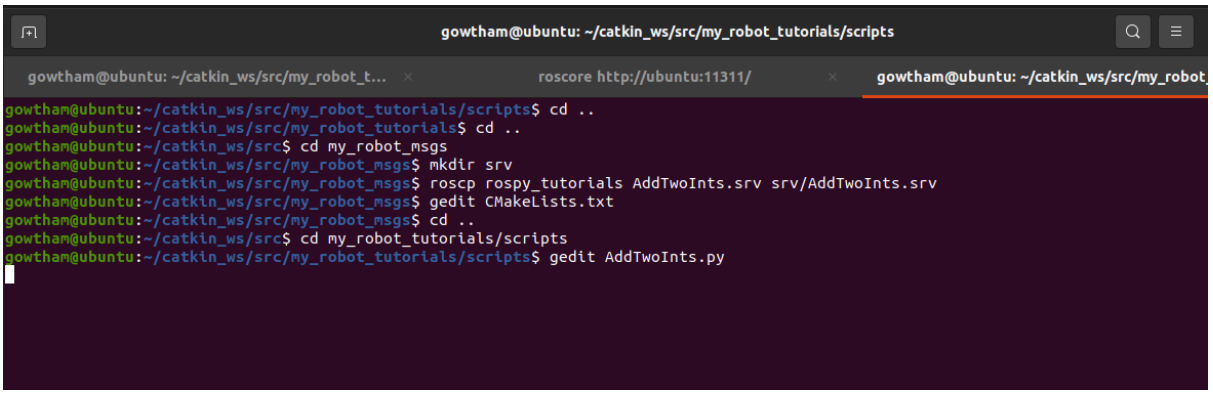
- In the Already Created my_robot_msgs package create a new folder called srv
- Create a service in it and add input and return data types
- Make the appropriate changes in CMakeLists.txt to recogonize the service created







- Create a server in my_robot_tutorials/scripts



Open ▾ | Addnumbers.py ~/catkin_ws/src/my_robot_tutorials/scripts

Addnumbers.py

```python
#!/usr/bin/env python3

import rospy
from my_robot_msgs.srv import AddTwoInts


def handle(req):
        result = req.a+req.b
        rospy.loginfo(f'Returning {req.a} + {req.b} = {result}')
        return result

if __name__ == "__main__":
        rospy.init_node("Add Two Integers server")
        rospy.loginfo("Add two ints server node created")
        s = rospy.Service("/add_two_ints",AddTwoInts,handle)
        rospy.loginfo("Ready To add Two ints")
        rospy.spin()
```

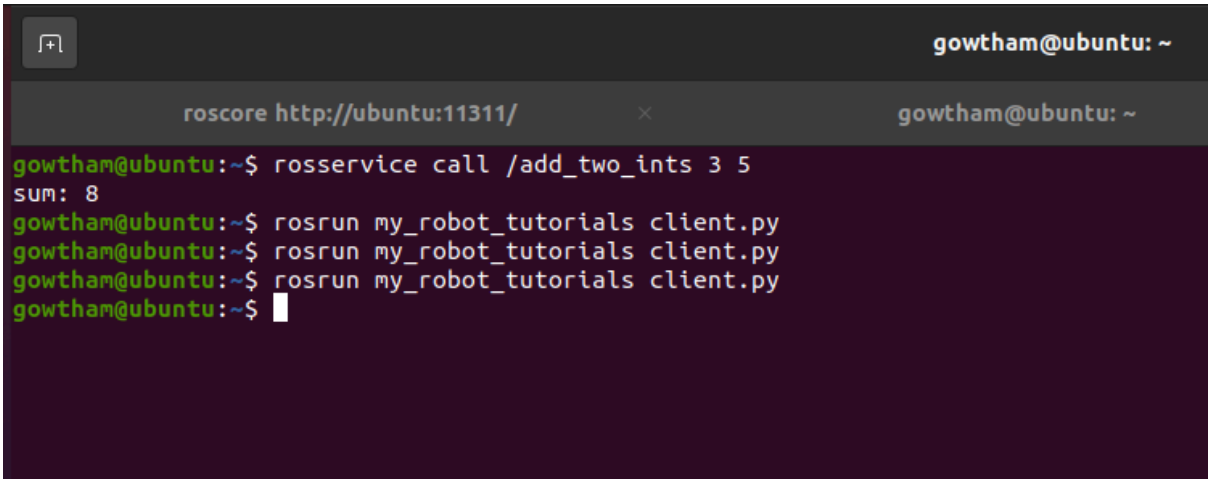
- Create a client in my_robot_tutorials/scripts

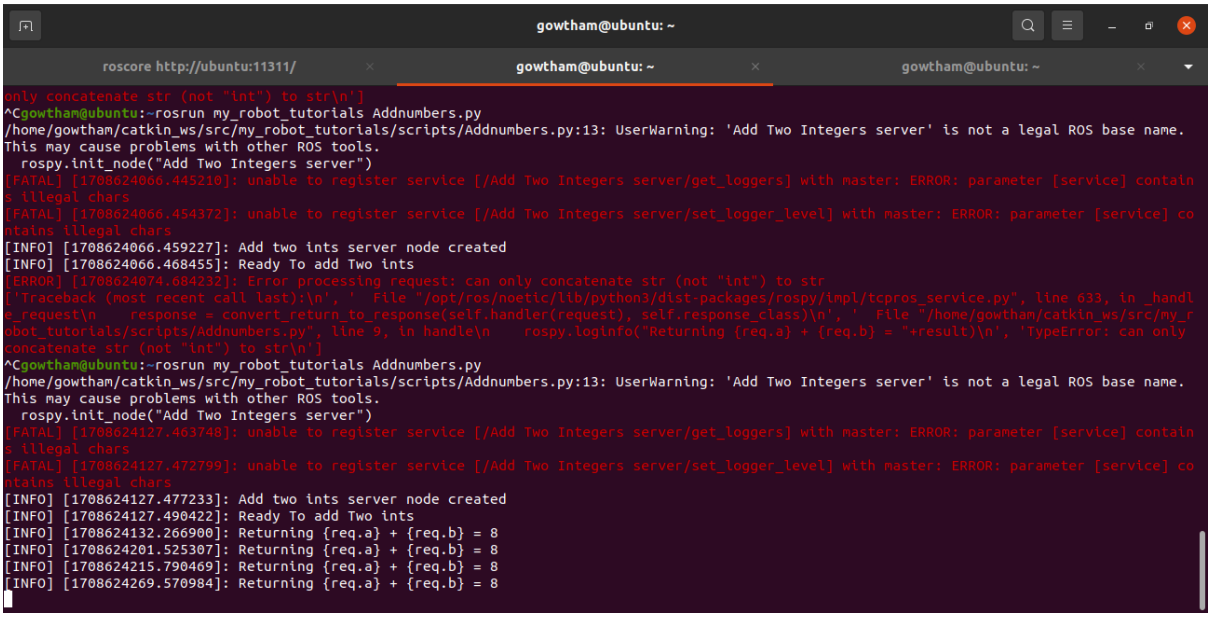
Open ▾ | client.py ~/catkin_ws/src/my_robot_tutorials/scripts

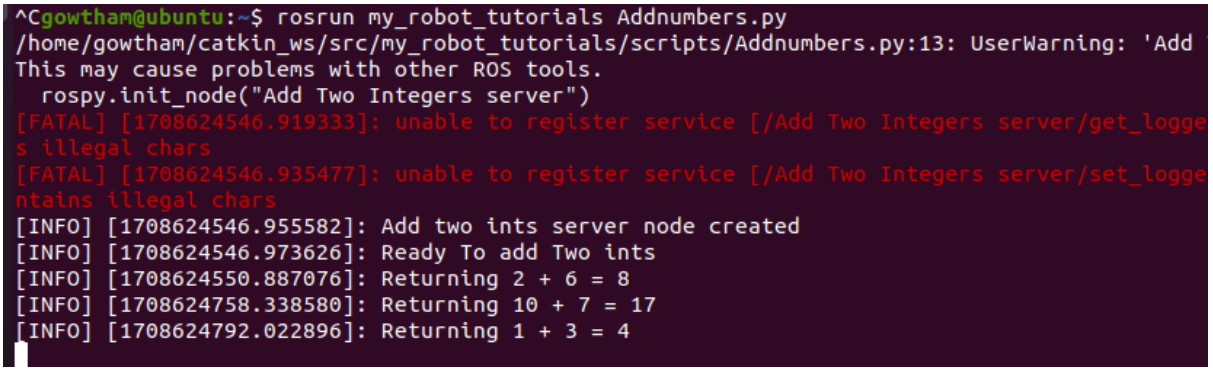
Addnumbers.py

```python
#!/usr/bin/env python3

import rospy
from my_robot_msgs.srv import *


if __name__=="__main__":
        rospy.loginfo("add_two_ints_client")
        rospy.wait_for_service("/add_two_ints")
        try:
                add_two_ints = rospy.ServiceProxy("/add_two_ints",AddTwoInts)
                resp1 = add_two_ints(2,6)
                rospy.loginfo("The Sum is {resp1.sum}")
        except rospy.ServiceException as e:
                rospy.logwarn(f"Service call failed: {e}")
```

Output:







2. Conversion of Meter to Feet.

- In the Already Created my_robot_msgs package create a new folder called srv
- Create a service in it and add input and return data types

MetersToFeet.py

```
int64 LengthInMeters
---
float32 LengthInFeet
bool Status
```

- Make the appropriate changes in CMakeLists.txt to recogonize the service created

MetersToFeet.srv CMakeLis

```
  HardwareStatus.msg
)

## Generate services in the 'srv' folder
add_service_files(
  FILES
  AddTwoInts.srv
  MetersToFeet.srv
)

## Generate actions in the 'action' folder
# add_action_files(
#   FILES
#   Action1.action
#   Action2.action
# )

## Generate added messages and services with any dependencies listed here
generate_messages(
  DEPENDENCIES
  std_msgs
)

################################################
```

- Create a server in my_robot_tutorials/scripts

MetersToFeet.py
~/catkin_ws/src/my_robot_tutorials/scripts

MetersToFeet.srv | CMakeLists.txt | MetersToFeet.py

```
#!/usr/bin/env python3

import rospy
from my_robot_msgs.srv import *


def handle(req):
        result = req.LengthInMeters*3.28084
        rospy.loginfo(f'Given Meter {req.LengthInMeters} is {result} in feet')
        return result

if __name__ == "__main__":
        rospy.init_node("Convertion of meters to feet")
        rospy.loginfo("convert meters to feet")
        s = rospy.Service("/meters_to_feet",MetersToFeet,handle)
        rospy.loginfo("Ready To convert meters to feet")
        rospy.spin()
```

Python 3 | Tab Width: 8 | Ln 12, Col 27 | INS

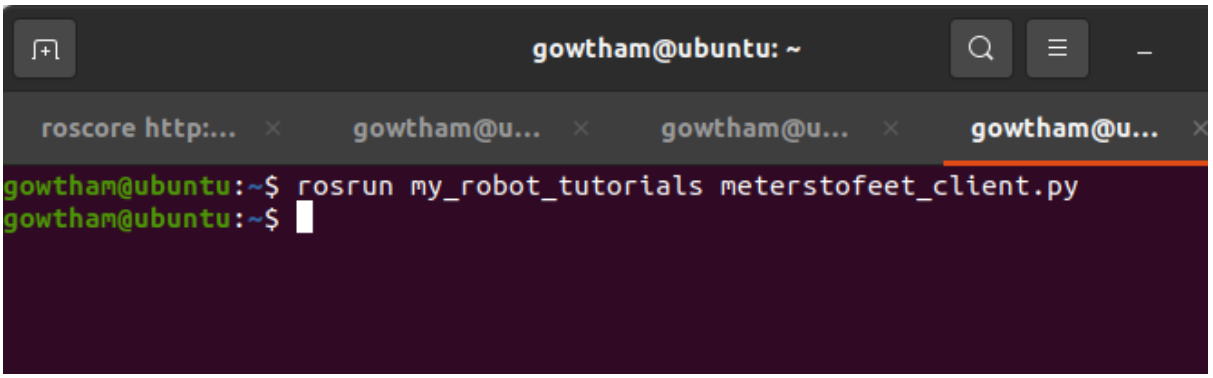
- Create a client in my_robot_tutorials/scripts

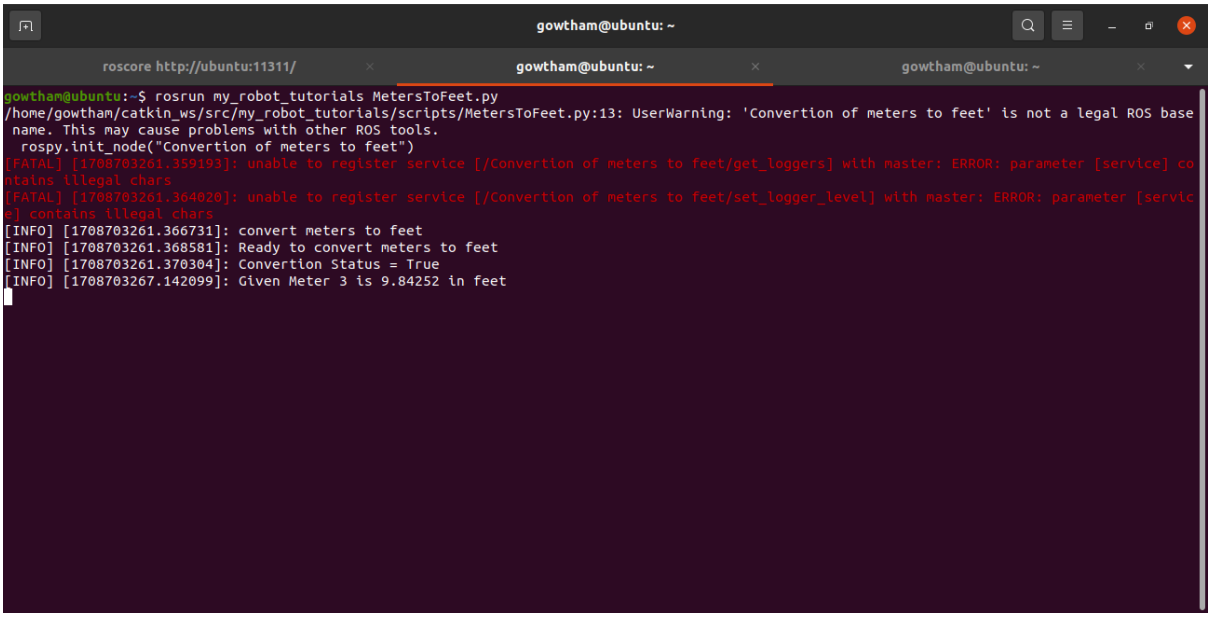
meterstofeet_client.py
~/catkin_ws/src/my_robot_tutorials/scripts

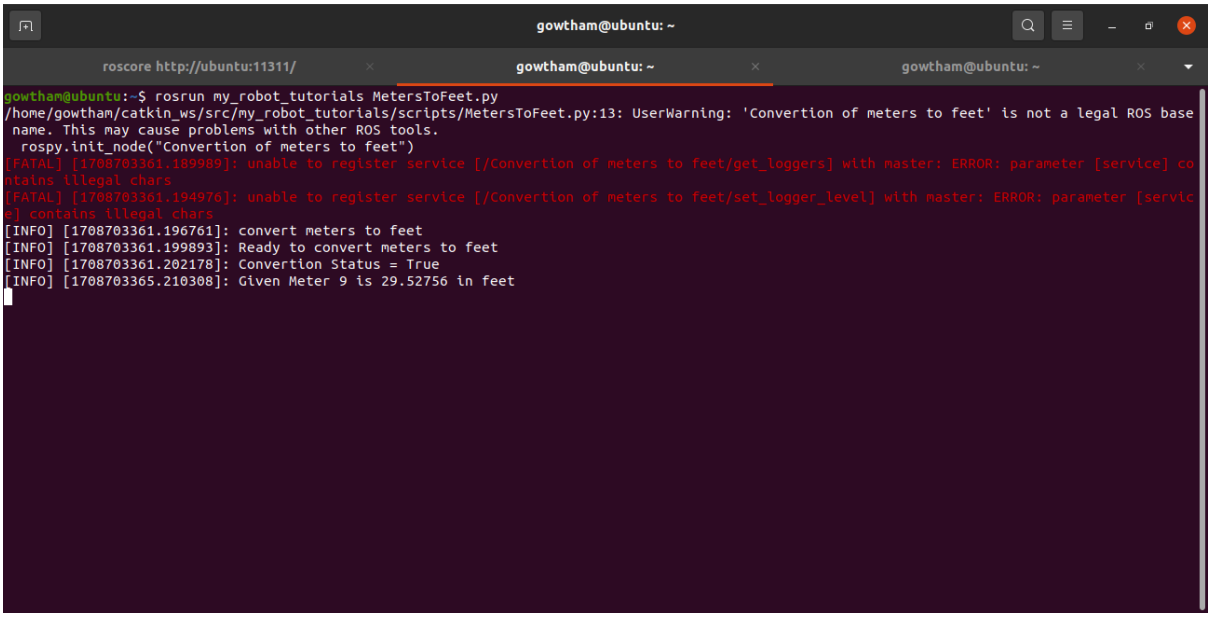
```
#!/usr/bin/env python3

import rospy
from my_robot_msgs.srv import *


if __name__=="__main__":
        rospy.loginfo("Meter to Feet")
        rospy.wait_for_service("/meters_to_feet")
        try:
                add_two_ints = rospy.ServiceProxy("/meters_to_feet",MetersToFeet)
                resp1 = add_two_ints(3)
                rospy.loginfo("The respective feet of the given length in meter is {resp1.LengthInFeet}")
        except rospy.ServiceException as e:
                rospy.logwarn(f"Service call failed: {e}")
```

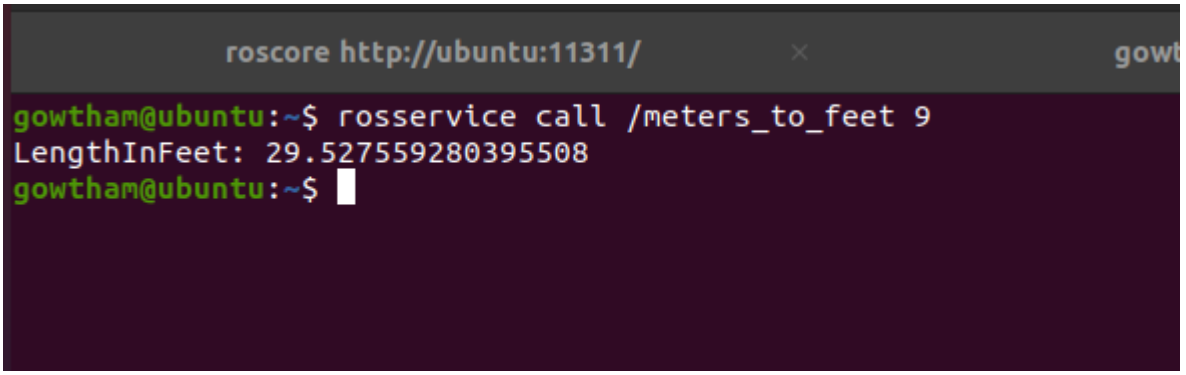
Python 3 | Tab Width: 8 | Ln 16, Col 39 | INS

Output:


gowtham@ubuntu: ~
roscore http:...
gowtham@u...
gowtham@u...
gowtham@u...
gowtham@ubuntu:~$ rosrun my_robot_tutorials meterstofeet_client.py
gowtham@ubuntu:~$


gowtham@ubuntu: ~
roscore http://ubuntu:11311/
gowtham@ubuntu: ~
gowtham@ubuntu: ~
gowtham@ubuntu:~$ rosrun my_robot_tutorials MetersToFeet.py
/home/gowtham/catkin_ws/src/my_robot_tutorials/scripts/MetersToFeet.py:13: UserWarning: 'Convertion of meters to feet' is not a legal ROS base
name. This may cause problems with other ROS tools.
rospy.init_node("Convertion of meters to feet")
[FATAL] [1708703261.359193]: unable to register service [/Convertion of meters to feet/get_loggers] with master: ERROR: parameter [service] co
ntains illegal chars
[FATAL] [1708703261.364020]: unable to register service [/Convertion of meters to feet/set_logger_level] with master: ERROR: parameter [servic
e] contains illegal chars
[INFO] [1708703261.366731]: convert meters to feet
[INFO] [1708703261.368581]: Ready to convert meters to feet
[INFO] [1708703261.370304]: Convertion Status = True
[INFO] [1708703267.142099]: Given Meter 3 is 9.84252 in feet


gowtham@ubuntu: ~
roscore http://ubuntu:11311/
gowtham@ubuntu: ~
gowtham@ubuntu: ~
gowtham@ubuntu:~$ rosrun my_robot_tutorials MetersToFeet.py
/home/gowtham/catkin_ws/src/my_robot_tutorials/scripts/MetersToFeet.py:13: UserWarning: 'Convertion of meters to feet' is not a legal ROS base
name. This may cause problems with other ROS tools.
rospy.init_node("Convertion of meters to feet")
[FATAL] [1708703361.189989]: unable to register service [/Convertion of meters to feet/get_loggers] with master: ERROR: parameter [service] co
ntains illegal chars
[FATAL] [1708703361.194976]: unable to register service [/Convertion of meters to feet/set_logger_level] with master: ERROR: parameter [servic
e] contains illegal chars
[INFO] [1708703361.196761]: convert meters to feet
[INFO] [1708703361.199893]: Ready to convert meters to feet
[INFO] [1708703361.202178]: Convertion Status = True
[INFO] [1708703365.210308]: Given Meter 9 is 29.52756 in feet


roscore http://ubuntu:11311/
gowt
gowtham@ubuntu:~$ rosservice call /meters_to_feet 9
LengthInFeet: 29.527559280395508
gowtham@ubuntu:~$