Lab submission – 2

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Subject: Simulation and modelling

Subject code: CSE3102

Professor: Dr. Christy Jackson J

Slot: L57+L58

Note: assignment done using friend's laptop since ROS is not getting installed in my system

1. Create a simple 1 server and 1 client architecture using ROS rospy.

Server.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts

def handle_add_two_ints(req):
    result = req.a+req.b
    rospy.loginfo("Sum of " +str(req.a)+ " and " +str(req.b) + " is " + str(res>
    return result

if __name__ == '__main__':
    rospy.init_node("add_two_ints_server")
    rospy.loginfo("Add two ints server node created")
    service = rospy.Service("/add_two_ints", AddTwoInts, handle_add_two_ints)
    rospy.loginfo("Service server has been started")
    rospy.spin()
```
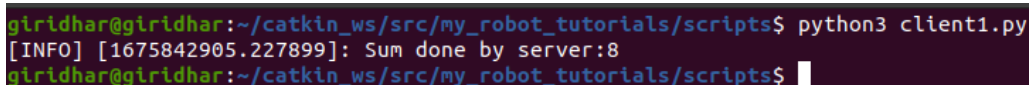
client.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts
if __name__ == '__main__':
    rospy.init_node("add_two_ints_client")
    rospy.wait_for_service("/add_two_ints")
    try:
        add_two_ints = rospy.ServiceProxy("/add_two_ints", AddTwoInts)
        response = add_two_ints(2,6)
        rospy.loginfo("Sum done by server:" +str(response.sum))
    except rospy.ServiceException as e:
        rospy.logwarn("Service failed:" +str(e))
```

Output:

```
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 client1.py
[INFO] [1675842905.227899]: Sum done by server:8
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$
```

```
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 server.py
[INFO] [1675842892.574447]: Add two ints server node created
[INFO] [1675842892.581542]: Service server has been started
[INFO] [1675842905.226005]: Sum of 2 and 6 is 8
```

2. Create a 1 server and 3 client architecture using ROS rospy.

Server.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts

def handle_add_two_ints(req):
    result = req.a+req.b
    rospy.loginfo("Sum of " +str(req.a)+ " and " +str(req.b) + " is " + str(res>
    return result

if __name__ == '__main__':
    rospy.init_node("add_two_ints_server")
    rospy.loginfo("Add two ints server node created")
    service = rospy.Service("/add_two_ints", AddTwoInts, handle_add_two_ints)
    rospy.loginfo("Service server has been started")
    rospy.spin()
```

client1.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts
if __name__ == '__main__':
    rospy.init_node("add_two_ints_client_Prithvi_1")
    rospy.wait_for_service("/add_two_ints")
    try:
        add_two_ints = rospy.ServiceProxy("/add_two_ints", AddTwoInts)
        response = add_two_ints(5,5)
        rospy.loginfo("Sum done by prithvi server(Client1):" +str(response.sum))
```

```
    except rospy.ServiceException as e:
        rospy.logwarn("Service failed:" +str(e))
```

client2.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts
if __name__ == '__main__':
    rospy.init_node("add_two_ints_client_Prithvi_2")
    rospy.wait_for_service("/add_two_ints")
    try:
        add_two_ints = rospy.ServiceProxy("/add_two_ints", AddTwoInts)
        response = add_two_ints(9,4)
        rospy.loginfo("Sum done by prithvi server(Client2):" +str(response.sum))
    except rospy.ServiceException as e:
        rospy.logwarn("Service failed:" +str(e))
```

client3.py

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

import rospy
from rospy_tutorials.srv import AddTwoInts
if __name__ == '__main__':
    rospy.init_node("add_two_ints_client_Prithvi_3")
    rospy.wait_for_service("/add_two_ints")
    try:
        add_two_ints = rospy.ServiceProxy("/add_two_ints", AddTwoInts)
        response = add_two_ints(1,8)
        rospy.loginfo("Sum done by prithvi server(Client3):" +str(response.sum))
    except rospy.ServiceException as e:
        rospy.logwarn("Service failed:" +str(e))
```

Output:

```
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 server.py
[INFO] [1675843223.275919]: Add two ints server node created
[INFO] [1675843223.283381]: Service server has been started
[INFO] [1675843235.143442]: Sum of 5 and 5 is 10
[INFO] [1675843249.875746]: Sum of 9 and 4 is 13
[INFO] [1675843262.495859]: Sum of 1 and 8 is 9
```

```
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 client1.py
[INFO] [1675843235.145598]: Sum done by prithvi server(Client1):10
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 client2.py
[INFO] [1675843249.884977]: Sum done by prithvi server(Client2):13
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ python3 client3.py
[INFO] [1675843262.502155]: Sum done by prithvi server(Client3):9
giridhar@giridhar:~/catkin_ws/src/my_robot_tutorials/scripts$ 
```

3. **Create a server client architecture with other message types referring to the ROS doc.**

Server.py

```
Import rospy
From std_srvs.srv import Trigger, TriggerResponse

Def handle_append_strings(req):
        String1 = "Prithviraj"
        String2 = "Guntha"
        response = TriggerResponse()
        response.success = True
        response.message = string1 + " " + string2
        return response

if __name__ == "__main__":
        rospy.init_node("append_strings_server")
        rospy.loginfo("strings Append Server Node is Created")
        service = rospy.Service("append_strings",Trigger, handle_append_strings)
        rospy.spin()
```

client.py

```
import rospy
import sys
from std_srvs.srv import Trigger, TriggerRequest

def append_strings_client(string1,string2):
        rospy.wait_for_service("append_strings")
```

```
try:
        append_strings = rospy.ServiceProxy("append_strings",Trigger)
        response = append_strings(TriggerRequest())
        return string1+ " " + string2
except rospy.ServiceException as e:
        print("Service call failed: %s"%e)

if __name__ == "__main__":
    string1 = sys.argv[1]
    string2 = sys.argv[2]
    result = append_strings_client(string1,string2)
    print(result)
```

Output:

```
kailash@Kailash-Linux:~/catkin_ws/src/sim/src/scripts/lab2$ python3 q3_datatype_c.py "Prithviraj" "Guntha_20BRS1188"
Prithviraj Guntha_20BRS1188
kailash@Kailash-Linux:~/catkin_ws/src/sim/src/scripts/lab2$
```

```
$ python3 q3_datatype_c.py "Prithviraj" "Guntha_20BRS1188"
```

```
Prithviraj Guntha_20BRS1188
```