



ÉCOLE NATIONALE SUPÉRIEURE DE TECHNIQUES AVANCÉES

ROB311

Homework 1

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1 Step by Step

1.1 setting up

After setting up the workspace by following the tutorials and examples, I had already defined my “ros_workspace”. Remember that everything was done in the Ubuntu20.04 terminal running on Windows 11 Pro.

```
$ cd ~/ros_workspace/src
```

Inside the workspace, I created the ROS package “homework_1”.

```
$ catkin_create_pkg homework_1 std_msgs rospy roscpp
```

In it, I created the “scripts” folder where I saved the code for the 4 nodes.

```
$ mkdir scripts
```

```
$ touch scripts/node_A.py scripts/node_B.py scripts/node_C.py
```

1.2 About the code

It was requested to create a logic similar to ‘Chinese whispers,’ where one node would receive a message from the previous node and forward it. From there, to define it a bit further, the idea was that node A would pass the message ‘test’ to node B, which would add ‘B’ to the end of the message, and so on. When the message returned to node A for the third time, the program would be terminated.

This leaves the code for node A as follows :

```
1  #!/usr/bin/env python3
2
3  import rospy
4  from std_msgs.msg import String
5
6  # Global counter to track how many times the message comes back to node A
7  return_count = 0
8
9  def callback(msg):
10     global return_count
11     rospy.loginfo("Node A received: %s", msg.data)
12
13     if return_count < 2: # Message hasn't come back 3 times yet
14         return_count += 1
15         rospy.loginfo("Returning message for the %d time", return_count)
```

```

16         pub.publish(msg.data + "A") # Add "A" and publish again
17     else:
18         rospy.loginfo("Message received for the third time. Stopping...")
19         rospy.signal_shutdown("Third reception completed") # Stop after 3rd time
20
21 # Initialize node A
22 rospy.init_node('node_A')
23
24 # Publishes on the topic 'topic_B'
25 pub = rospy.Publisher('topic_B', String, queue_size=10)
26
27 # Subscribes to the topic 'topic_A'
28 sub = rospy.Subscriber('topic_A', String, callback)
29
30 # Publish initial message
31 rospy.sleep(1) # Wait for everything to initialize
32 pub.publish("teste")
33
34 # Keeps the node running
35 rospy.spin()

```

The code for the other nodes doesn't include the cycle-counting part, only the message-receiving and message-publishing task.

```

1 #!/usr/bin/env python3
2
3 import rospy
4 from std_msgs.msg import String
5
6 def callback(msg):
7     rospy.loginfo("Node B received: %s", msg.data)
8     pub.publish(msg.data + "B") # Adds "B" to the message
9
10 # Initialize node B
11 rospy.init_node('node_B')
12
13 # Publishes on the topic 'topic_C'
14 pub = rospy.Publisher('topic_C', String, queue_size=10)
15
16 # Subscribes to the topic 'topic_B'
17 sub = rospy.Subscriber('topic_B', String, callback)
18
19 # Keeps the node running

```

1.3 Code execution

To run the created program, 5 terminals were opened : 1 for the roscore and the others for running the nodes.

To run the roscore :

```
$ cd ros_workspace/  
$ roscore
```

To run the nodes, it is done as follows for node A, but replacing the ending for each node :

```
$ rosrun homework_1 node_A.py
```

As a result, the following is seen :

```
diego@asus15: ~$ rosrun homework1 node_A.py
[INFO] [1727656646.018579]: Node A received: testeBCABC
[INFO] [1727656646.021137]: Returning message for the 2 time
[INFO] [1727656646.029268]: Node A received: testeBCABCABCAB
[INFO] [1727656646.031863]: Message received for the third time. Stopping...
diego@asus15:~$ rosrun homework1 node_A.py
[INFO] [1727656738.870599]: Node A received: testeBC
[INFO] [1727656738.873945]: Returning message for the 1 time
[INFO] [1727656738.881851]: Node A received: testeBCABC
[INFO] [1727656738.883196]: Returning message for the 2 time
[INFO] [1727656738.890293]: Node A received: testeBCABCABCAB
[INFO] [1727656738.893493]: Message received for the third time. Stopping...
diego@asus15:~$ rosrun homework1 node_A.py
[INFO] [1727657497.365386]: Node A received: testeBCD
[INFO] [1727657497.367794]: Returning message for the 1 time
[INFO] [1727657497.377381]: Node A received: testeBCDABCBD
[INFO] [1727657497.399208]: Returning message for the 2 time
[INFO] [1727657497.390401]: Node A received: testeBCDABCABCBD
[INFO] [1727657497.392449]: Message received for the third time. Stopping...
diego@asus15:~$

diego@asus15: ~$ rosrun homework1 node_B.py
[INFO] [1727656621.389686]: Node B received: testeB
[INFO] [1727656621.322180]: Node B received: testeBCABC
[INFO] [1727656621.333182]: Node B received: testeBCABCABCAB
^[[A][B[INFO] [1727656649.804801]: Node C received: testeB
[INFO] [1727656409.814502]: Node D received: testeBCABC
[INFO] [1727656409.825258]: Node C received: testeBCABCABCAB
[INFO] [1727656603.844258]: Node C received: testeB
[INFO] [1727656603.854929]: Node C received: testeBCABC
[INFO] [1727656603.864604]: Node C received: testeBCABCABCAB
[INFO] [1727656603.866930]: Node C received: testeB
[INFO] [1727656646.015680]: Node C received: testeBCABC
[INFO] [1727656646.026746]: Node C received: testeBCABCABCAB
[INFO] [1727656738.868064]: Node C received: testeB
[INFO] [1727656738.878783]: Node C received: testeBCABC
[INFO] [1727656738.887456]: Node C received: testeBCABCABCAB
[INFO] [1727657497.385904]: Node C received: testeBCABC
[INFO] [1727657497.392213]: Node C received: testeBCDABC
[INFO] [1727657497.385893]: Node C received: testeBCDABCABCDB

diego@asus15: ~$ rosrun homework1 node_B.py
[INFO] [1727656621.389686]: Node B received: testeB
[INFO] [1727656621.319570]: Node B received: testeBCA
[INFO] [1727656261.330233]: Node B received: testeBCABCABA
[INFO] [1727656409.801777]: Node B received: testeB
[INFO] [1727656409.812435]: Node B received: testeBCA
[INFO] [1727656409.822244]: Node B received: testeBCABCABA
[INFO] [1727656603.842040]: Node B received: testeB
[INFO] [1727656603.852807]: Node B received: testeBCA
[INFO] [1727656603.862851]: Node B received: testeBCABCABA
[INFO] [1727656646.003482]: Node B received: testeB
[INFO] [1727656646.013566]: Node B received: testeBCA
[INFO] [1727656646.024210]: Node B received: testeBCABCABA
[INFO] [1727656738.865300]: Node B received: testeB
[INFO] [1727656738.876613]: Node B received: testeBCA
[INFO] [1727656738.885273]: Node B received: testeBCABCABA
[INFO] [1727657497.383233]: Node B received: testeBCDA
[INFO] [1727657497.370831]: Node B received: testeBCDA
[INFO] [1727657497.382215]: Node B received: testeBCDABCDA

diego@asus15: ~$ cd ~/ros_workspace/build/
#####
##### Running command: "make -j8 -l8" in "/home/diego/ros_workspace/build"
#####
diego@asus15:~/ros_workspace$ source devel/setup.bash
diego@asus15:~/ros_workspace$ cd
diego@asus15:~$ rosrun homework1 node_D.py
[INFO] [1727656646.008512]: Node D received: testeBCB
[INFO] [1727656646.018240]: Node D received: testeBCABC
[INFO] [1727656646.029249]: Node D received: testeBCABCABCAB
[INFO] [1727656738.870522]: Node D received: testeBCB
[INFO] [1727656738.880991]: Node D received: testeBCABC
[INFO] [1727656738.890395]: Node D received: testeBCABCABCAB
[INFO] [1727657378.795303]: Node D received: testeB
[INFO] [1727657497.362804]: Node D received: testeBCB
[INFO] [1727657497.374808]: Node D received: testeBCDABC
[INFO] [1727657497.387614]: Node D received: testeBCDABCABCDB
```

FIGURE 1 – Code execution.

1.4 Git

Once completed, all the material was published on GitHub and can be accessed at the following link :

https://github.com/diegopincer/ROB311_2025/tree/HW1

The content relating to this homework assignment is in branch HW1.