-22AIE442-
ROBOTICS AND OPERATING SYSTEMS

Labsheet 3

Q1)

a) Write a program in python to count the number of words in a string.
b) Embed the pseudocode in the publisher program.
c) Write a subscriber to read the result

Note: Design and write code for two versions

I)   Without user input from console
II)   With user input from console

I – No User Input

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def Publisher():
    rospy.init_node('publisher1', anonymous=True)
    pub = rospy.Publisher('nogui', String, queue_size=10)
    rate = rospy.Rate(1)
    string = "Hello world test test test".strip()
    count = len(string.split())
    while not rospy.is_shutdown():
        pub.publish(f'Word Count: {count}')
        rospy.loginfo(f'Word Count Published: {count}')
        rate.sleep()
if __name__ == '__main__':
    try:
        Publisher()
    except rospy.ROSInterruptException:
        pass
```

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def callback(data):
    rospy.loginfo(f"I received: {data.data}")
def subscriber():
    rospy.init_node('subscriber1', anonymous=True)
    rospy.Subscriber('nogui', String, callback)
    rospy.spin()
if __name__ == '__main__':
    try:
        subscriber()
    except rospy.ROSInterruptException:
        pass
```

```
giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3sub1.py
[INFO] [1728745653.398064]: I received: Word Count: 5
[INFO] [1728745654.398197]: I received: Word Count: 5
[INFO] [1728745655.398170]: I received: Word Count: 5
[INFO] [1728745656.398152]: I received: Word Count: 5
[INFO] [1728745657.399063]: I received: Word Count: 5
giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3pub1.py
[INFO] [1728746290.390371]: Word Count Published: 5
[INFO] [1728746291.391256]: Word Count Published: 5
[INFO] [1728746292.392224]: Word Count Published: 5
[INFO] [1728746293.392012]: Word Count Published: 5
```

II – With User Input

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def Publisher():
    rospy.init_node('publisher2', anonymous=True)
    pub = rospy.Publisher('nogui', String, queue_size=10)
    while not rospy.is_shutdown():
        string = input("Enter a string: ").strip()
        count = len(string.split())
        pub.publish(f'Word Count: {count}')
if __name__ == '__main__':
    try:
        Publisher()
    except rospy.ROSInterruptException:
        pass
```

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def callback(data):
    rospy.loginfo(f"I received: {data.data}")
def subscriber():
    rospy.init_node('subscriber1', anonymous=True)
    rospy.Subscriber('nogui', String, callback)
    rospy.spin()
if __name__ == '__main__':
    try:
        subscriber()
    except rospy.ROSInterruptException:
        pass
```

```
giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3pub2.py
Enter a string: Hello World
Enter a string: My name is Girish
Enter a string: What is your name test for seven
Enter a string: hi
Enter a string: stop this
Enter a string: |
```

```
giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3sub1.py
[INFO] [1728746557.616215]: I received: Word Count: 2
[INFO] [1728746564.969874]: I received: Word Count: 4
[INFO] [1728746583.823129]: I received: Word Count: 7
[INFO] [1728746592.467940]: I received: Word Count: 1
[INFO] [1728746598.720649]: I received: Word Count: 2
```

Q2)

a) Create a GUI to publish data
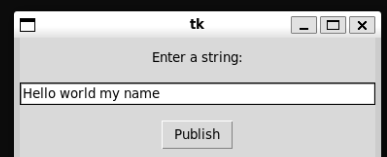b) Create a GUI to subscribe data

I – Publisher with GUI

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
import tkinter as tk
def publish():
    data = entry.get()
    count = len(data.split())
    pub.publish(f'Word Count: {count}')
    rospy.loginfo(f'Recieved Data: {data}')
def publisher():
    global pub
    rospy.init_node('publisher3', anonymous=True)
    pub = rospy.Publisher('withgui', String, queue_size=10)
    root = tk.Tk()
    label = tk.Label(root, text="Enter a string:")
    label.pack(pady=10)
    entry = tk.Entry(root, width=40)
    entry.pack(pady=5)
    button = tk.Button(root, text="Publish", command=publish)
    button.pack(pady=10)
    root.mainloop()
if __name__ == '__main__':
    try:
        publisher()
    except rospy.ROSInterruptException:
        pass
```

```
giriirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3pub3.py
[INFO] [1728747423.704569]: Recieved Data: Hello world my name
```

```
tk                                    _ □ ×
            Enter a string:
Hello world my name
                      Publish
```

II – Subscriber with GUI

```python
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
import tkinter as tk
from tkinter import messagebox
def callback(data):
    root.after(0, show_message, f"Message: {data.data}")
def show_message(message):
    messagebox.showinfo("Received Message", message)
def subscriber():
    global root
    rospy.init_node('subscriber2', anonymous=True)
    rospy.Subscriber('withgui', String, callback)
    root = tk.Tk()
    root.protocol("WM_DELETE_WINDOW", on_close)
    root.mainloop()
def on_close():
    rospy.signal_shutdown("GUI closed")

    root.destroy()

if __name__ == '__main__':
    try:
        subscriber()
    except rospy.ROSInterruptException:
        pass
```
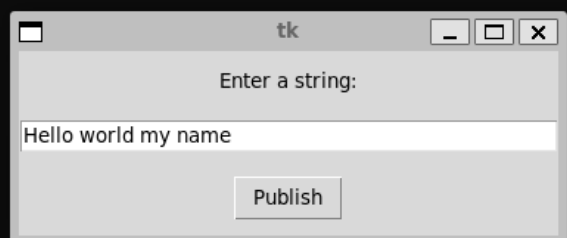
giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3sub2.py

Received Message
Message: Word Count: 4
OK

tk
Enter a string:
Hello world my name
Publish

giriiirig@DESKTOP-O7BKI3U:~/catkin_ws/src/lab3/src$ rosrun lab3 lab3sub2.py

Received Message
Message: Word Count: 5
OK

tk
Enter a string:
test test test test test
Publish