Writing a Simple Publisher and Subscriber (Python)

## **Writing the Publisher Node**

"Node" is the ROS term for an executable that is connected to the ROS network. Here we'll create the publisher ("talker") node which will continually broadcast a message.

Change directory into the beginner\_tutorials package, you created in the earlier tutorial, [creating a package](http://wiki.ros.org/ROS/Tutorials/CreatingPackage):

$ roscd beginner\_tutorials

### **The Code**

First lets create a 'scripts' folder to store our Python scripts in:

$ mkdir scripts

$ cd scripts

Then download the example script [talker.py](https://raw.github.com/ros/ros_tutorials/kinetic-devel/rospy_tutorials/001_talker_listener/talker.py) to your new scripts directory and make it executable:

$ wget https://raw.github.com/ros/ros\_tutorials/kinetic-devel/rospy\_tutorials/001\_talker\_listener/talker.py

$ chmod +x talker.py

You can view and edit the file with  $ rosed beginner\_tutorials talker.py  or just look below.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[1](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_1) #!/usr/bin/env python

[2](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_2) # license removed for brevity

[3](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_3) import rospy

[4](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_4) from std\_msgs.msg import String

[5](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_5)

[6](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_6) def talker():

[7](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_7) pub = rospy.Publisher('chatter', String, queue\_size=10)

[8](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_8) rospy.init\_node('talker', anonymous=True)

[9](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_9) rate = rospy.Rate(10) # 10hz

[10](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_10) while not rospy.is\_shutdown():

[11](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_11) hello\_str = "hello world %s" % rospy.get\_time()

[12](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_12) rospy.loginfo(hello\_str)

[13](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_13) pub.publish(hello\_str)

[14](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_14) rate.sleep()

[15](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_15)

[16](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_16) if \_\_name\_\_ == '\_\_main\_\_':

[17](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_17) try:

[18](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_18) talker()

[19](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_19) except rospy.ROSInterruptException:

[20](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c82832e0d612370fe9886563f0b7f5433f6caee1_20) pass

### **The Code Explained**

Now, let's break the code down.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[1](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-da6097954e7fee459e60cb816897ac01d266cf48_1) #!/usr/bin/env python

Every Python ROS [Node](http://wiki.ros.org/Nodes) will have this declaration at the top. The first line makes sure your script is executed as a Python script.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[3](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-fb2d85bed2cdd0892041958808af40a4b2e2619f_3) import rospy

[4](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-fb2d85bed2cdd0892041958808af40a4b2e2619f_4) from std\_msgs.msg import String

You need to import rospy if you are writing a ROS [Node](http://wiki.ros.org/Nodes). The std\_msgs.msg import is so that we can reuse the std\_msgs/String message type (a simple string container) for publishing.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[7](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-0d784dd4f9d2b50d6bfc6dbddf4a45b58f61bbe1_7) pub = rospy.Publisher('chatter', String, queue\_size=10)

[8](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-0d784dd4f9d2b50d6bfc6dbddf4a45b58f61bbe1_8) rospy.init\_node('talker', anonymous=True)

This section of code defines the talker's interface to the rest of ROS. pub = rospy.Publisher("chatter", String, queue\_size=10) declares that your node is publishing to the chatter topic using the message type String. String here is actually the class std\_msgs.msg.String. The queue\_size argument is **New in ROS hydro** and limits the amount of queued messages if any subscriber is not receiving them fast enough. In older ROS distributions just omit the argument.

The next line, rospy.init\_node(NAME, ...), is very important as it tells rospy the name of your node -- until rospy has this information, it cannot start communicating with the ROS [Master](http://wiki.ros.org/Master). In this case, your node will take on the name talker. NOTE: the name must be a [base name](http://wiki.ros.org/Names), i.e. it cannot contain any slashes "/".

anonymous = True ensures that your node has a unique name by adding random numbers to the end of NAME. Refer to [Initialization and Shutdown - Initializing your ROS Node](http://wiki.ros.org/rospy/Overview/Initialization%20and%20Shutdown#Initializing_your_ROS_Node) in the rospy documentation for more information about node initialization options.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[9](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-deeb77cb436e1a6b1a92349b80ed4634d8d9587b_9) rate = rospy.Rate(10) # 10hz

This line creates a Rate object rate. With the help of its method sleep(), it offers a convenient way for looping at the desired rate. With its argument of 10, we should expect to go through the loop 10 times per second (as long as our processing time does not exceed 1/10th of a second!)

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[10](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c119a947845452aa2f89a85d4fb37e402941b0e1_10) while not rospy.is\_shutdown():

[11](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c119a947845452aa2f89a85d4fb37e402941b0e1_11) hello\_str = "hello world %s" % rospy.get\_time()

[12](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c119a947845452aa2f89a85d4fb37e402941b0e1_12) rospy.loginfo(hello\_str)

[13](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c119a947845452aa2f89a85d4fb37e402941b0e1_13) pub.publish(hello\_str)

[14](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c119a947845452aa2f89a85d4fb37e402941b0e1_14) rate.sleep()

This loop is a fairly standard rospy construct: checking the rospy.is\_shutdown() flag and then doing work. You have to check is\_shutdown() to check if your program should exit (e.g. if there is a Ctrl-C or otherwise). In this case, the "work" is a call to pub.publish(hello\_str) that publishes a string to our chatter topic. The loop calls rate.sleep(), which sleeps just long enough to maintain the desired rate through the loop.

(You may also run across rospy.sleep() which is similar to time.sleep() except that it works with simulated time as well (see [Clock](http://wiki.ros.org/Clock)).)

This loop also calls rospy.loginfo(str), which performs triple-duty: the messages get printed to screen, it gets written to the Node's log file, and it gets written to [rosout](http://wiki.ros.org/rosout). [rosout](http://wiki.ros.org/rosout) is a handy tool for debugging: you can pull up messages using [rqt\_console](http://wiki.ros.org/rqt_console) instead of having to find the console window with your Node's output.

std\_msgs.msg.String is a very simple message type, so you may be wondering what it looks like to publish more complicated types. The general rule of thumb is that constructor args are in the same order as in the*.msg*file. You can also pass in no arguments and initialize the fields directly, e.g.

msg = String()

msg.data = str

or you can initialize some of the fields and leave the rest with default values:

String(data=str)

You may be wondering about the last little bit:

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[17](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-03913aa01eb4dc084a8831e8982cf5d7c49e193f_17) try:

[18](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-03913aa01eb4dc084a8831e8982cf5d7c49e193f_18) talker()

[19](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-03913aa01eb4dc084a8831e8982cf5d7c49e193f_19) except rospy.ROSInterruptException:

[20](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-03913aa01eb4dc084a8831e8982cf5d7c49e193f_20) pass

In addition to the standard Python \_\_main\_\_ check, this catches a rospy.ROSInterruptException exception, which can be thrown by rospy.sleep() and rospy.Rate.sleep() methods when Ctrl-C is pressed or your Node is otherwise shutdown. The reason this exception is raised is so that you don't accidentally continue executing code after the sleep().

Now we need to write a node to receive the messages.

## **Writing the Subscriber Node**

### **The Code**

Download the [listener.py](https://raw.github.com/ros/ros_tutorials/kinetic-devel/rospy_tutorials/001_talker_listener/listener.py) file into your scripts directory:

$ roscd beginner\_tutorials/scripts/

$ wget https://raw.github.com/ros/ros\_tutorials/kinetic-devel/rospy\_tutorials/001\_talker\_listener/listener.py

The file contents look close to:

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[1](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_1) #!/usr/bin/env python

[2](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_2) import rospy

[3](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_3) from std\_msgs.msg import String

[4](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_4)

[5](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_5) def callback(data):

[6](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_6) rospy.loginfo(rospy.get\_caller\_id() + "I heard %s", data.data)

[7](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_7)

[8](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_8) def listener():

[9](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_9)

[10](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_10) # In ROS, nodes are uniquely named. If two nodes with the same

[11](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_11) # name are launched, the previous one is kicked off. The

[12](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_12) # anonymous=True flag means that rospy will choose a unique

[13](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_13) # name for our 'listener' node so that multiple listeners can

[14](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_14) # run simultaneously.

[15](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_15) rospy.init\_node('listener', anonymous=True)

[16](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_16)

[17](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_17) rospy.Subscriber("chatter", String, callback)

[18](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_18)

[19](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_19) # spin() simply keeps python from exiting until this node is stopped

[20](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_20) rospy.spin()

[21](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_21)

[22](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_22) if \_\_name\_\_ == '\_\_main\_\_':

[23](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-56fb82d4681d7880a3d3a97f7af70cfe17618f86_23) listener()

Don't forget to make the node executable:

$ chmod +x listener.py

### **The Code Explained**

The code for listener.py is similar to talker.py, except we've introduced a new callback-based mechanism for subscribing to messages.

[Toggle line numbers](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29)

[15](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_15) rospy.init\_node('listener', anonymous=True)

[16](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_16)

[17](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_17) rospy.Subscriber("chatter", String, callback)

[18](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_18)

[19](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_19) # spin() simply keeps python from exiting until this node is stopped

[20](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber%28python%29#rospy_tutorials.2BAC8-Tutorials.2BAC8-WritingPublisherSubscriber.CA-c54953afb3f7ac20abfe7460208d0cd6c36c1d62_20) rospy.spin()

This declares that your node subscribes to the chatter topic which is of type std\_msgs.msgs.String. When new messages are received, callback is invoked with the message as the first argument.

We also changed up the call to rospy.init\_node() somewhat. We've added the anonymous=True keyword argument. ROS requires that each node have a unique name. If a node with the same name comes up, it bumps the previous one. This is so that malfunctioning nodes can easily be kicked off the network. The anonymous=True flag tells rospy to generate a unique name for the node so that you can have multiple listener.py nodes run easily.

The final addition, rospy.spin() simply keeps your node from exiting until the node has been shutdown. Unlike roscpp, rospy.spin() does not affect the subscriber callback functions, as those have their own threads.

## **Building your nodes**

We use CMake as our build system and, yes, you have to use it even for Python nodes. This is to make sure that the autogenerated Python code for messages and services is created.

Go to your catkin workspace and run catkin\_make:

$ cd ~/catkin\_ws

$ catkin\_make

Now that you have written a simple publisher and subscriber, let's [examine the simple publisher and subscriber](http://wiki.ros.org/ROS/Tutorials/ExaminingPublisherSubscriber).