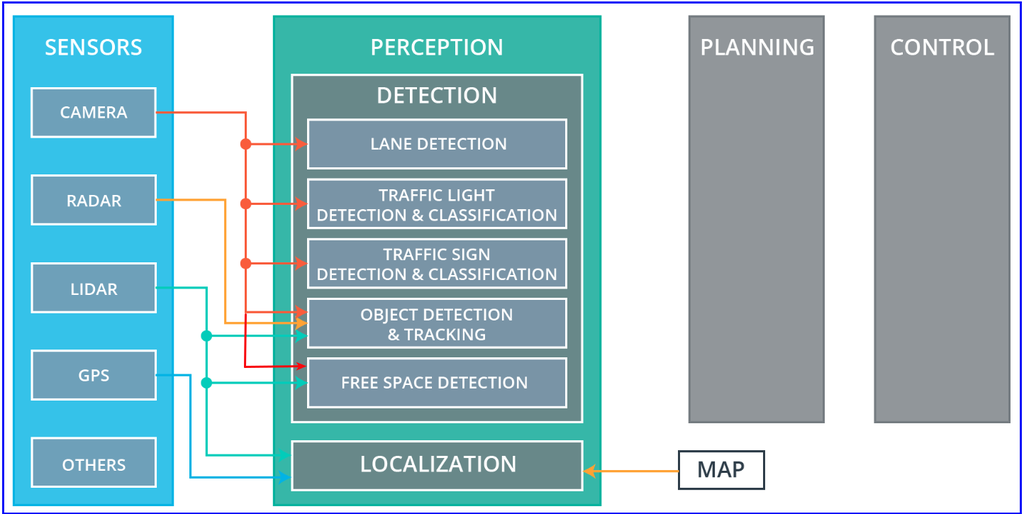
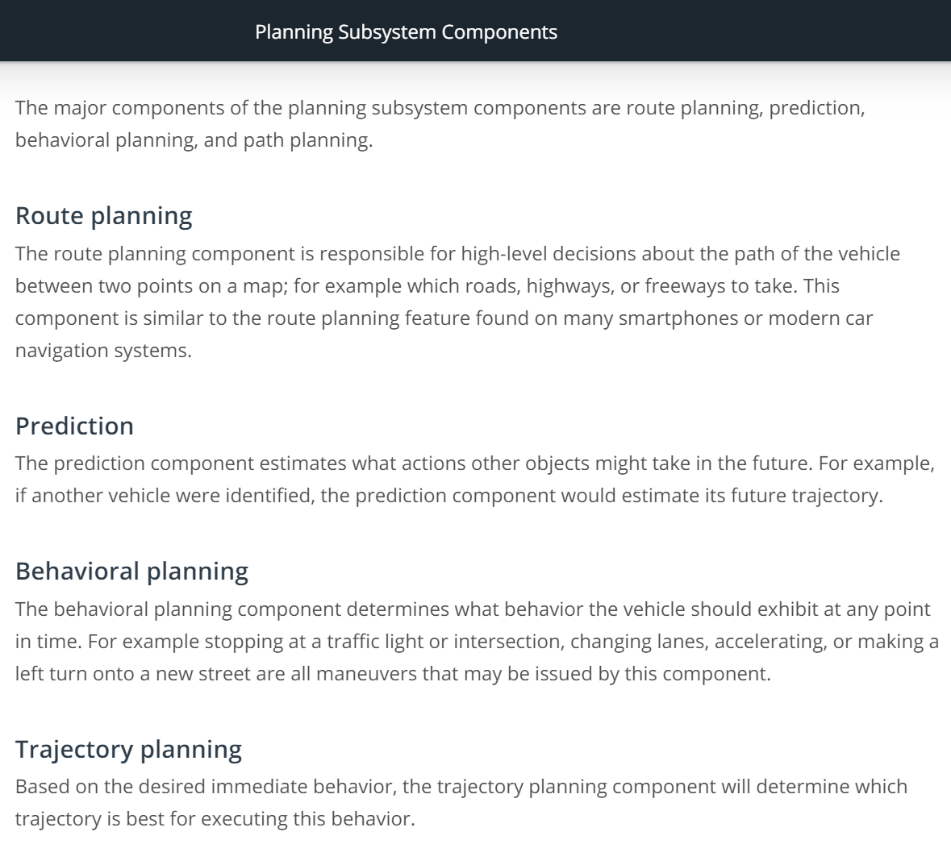
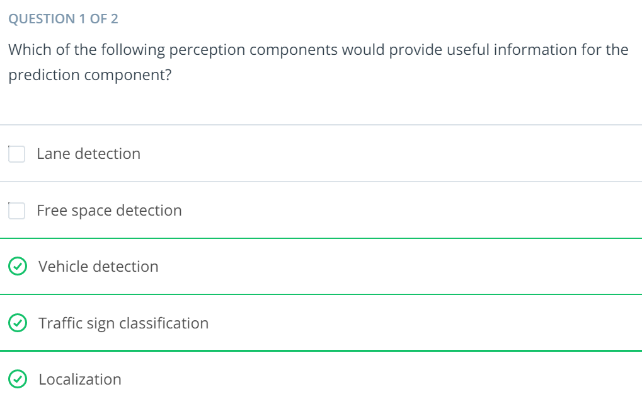


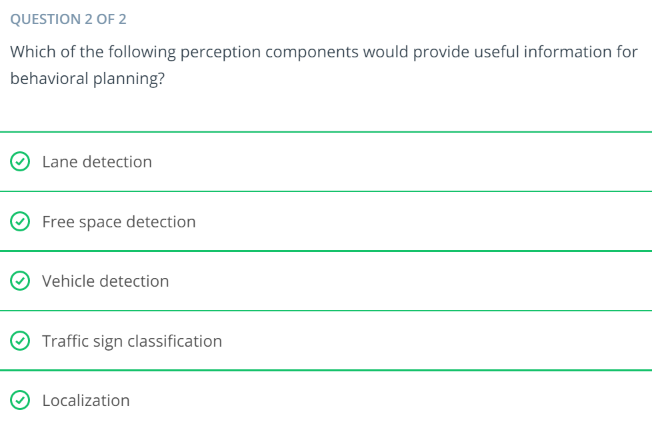
Localization for fully autonomous vehicles is commonly performed using lidar and a map, although all of these sensors could be used for localization (see [here](http://www.mdpi.com/1424-8220/16/3/280/htm) and [here](https://onlinelibrary.wiley.com/doi/full/10.1002/rob.21605) for interesting examples).



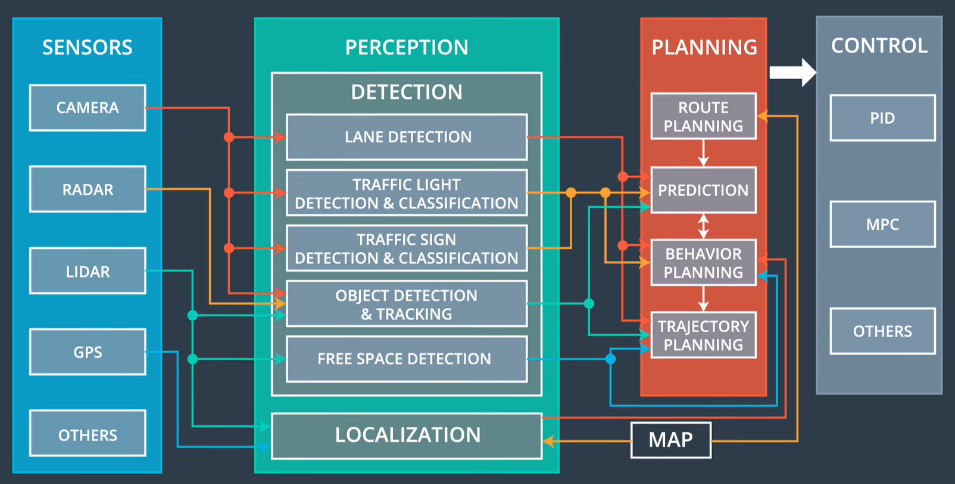


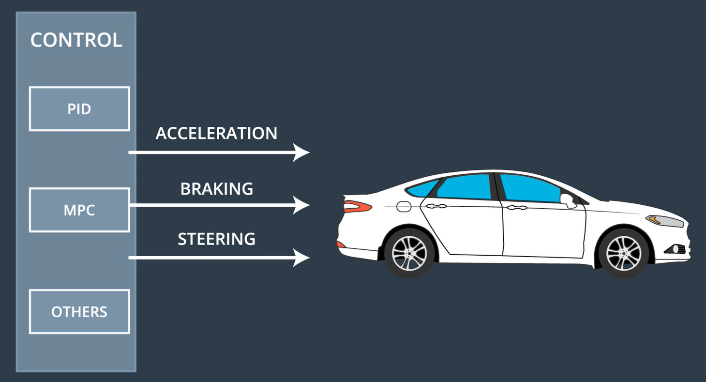


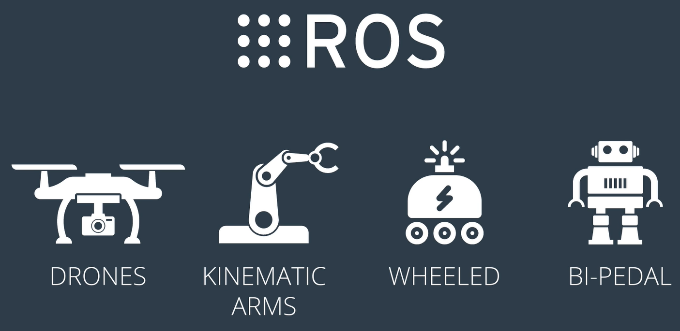
Although localization is unlikely to be used, many of the detection and classification components are needed for a vehicle to make informed predictions, including lane detection, free space detection, vehicle detection, and traffic sign classification.



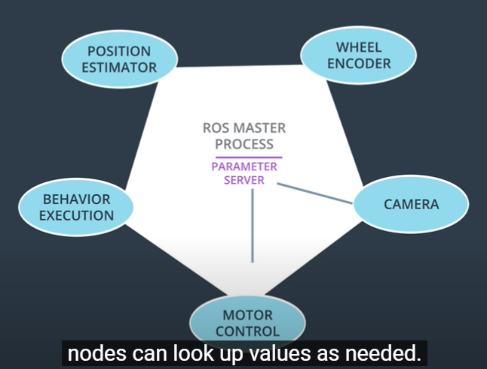
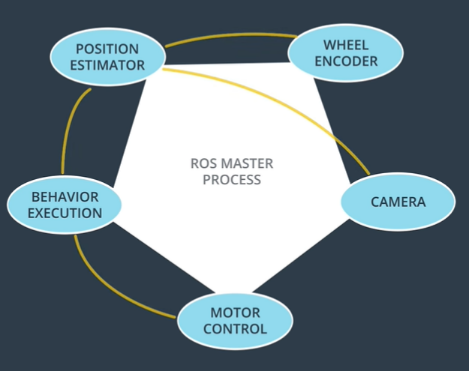






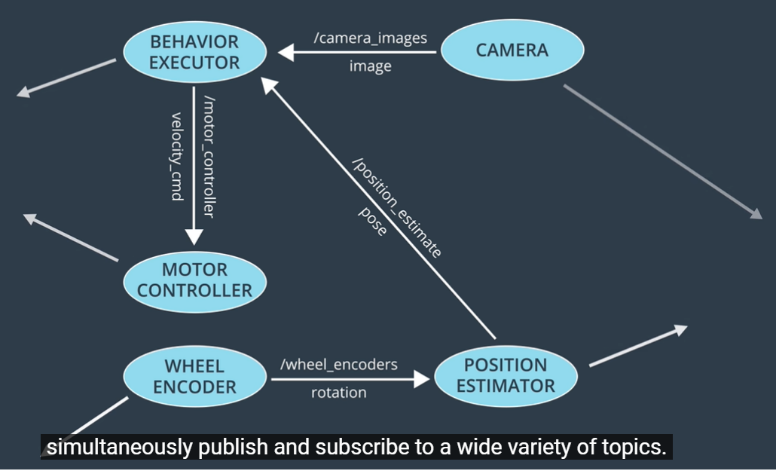


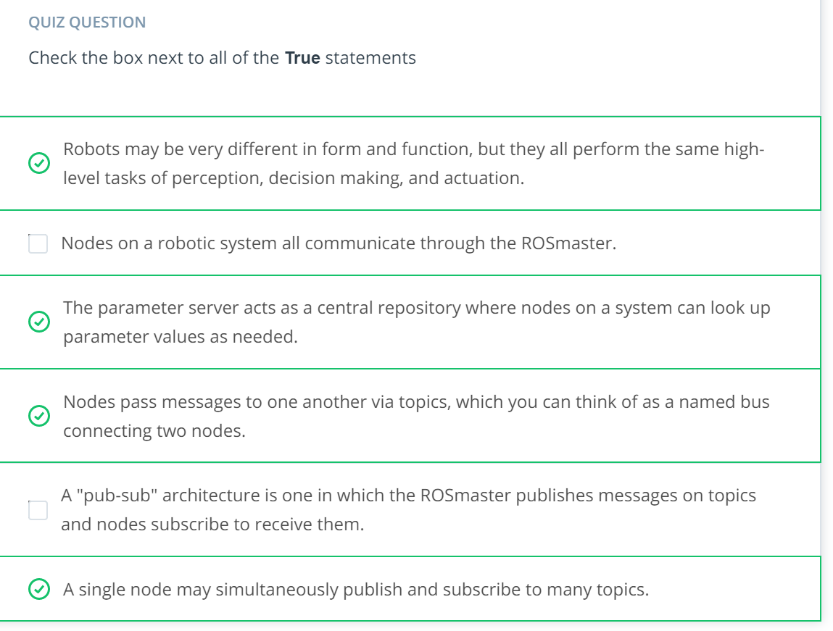






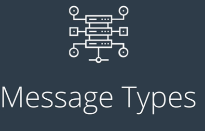
From publishers to subscribers:

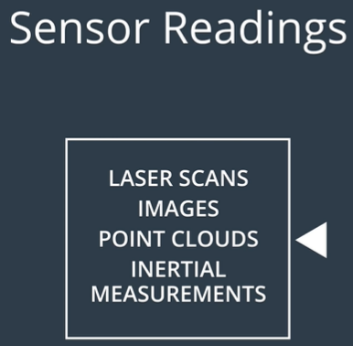
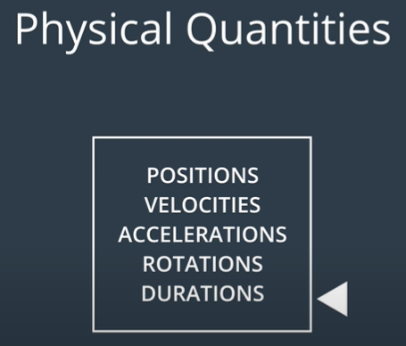


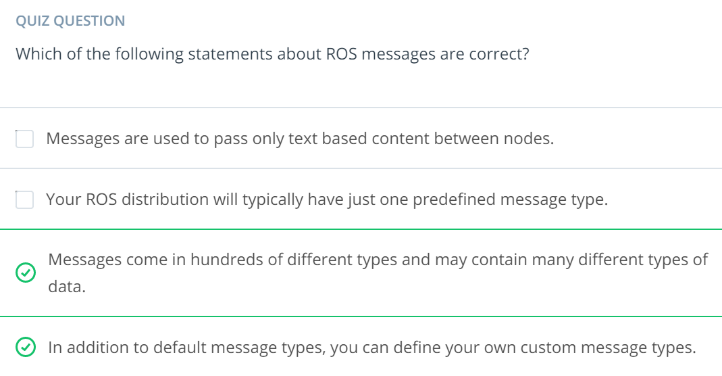


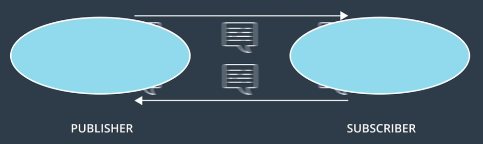
The ROSmaster allows nodes to locate one another, but after that they connect with each other directly.

A "pub-sub" architecture is one in which each node on the system may publish and subscribe to topics.



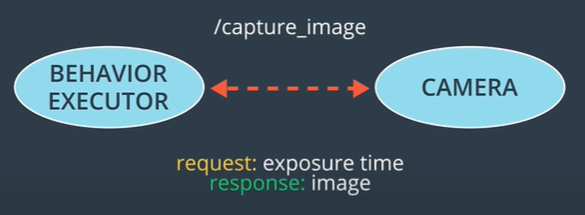


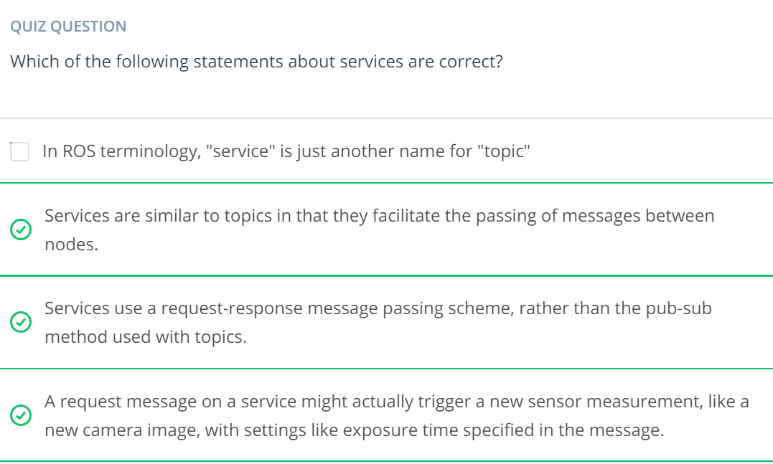


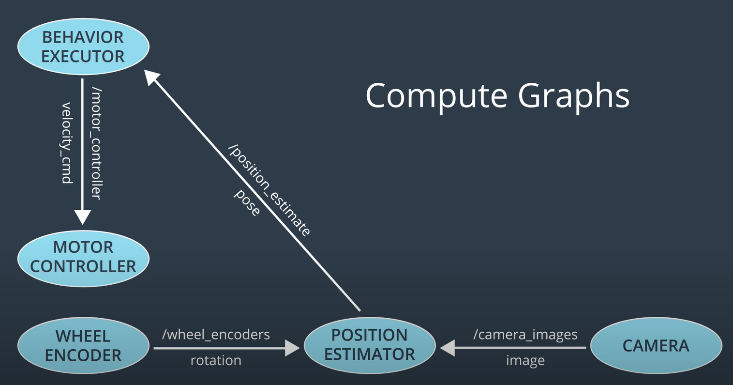


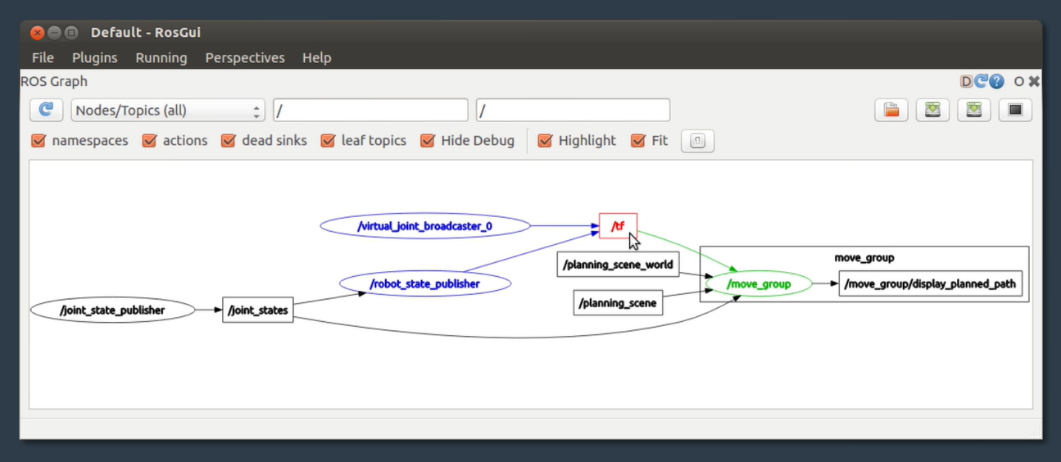


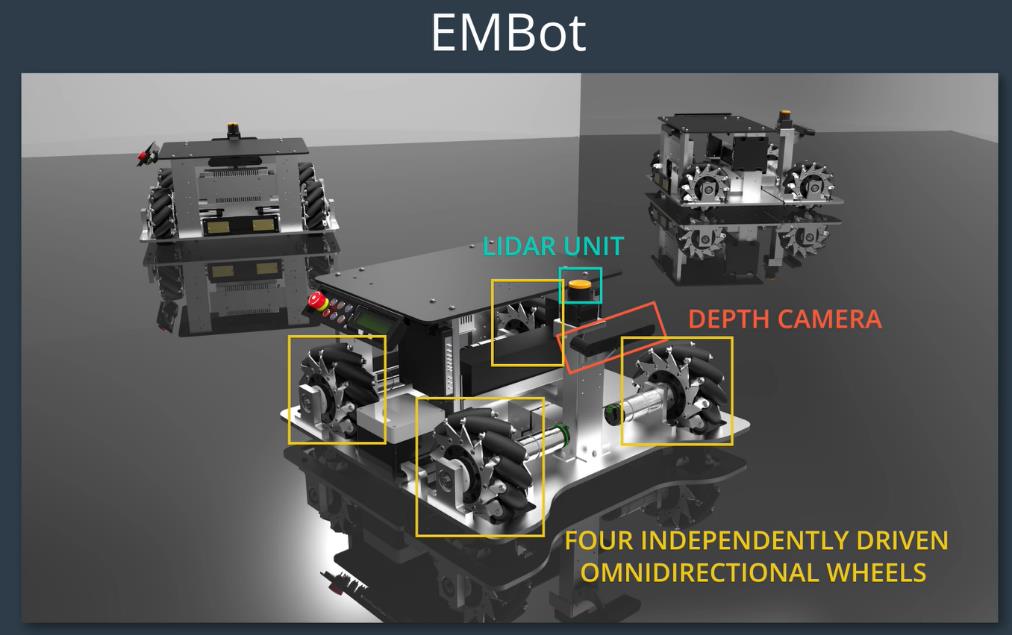


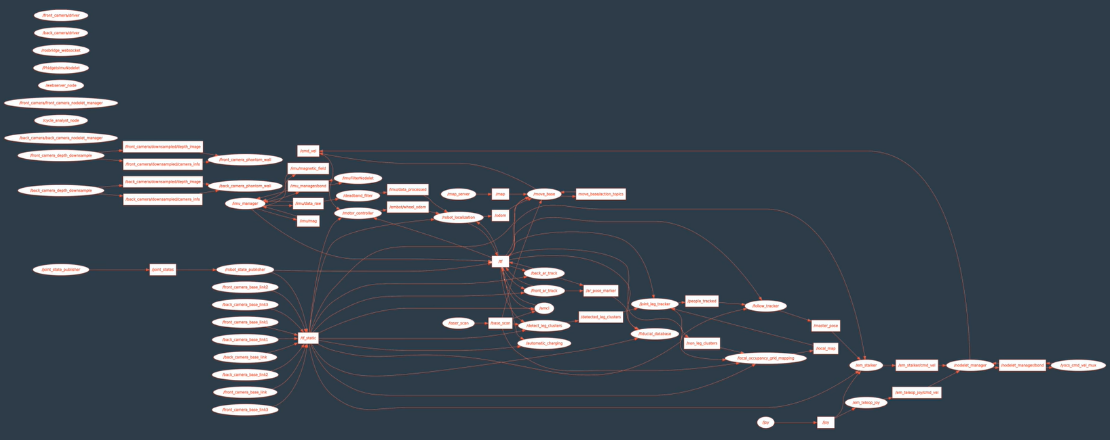












/.bashrc is a bash shell which is automatically run everytime a bash is opened

rosrun 🡪 execute a node

rosnode list:

/rosout This node is launched by roscore. It subscribes to the standard /rosout topic, the topic to which all nodes send log messages.

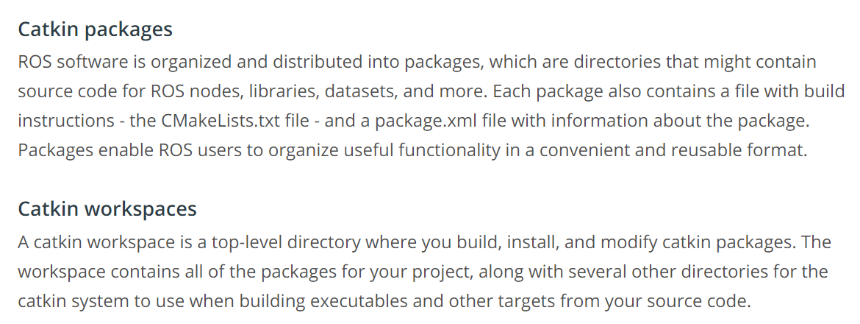
$rostopic list

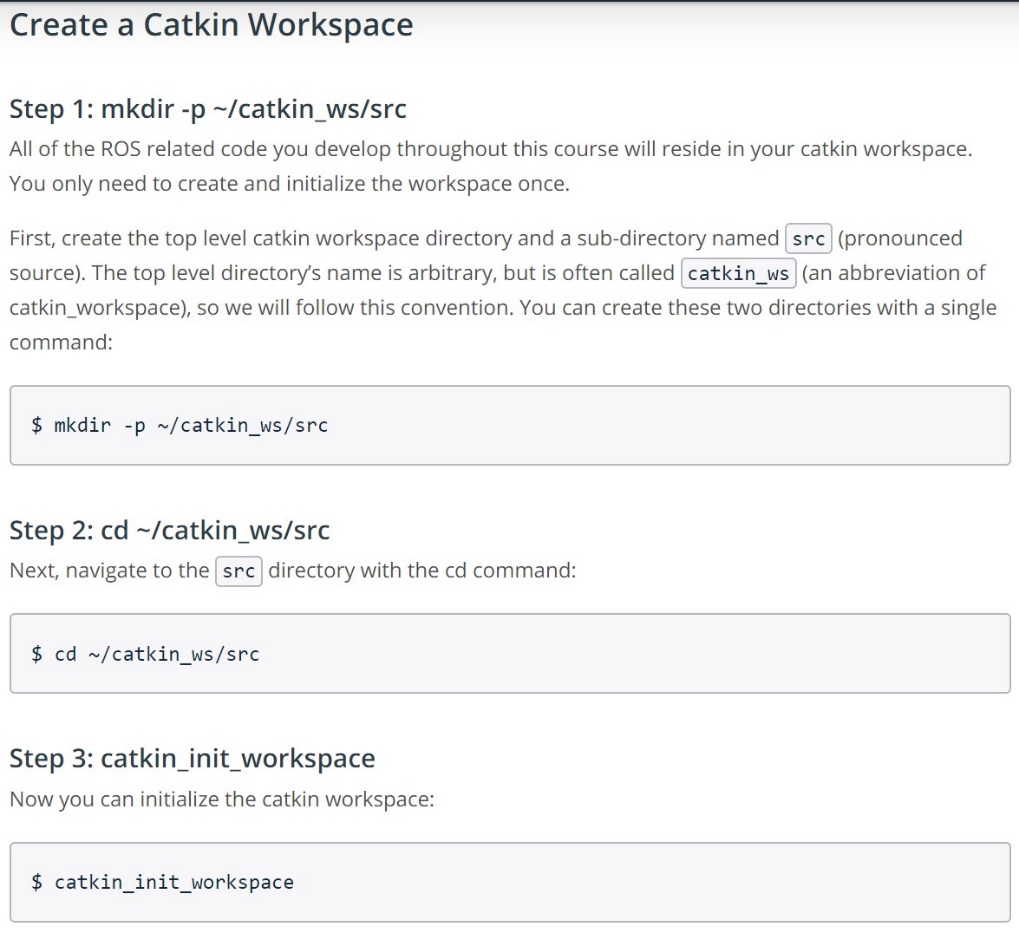
$ rostopic echo /turtle1/cmd\_vel

$rostopic info

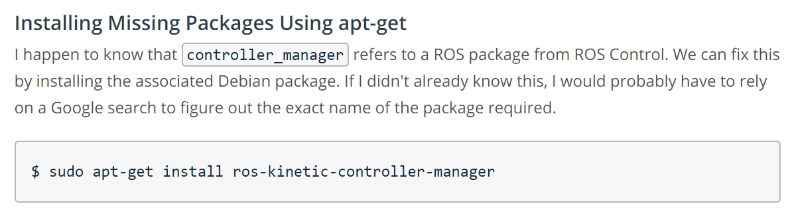
rosmsg show geometrymsgs/Twist

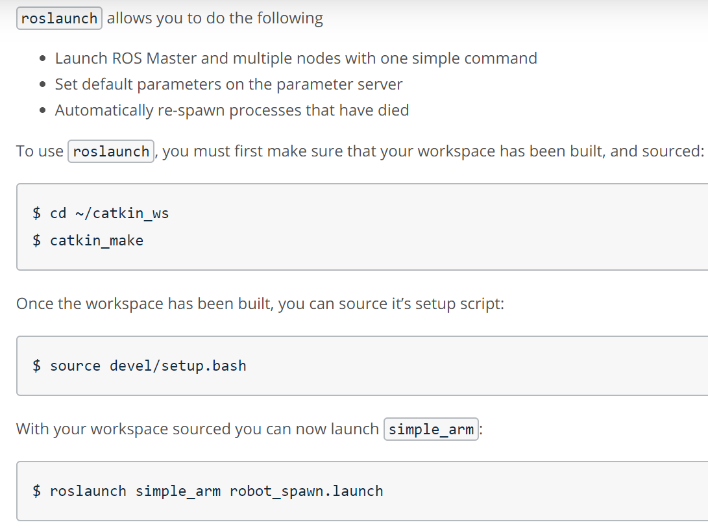
rosed geometry\_msgs Twist.msg 🡪 to get more info like dev comments

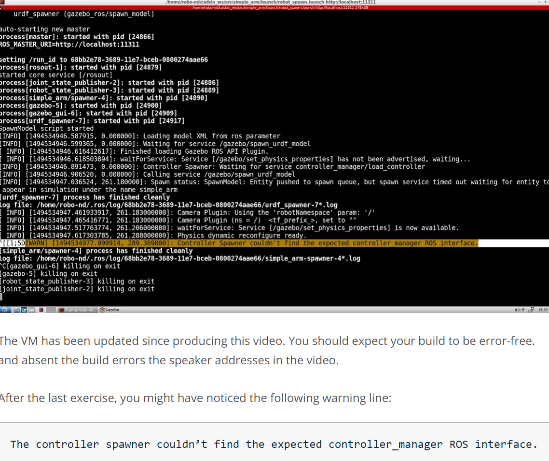


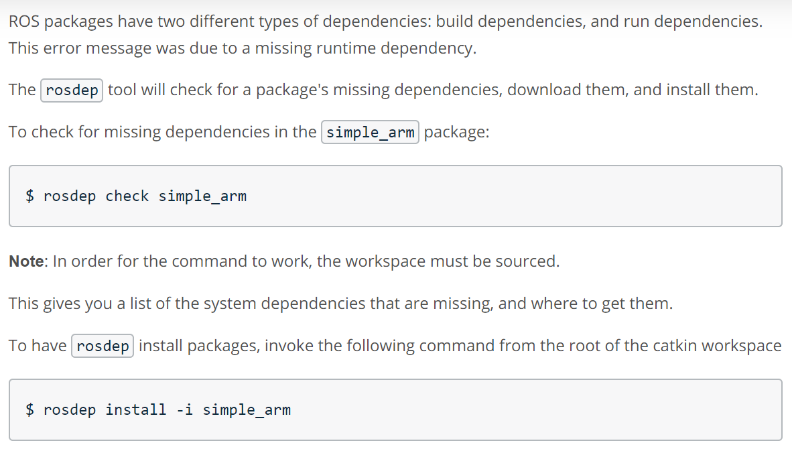


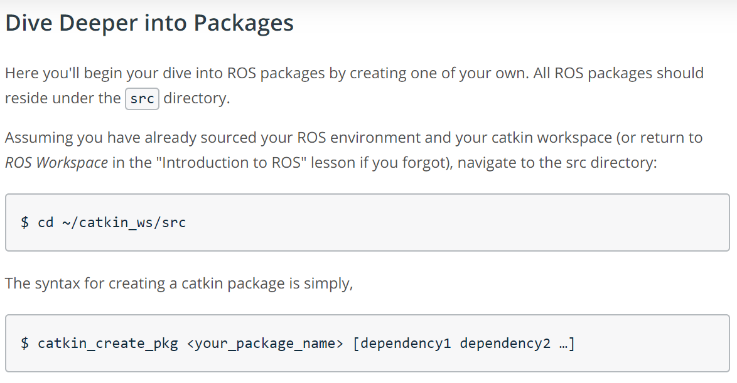


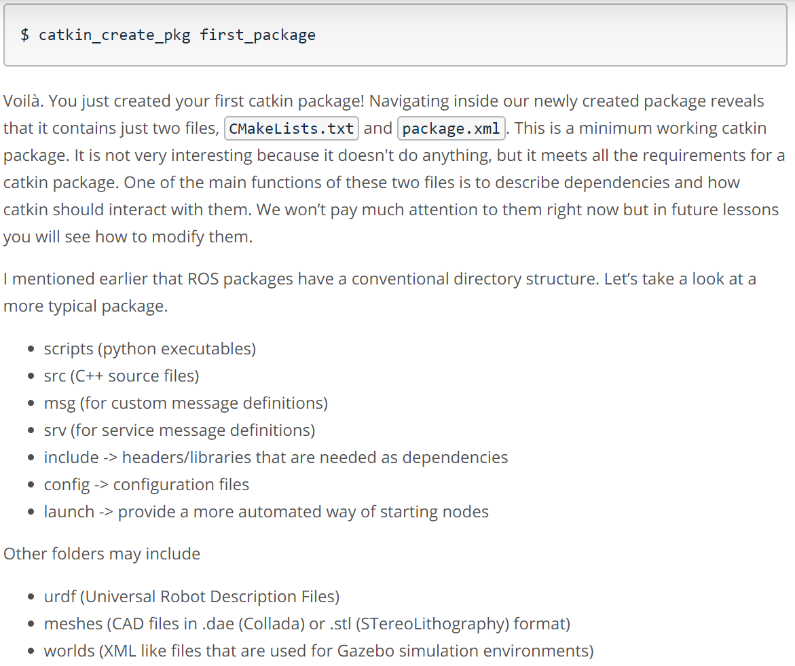


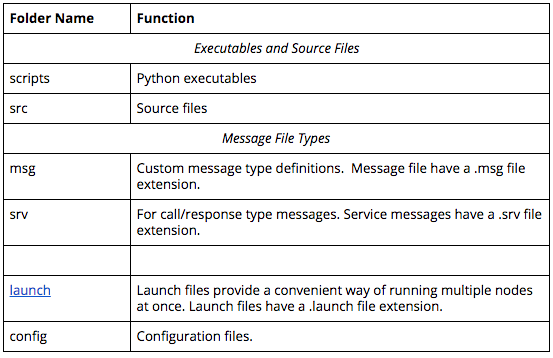


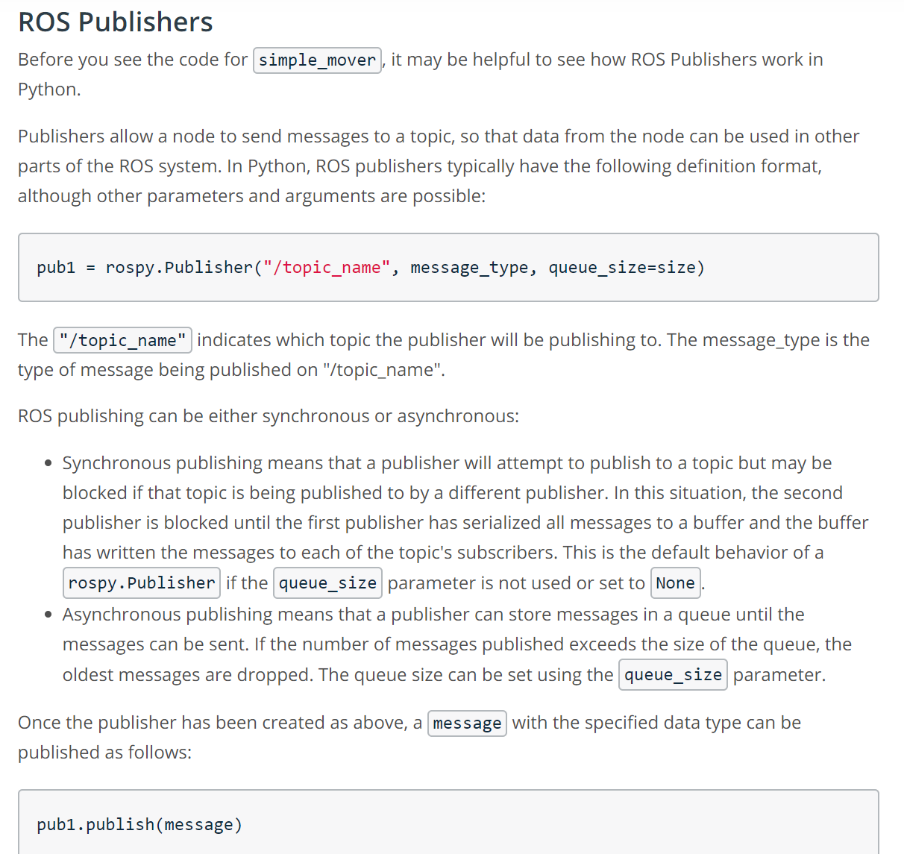


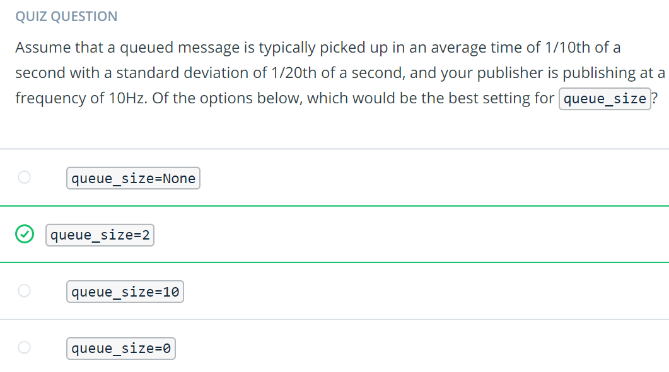




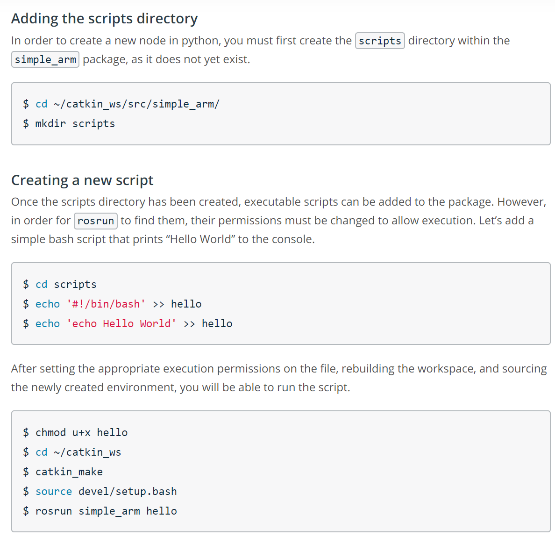


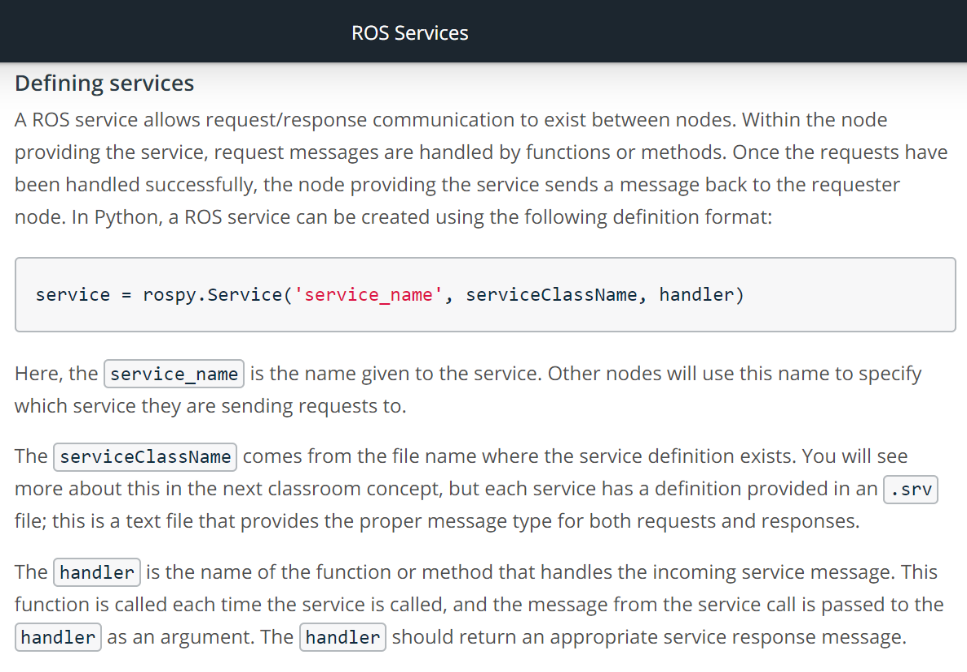




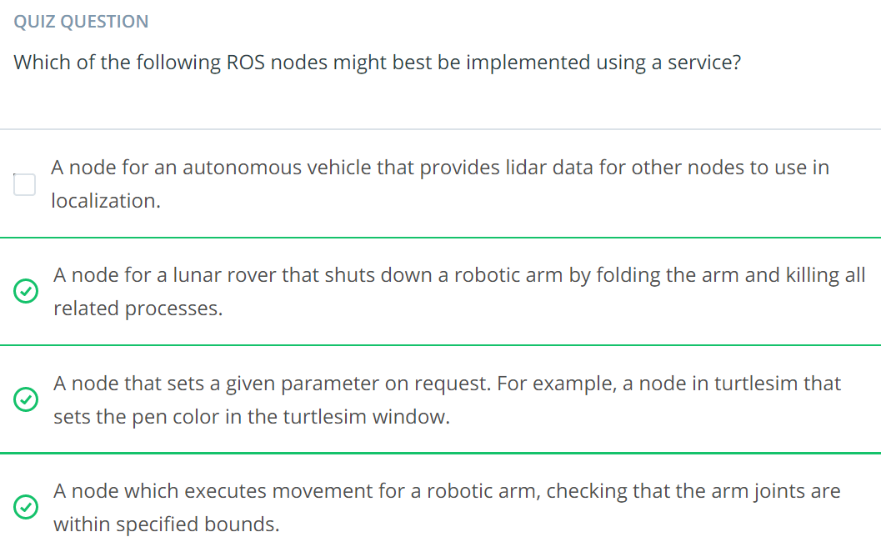


Choosing a good queue\_size is somewhat subjective, but since messages are picked up at roughly the same rate they are published, a queue\_size of 2 provides a little room for messages to queue without being too large.



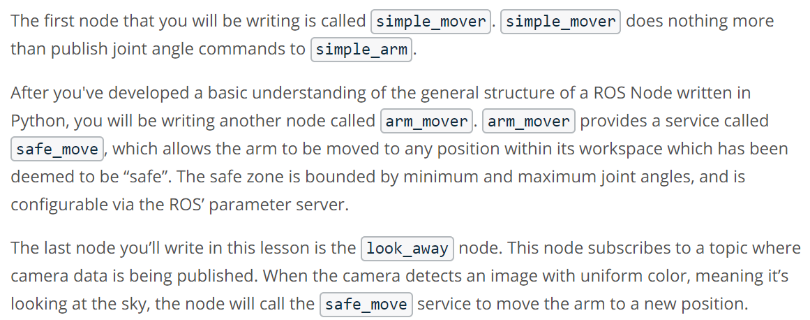




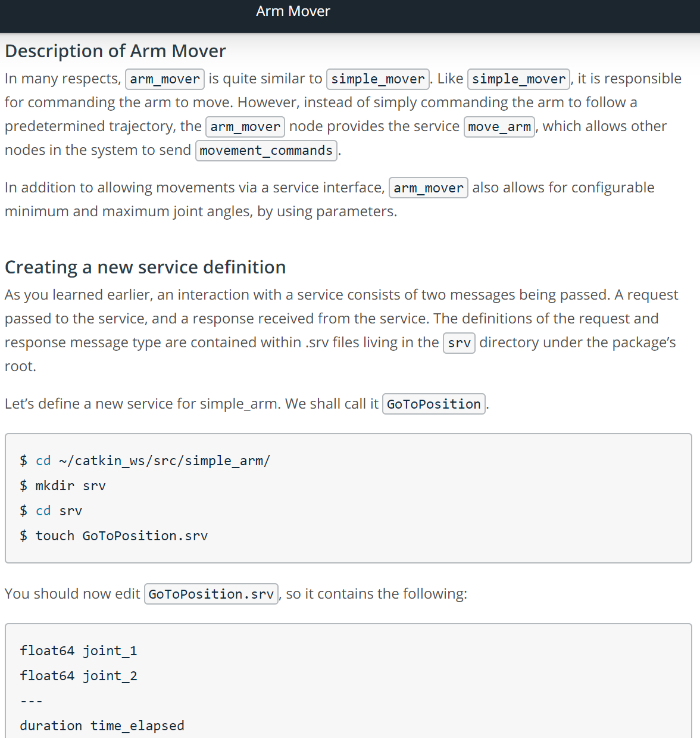


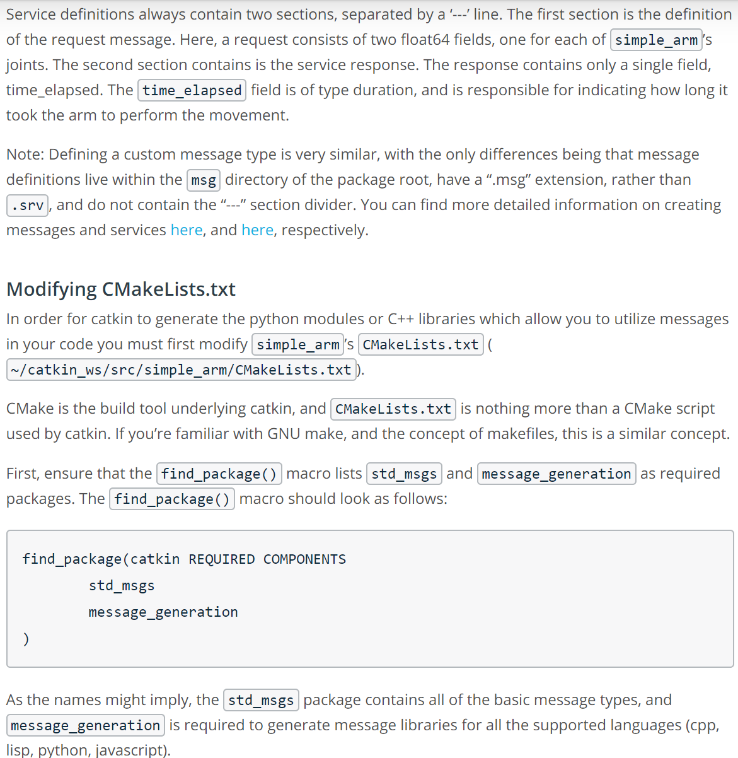
Each of these nodes would likely benefit from the request/response format of a ROS service.

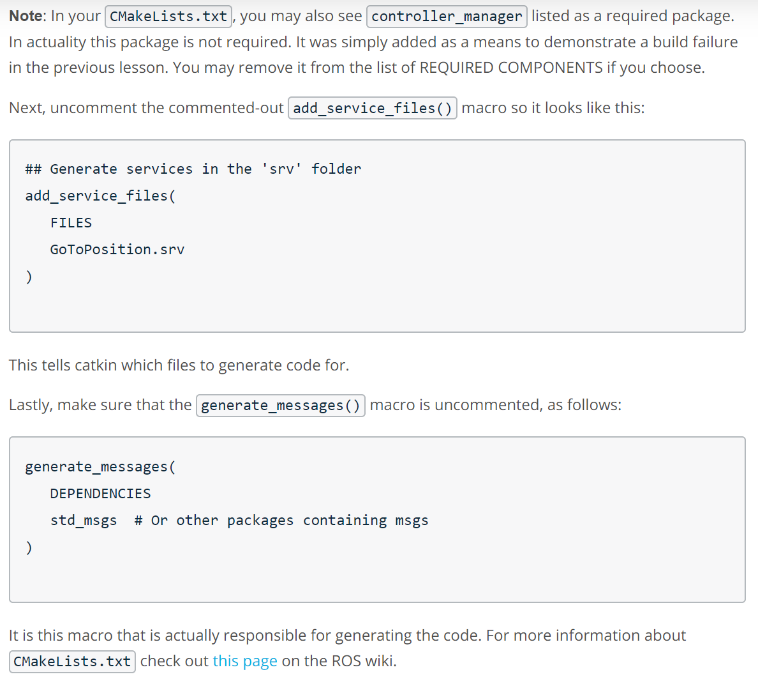
Practical case:

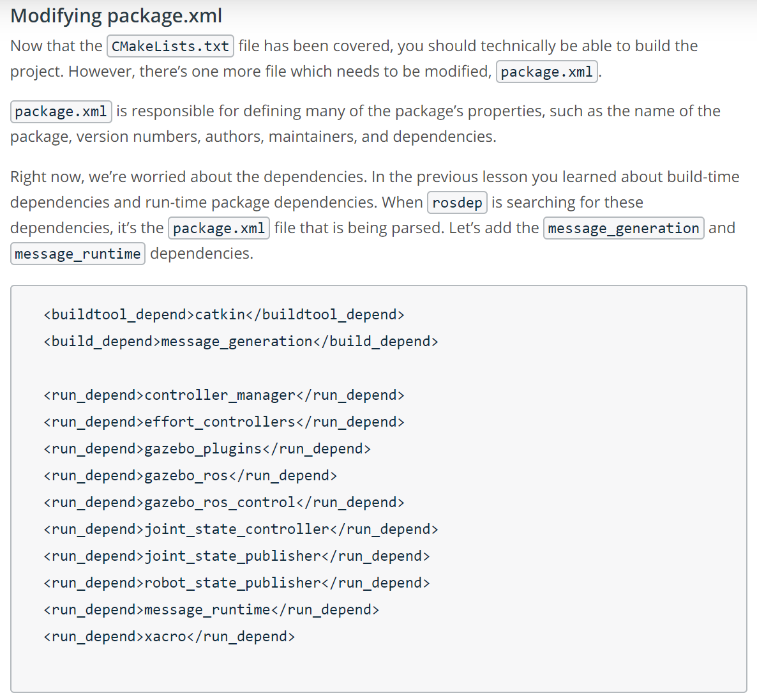


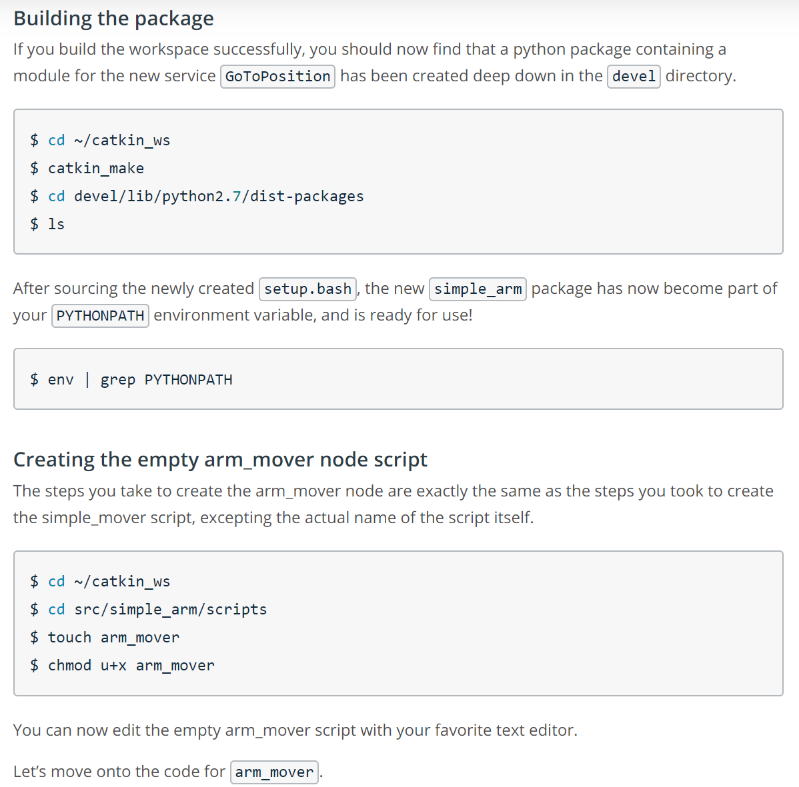






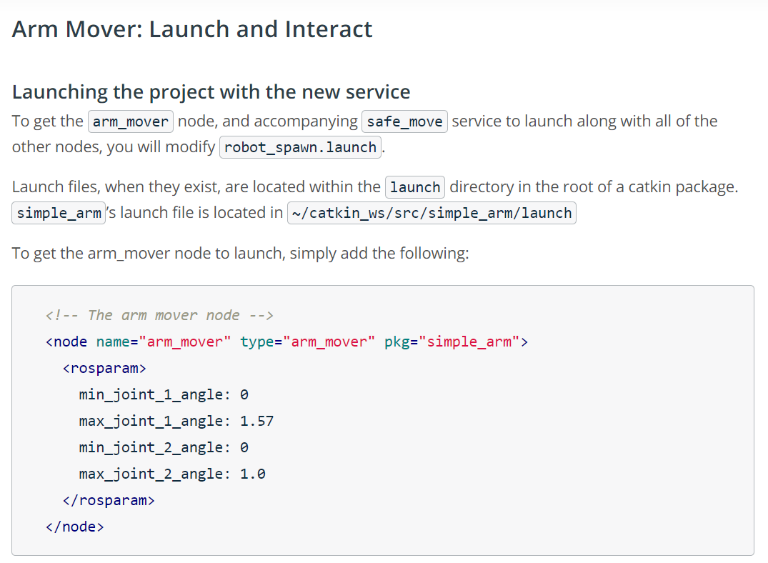


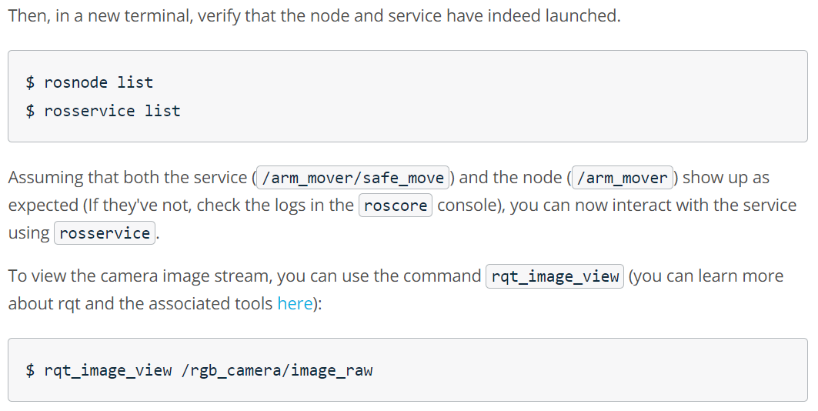




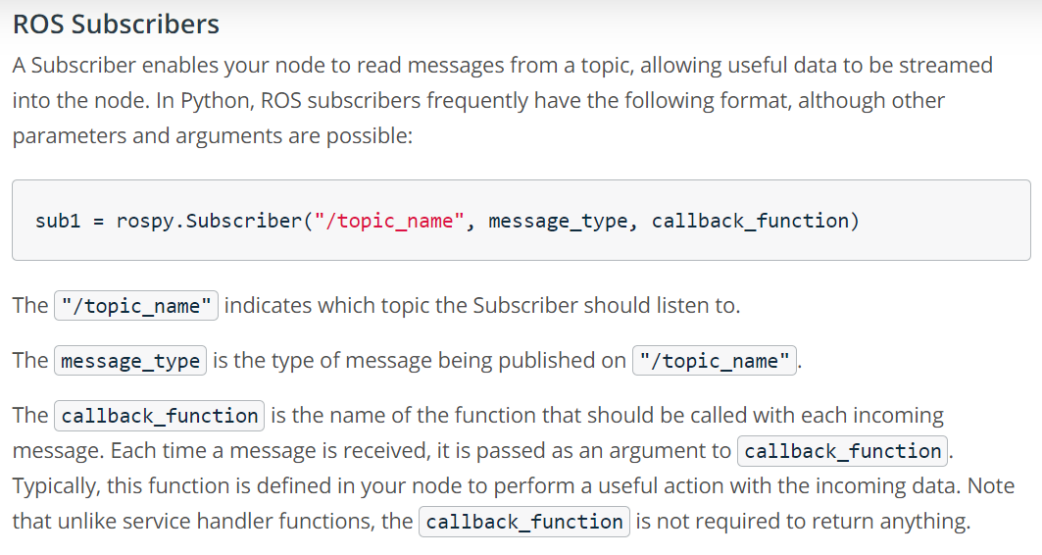


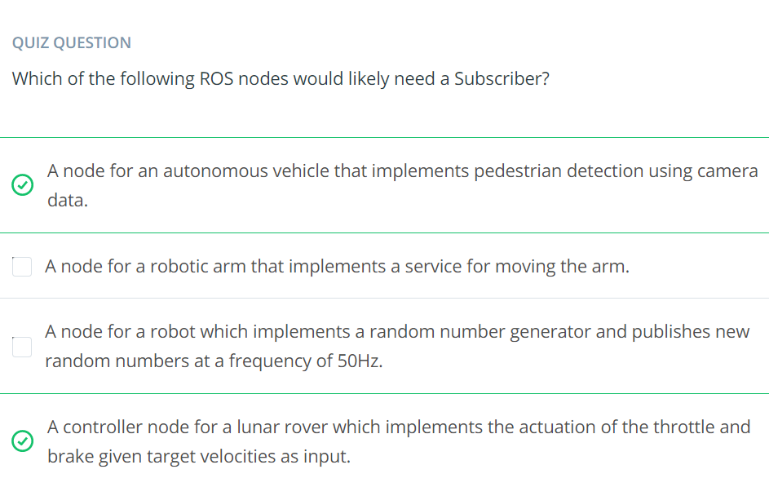












Any node that will require a steady stream of input data to accomplish a task will need a subscriber to get the data into the node.

