

2022 Fall - Self-Driving Cars

Assignment 1.2

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Part 1 - Subscriber & Publisher w/ ROS & C++

```
roscore http://jonathan:11311/

started roslaunch server http://jonathan:37303/
ros_comm version 1.15.14

SUMMARY
=====
PARAMETERS
* /roscore: noetic
* /rosversion: 1.15.14
NODES
auto-starting new master
process[master]: started with pid [63168]
ROS_MASTER_URI=http://jonathan:11311/

setting /run_id to e90dff1e-380f-11ed-850a-85805d228760
process[roscout-1]: started with pid [63193]
started core service [/roscout]

[ INFO] [1663587795.024877121]: I heard: [hello world 569]
[ INFO] [1663587795.124863915]: I heard: [hello world 570]
[ INFO] [1663587795.224931822]: I heard: [hello world 571]
[ INFO] [1663587795.324914648]: I heard: [hello world 572]
[ INFO] [1663587795.424940746]: I heard: [hello world 573]
[ INFO] [1663587795.524891092]: I heard: [hello world 574]
[ INFO] [1663587795.624847669]: I heard: [hello world 575]
[ INFO] [1663587795.724930864]: I heard: [hello world 576]
[ INFO] [1663587795.824883875]: I heard: [hello world 577]
[ INFO] [1663587795.924898251]: I heard: [hello world 578]
[ INFO] [1663587796.024871960]: I heard: [hello world 579]
[ INFO] [1663587796.124849586]: I heard: [hello world 580]
[ INFO] [1663587796.224861957]: I heard: [hello world 581]
[ INFO] [1663587796.324874429]: I heard: [hello world 582]
[ INFO] [1663587796.424884035]: I heard: [hello world 583]
[ INFO] [1663587796.524900765]: I heard: [hello world 584]
[ INFO] [1663587796.624923146]: I heard: [hello world 585]
[ INFO] [1663587796.724839146]: I heard: [hello world 586]
[ INFO] [1663587796.824901401]: I heard: [hello world 587]
[ INFO] [1663587796.925091638]: I heard: [hello world 588]
[ INFO] [1663587797.024931254]: I heard: [hello world 589]
[ INFO] [1663587797.124903639]: I heard: [hello world 590]
[ INFO] [1663587797.224964511]: I heard: [hello world 591]
[ INFO] [1663587797.324921919]: I heard: [hello world 592]
[ INFO] [1663587797.424889696]: I heard: [hello world 593]
[ INFO] [1663587797.524884844]: I heard: [hello world 594]
[ INFO] [1663587797.624886104]: I heard: [hello world 595]
[ INFO] [1663587797.724653333]: I heard: [hello world 596]
[ INFO] [1663587797.824666826]: I heard: [hello world 597]
[ INFO] [1663587797.924649000]: I heard: [hello world 598]
[ INFO] [1663587798.024653356]: I heard: [hello world 599]
[ INFO] [1663587798.124651860]: I heard: [hello world 600]
[ INFO] [1663587798.224657046]: I heard: [hello world 601]
[ INFO] [1663587798.324654028]: I heard: [hello world 602]
[ INFO] [1663587798.424655748]: I heard: [hello world 603]
[ INFO] [1663587798.524650265]: I heard: [hello world 604]
[ INFO] [1663587798.624651925]: I heard: [hello world 605]
[ INFO] [1663587798.724660578]: I heard: [hello world 606]
[ INFO] [1663587798.824656417]: I heard: [hello world 607]
[ INFO] [1663587798.924647868]: I heard: [hello world 608]
[ INFO] [1663587799.024674555]: I heard: [hello world 609]
[ INFO] [1663587799.124658311]: I heard: [hello world 610]
[ INFO] [1663587799.224663006]: I heard: [hello world 611]
[ INFO] [1663587799.324667571]: I heard: [hello world 612]
[ INFO] [1663587799.424656817]: I heard: [hello world 613]
[ INFO] [1663587799.524656012]: I heard: [hello world 614]
[ INFO] [1663587799.624653073]: I heard: [hello world 615]
[ INFO] [1663587799.724654972]: I heard: [hello world 616]
```

Part 1 - Subscriber & Publisher w/ ROS & Python

```
roscore http://jonathan:11311/

4981.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://jonathan:36225/
ros_comm version 1.15.14

SUMMARY
=====
PARAMETERS
* /roscdistro: noetic
* /rosversion: 1.15.14

NODES

auto-starting new master
process[master]: started with pid [65004]
ROS_MASTER_URI=http://jonathan:11311/

setting /run_id to d19db868-3811-11ed-850a-85805d228760
process[roscout-1]: started with pid [65029]
started core service [/roscout]

jonathan@jonathan: ~/catkin_ws

[INFO] [1663588566.334001]: /listener_65198_1663588522329I heard hello world 1663588563.3322842
[INFO] [1663588563.434799]: /listener_65198_1663588522329I heard hello world 1663588563.4323082
[INFO] [1663588563.534544]: /listener_65198_1663588522329I heard hello world 1663588563.5323074
[INFO] [1663588563.634602]: /listener_65198_1663588522329I heard hello world 1663588563.632351
[INFO] [1663588563.735034]: /listener_65198_1663588522329I heard hello world 1663588563.7323189
[INFO] [1663588563.834625]: /listener_65198_1663588522329I heard hello world 1663588563.83235
[INFO] [1663588563.934141]: /listener_65198_1663588522329I heard hello world 1663588563.9322968
[INFO] [1663588564.033984]: /listener_65198_1663588522329I heard hello world 1663588564.0322888
[INFO] [1663588564.133752]: /listener_65198_1663588522329I heard hello world 1663588564.1322806
[INFO] [1663588564.234141]: /listener_65198_1663588522329I heard hello world 1663588564.2322874
[INFO] [1663588564.333986]: /listener_65198_1663588522329I heard hello world 1663588564.3322818
[INFO] [1663588564.433770]: /listener_65198_1663588522329I heard hello world 1663588564.4322813
[INFO] [1663588564.534025]: /listener_65198_1663588522329I heard hello world 1663588564.5322847
[INFO] [1663588564.633977]: /listener_65198_1663588522329I heard hello world 1663588564.6322856
[INFO] [1663588564.733997]: /listener_65198_1663588522329I heard hello world 1663588564.7322893
[INFO] [1663588564.833996]: /listener_65198_1663588522329I heard hello world 1663588564.832282
[INFO] [1663588564.934142]: /listener_65198_1663588522329I heard hello world 1663588564.9322917
[INFO] [1663588565.034079]: /listener_65198_1663588522329I heard hello world 1663588565.0323005
[INFO] [1663588565.134557]: /listener_65198_1663588522329I heard hello world 1663588565.1323223
[INFO] [1663588565.234227]: /listener_65198_1663588522329I heard hello world 1663588565.2323062
[INFO] [1663588565.334091]: /listener_65198_1663588522329I heard hello world 1663588565.3323447
[INFO] [1663588565.434443]: /listener_65198_1663588522329I heard hello world 1663588565.4323118
[INFO] [1663588565.534100]: /listener_65198_1663588522329I heard hello world 1663588565.5322938
[INFO] [1663588565.634074]: /listener_65198_1663588522329I heard hello world 1663588565.6322982
[INFO] [1663588565.734002]: /listener_65198_1663588522329I heard hello world 1663588565.7322986
[INFO] [1663588565.834110]: /listener_65198_1663588522329I heard hello world 1663588565.8322868
[INFO] [1663588565.933683]: /listener_65198_1663588522329I heard hello world 1663588565.9322767
[INFO] [1663588566.033960]: /listener_65198_1663588522329I heard hello world 1663588566.0322783
[INFO] [1663588566.133976]: /listener_65198_1663588522329I heard hello world 1663588566.1323278
[INFO] [1663588566.234038]: /listener_65198_1663588522329I heard hello world 1663588566.2323008
[INFO] [1663588566.334059]: /listener_65198_1663588522329I heard hello world 1663588566.3322978
[INFO] [1663588566.434046]: /listener_65198_1663588522329I heard hello world 1663588566.4322934
[INFO] [1663588566.534358]: /listener_65198_1663588522329I heard hello world 1663588566.5323277
[INFO] [1663588566.634307]: /listener_65198_1663588522329I heard hello world 1663588566.6323082
[INFO] [1663588566.734300]: /listener_65198_1663588522329I heard hello world 1663588566.7323203
[INFO] [1663588566.833847]: /listener_65198_1663588522329I heard hello world 1663588566.8322701
[INFO] [1663588566.932444]: /listener_65198_1663588522329I heard hello world 1663588566.9322875
[INFO] [1663588567.032419]: /listener_65198_1663588522329I heard hello world 1663588567.0322835
[INFO] [1663588567.132445]: /listener_65198_1663588522329I heard hello world 1663588567.132288
[INFO] [1663588567.232474]: /listener_65198_1663588522329I heard hello world 1663588567.2323077
[INFO] [1663588567.332511]: /listener_65198_1663588522329I heard hello world 1663588567.332352
[INFO] [1663588567.432462]: /listener_65198_1663588522329I heard hello world 1663588567.432289
[INFO] [1663588567.532463]: /listener_65198_1663588522329I heard hello world 1663588567.532288
[INFO] [1663588567.632572]: /listener_65198_1663588522329I heard hello world 1663588567.6324024
[INFO] [1663588567.732507]: /listener_65198_1663588522329I heard hello world 1663588567.732316
[INFO] [1663588567.832496]: /listener_65198_1663588522329I heard hello world 1663588567.8323133
[INFO] [1663588567.932449]: /listener_65198_1663588522329I heard hello world 1663588567.9322963
[INFO] [1663588568.032460]: /listener_65198_1663588522329I heard hello world 1663588568.0322986
[INFO] [1663588568.132452]: /listener_65198_1663588522329I heard hello world 1663588568.1322942
[INFO] [1663588568.232442]: /listener_65198_1663588522329I heard hello world 1663588568.2322905
[INFO] [1663588568.332462]: /listener_65198_1663588522329I heard hello world 1663588568.332288
```

Part 2 - Subscriber & Publisher w/ ROS2 & C++

```
Jonathan@Jonathan: ~/ros2_ws
[INFO] [1663592442.588131312] [minimal_publisher]: Publishing: 'Hello, world! 108'
[INFO] [1663592443.088169729] [minimal_publisher]: Publishing: 'Hello, world! 109'
[INFO] [1663592443.588138296] [minimal_publisher]: Publishing: 'Hello, world! 110'
[INFO] [1663592444.088136548] [minimal_publisher]: Publishing: 'Hello, world! 111'
[INFO] [1663592444.588133679] [minimal_publisher]: Publishing: 'Hello, world! 112'
[INFO] [1663592445.088173471] [minimal_publisher]: Publishing: 'Hello, world! 113'
[INFO] [1663592445.588135576] [minimal_publisher]: Publishing: 'Hello, world! 114'
[INFO] [1663592446.088234309] [minimal_publisher]: Publishing: 'Hello, world! 115'
[INFO] [1663592446.588149196] [minimal_publisher]: Publishing: 'Hello, world! 116'
[INFO] [1663592447.088211380] [minimal_publisher]: Publishing: 'Hello, world! 117'
[INFO] [1663592447.588152497] [minimal_publisher]: Publishing: 'Hello, world! 118'
[INFO] [1663592448.088159829] [minimal_publisher]: Publishing: 'Hello, world! 119'
[INFO] [1663592448.588185707] [minimal_publisher]: Publishing: 'Hello, world! 120'
[INFO] [1663592449.088143305] [minimal_publisher]: Publishing: 'Hello, world! 121'
[INFO] [1663592449.588165235] [minimal_publisher]: Publishing: 'Hello, world! 122'
[INFO] [1663592450.088170344] [minimal_publisher]: Publishing: 'Hello, world! 123'
[INFO] [1663592450.588165815] [minimal_publisher]: Publishing: 'Hello, world! 124'
[INFO] [1663592451.088161186] [minimal_publisher]: Publishing: 'Hello, world! 125'
[INFO] [1663592451.588178418] [minimal_publisher]: Publishing: 'Hello, world! 126'
[INFO] [1663592452.088184339] [minimal_publisher]: Publishing: 'Hello, world! 127'
[INFO] [1663592452.588180923] [minimal_publisher]: Publishing: 'Hello, world! 128'
[INFO] [1663592453.088172067] [minimal_publisher]: Publishing: 'Hello, world! 129'
[INFO] [1663592453.588179011] [minimal_publisher]: Publishing: 'Hello, world! 130'

Jonathan@Jonathan: ~/ros2_ws
[INFO] [1663592442.588436846] [minimal_subscriber]: I heard: 'Hello, world! 108'
[INFO] [1663592443.088557558] [minimal_subscriber]: I heard: 'Hello, world! 109'
[INFO] [1663592443.588460602] [minimal_subscriber]: I heard: 'Hello, world! 110'
[INFO] [1663592444.088476597] [minimal_subscriber]: I heard: 'Hello, world! 111'
[INFO] [1663592444.588453370] [minimal_subscriber]: I heard: 'Hello, world! 112'
[INFO] [1663592445.088554387] [minimal_subscriber]: I heard: 'Hello, world! 113'
[INFO] [1663592445.588437574] [minimal_subscriber]: I heard: 'Hello, world! 114'
[INFO] [1663592446.088948301] [minimal_subscriber]: I heard: 'Hello, world! 115'
[INFO] [1663592446.588465500] [minimal_subscriber]: I heard: 'Hello, world! 116'
[INFO] [1663592447.088716590] [minimal_subscriber]: I heard: 'Hello, world! 117'
[INFO] [1663592447.588493819] [minimal_subscriber]: I heard: 'Hello, world! 118'
[INFO] [1663592448.088531357] [minimal_subscriber]: I heard: 'Hello, world! 119'
[INFO] [1663592448.588563447] [minimal_subscriber]: I heard: 'Hello, world! 120'
[INFO] [1663592449.088498723] [minimal_subscriber]: I heard: 'Hello, world! 121'
[INFO] [1663592449.588513680] [minimal_subscriber]: I heard: 'Hello, world! 122'
[INFO] [1663592450.088556089] [minimal_subscriber]: I heard: 'Hello, world! 123'
[INFO] [1663592450.588483121] [minimal_subscriber]: I heard: 'Hello, world! 124'
[INFO] [1663592451.088507817] [minimal_subscriber]: I heard: 'Hello, world! 125'
[INFO] [1663592451.588511844] [minimal_subscriber]: I heard: 'Hello, world! 126'
[INFO] [1663592452.088545608] [minimal_subscriber]: I heard: 'Hello, world! 127'
[INFO] [1663592452.588528316] [minimal_subscriber]: I heard: 'Hello, world! 128'
[INFO] [1663592453.088508489] [minimal_subscriber]: I heard: 'Hello, world! 129'
[INFO] [1663592453.588509342] [minimal_subscriber]: I heard: 'Hello, world! 130'
```


Part 2 - Subscriber & Publisher w/ ROS2 & Python

```
jonathan@jonathan: ~/ros2_ws
[INFO] [1663593240.058652759] [minimal_publisher]: Publishing: "Hello World: 46"
[INFO] [1663593240.558848272] [minimal_publisher]: Publishing: "Hello World: 47"
[INFO] [1663593241.058347952] [minimal_publisher]: Publishing: "Hello World: 48"
[INFO] [1663593241.558553858] [minimal_publisher]: Publishing: "Hello World: 49"
[INFO] [1663593242.058555604] [minimal_publisher]: Publishing: "Hello World: 50"
[INFO] [1663593242.558496611] [minimal_publisher]: Publishing: "Hello World: 51"
[INFO] [1663593243.058352135] [minimal_publisher]: Publishing: "Hello World: 52"
[INFO] [1663593243.558706310] [minimal_publisher]: Publishing: "Hello World: 53"
[INFO] [1663593244.058125468] [minimal_publisher]: Publishing: "Hello World: 54"
[INFO] [1663593244.558473616] [minimal_publisher]: Publishing: "Hello World: 55"
[INFO] [1663593245.058934408] [minimal_publisher]: Publishing: "Hello World: 56"
[INFO] [1663593245.558694974] [minimal_publisher]: Publishing: "Hello World: 57"
[INFO] [1663593246.058492167] [minimal_publisher]: Publishing: "Hello World: 58"
[INFO] [1663593246.558481903] [minimal_publisher]: Publishing: "Hello World: 59"
[INFO] [1663593247.058625208] [minimal_publisher]: Publishing: "Hello World: 60"
[INFO] [1663593247.558474321] [minimal_publisher]: Publishing: "Hello World: 61"
[INFO] [1663593248.058385869] [minimal_publisher]: Publishing: "Hello World: 62"
[INFO] [1663593248.558607924] [minimal_publisher]: Publishing: "Hello World: 63"
[INFO] [1663593249.058319026] [minimal_publisher]: Publishing: "Hello World: 64"
[INFO] [1663593249.558475681] [minimal_publisher]: Publishing: "Hello World: 65"
[INFO] [1663593250.058644206] [minimal_publisher]: Publishing: "Hello World: 66"
[INFO] [1663593250.558505784] [minimal_publisher]: Publishing: "Hello World: 67"
[INFO] [1663593251.058468193] [minimal_publisher]: Publishing: "Hello World: 68"

jonathan@jonathan: ~/ros2_ws
[INFO] [1663593240.059216080] [minimal_subscriber]: I heard: "Hello World: 46"
[INFO] [1663593240.559189781] [minimal_subscriber]: I heard: "Hello World: 47"
[INFO] [1663593241.058614067] [minimal_subscriber]: I heard: "Hello World: 48"
[INFO] [1663593241.558680338] [minimal_subscriber]: I heard: "Hello World: 49"
[INFO] [1663593242.058901451] [minimal_subscriber]: I heard: "Hello World: 50"
[INFO] [1663593242.558838631] [minimal_subscriber]: I heard: "Hello World: 51"
[INFO] [1663593243.058684937] [minimal_subscriber]: I heard: "Hello World: 52"
[INFO] [1663593243.558727009] [minimal_subscriber]: I heard: "Hello World: 53"
[INFO] [1663593244.058766756] [minimal_subscriber]: I heard: "Hello World: 54"
[INFO] [1663593244.558402341] [minimal_subscriber]: I heard: "Hello World: 55"
[INFO] [1663593245.058885665] [minimal_subscriber]: I heard: "Hello World: 56"
[INFO] [1663593245.558867121] [minimal_subscriber]: I heard: "Hello World: 57"
[INFO] [1663593246.058806264] [minimal_subscriber]: I heard: "Hello World: 58"
[INFO] [1663593246.558702943] [minimal_subscriber]: I heard: "Hello World: 59"
[INFO] [1663593247.058995121] [minimal_subscriber]: I heard: "Hello World: 60"
[INFO] [1663593247.559048812] [minimal_subscriber]: I heard: "Hello World: 61"
[INFO] [1663593248.058739391] [minimal_subscriber]: I heard: "Hello World: 62"
[INFO] [1663593248.558946016] [minimal_subscriber]: I heard: "Hello World: 63"
[INFO] [1663593249.058928223] [minimal_subscriber]: I heard: "Hello World: 64"
[INFO] [1663593249.558748289] [minimal_subscriber]: I heard: "Hello World: 65"
[INFO] [1663593250.059022034] [minimal_subscriber]: I heard: "Hello World: 66"
[INFO] [1663593250.558857533] [minimal_subscriber]: I heard: "Hello World: 67"
[INFO] [1663593251.058807898] [minimal_subscriber]: I heard: "Hello World: 68"
```