

Assignment #2

11/10/2020

[ROS Package, Node, Topic Project]

1. 하나의 node에서 2개이상의 토픽 subscribe하기

노드는 다음과 같이 구성한다.

- 1번 node : 1과 10 사이의 랜덤한 값을 A로 publish
- 2번 node : 11과 20 사이의 랜덤한 값을 B로 publish
- 3번 node : A와 B를 subscribe한 후, A+B를 연산하여 C로 publish
- 4번 node : C subscribe 누적 평균 출력

* 참고 (아래 코드와 데이터 타입을 참고하여 구현)

```
// Int64 msg 헤더 include
#include "std_msgs/Int64.h"
// CALLBACK 함수
void chatterCallback(const std_msgs::Int64::ConstPtr& msg)
// PUBLISHER
chatter_pub = n.advertise<std_msgs::Int64>("토픽이름", 1000);
// data 접근
msg->data;
```

```
/* rand example: guess the number */
#include <stdio.h> /* printf, scanf, puts, NULL */
#include <stdlib.h> /* srand, rand */
#include <time.h> /* time */

int main ()
{
    int iSecret, iGuess;
```

```

/* initialize random seed: */
srand (time(NULL));

/* generate secret number between 1 and 10: */
iSecret = rand() % 10 + 1;

do {
    printf ("Guess the number (1 to 10): ");
    scanf ("%d",&iGuess);
    if (iSecret<iGuess) puts ("The secret number is lower");
    else if (iSecret>iGuess) puts ("The secret number is higher");
} while (iSecret!=iGuess);

puts ("Congratulations!");
return 0;
}

```

Primitive Type	Serialization	C++	Python2	Python3
bool (1)	unsigned 8-bit int	uint8_t (2)		bool
int8	signed 8-bit int	int8_t		int
uint8	unsigned 8-bit int	uint8_t		int (3)
int16	signed 16-bit int	int16_t		int
uint16	unsigned 16-bit int	uint16_t		int
int32	signed 32-bit int	int32_t		int
uint32	unsigned 32-bit int	uint32_t		int
int64	signed 64-bit int	int64_t	long	int
uint64	unsigned 64-bit int	uint64_t	long	int
float32	32-bit IEEE float	float		float
float64	64-bit IEEE float	double		float
string	ascii string (4)	std::string	str	bytes

위의 실습 프로젝트에 대해 프로그램 구성, 실행 결과를 중심으로 프로젝트 레포트를 형식에 맞춰 작성하여 제출 바랍니다.

소스 코드는 레포트 마지막에 별첨으로 첨부하기 바랍니다.

제출일: 2020년 11월 18일(수) 오후 6시 이전

제출 방법: 이메일 제출 (gwkim@cbnu.ac.kr)

```

kjj@kjj-500R5M-500R5M-501R5M:~$ cd test_ws
kjj@kjj-500R5M-500R5M-501R5M:~/test_ws$ catkin_make
Base path: /home/kjj/test_ws
Source space: /home/kjj/test_ws/src
Build space: /home/kjj/test_ws/build
Devel space: /home/kjj/test_ws/devel
Install space: /home/kjj/test_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/kjj/test_ws/build"
####
####
#### Running command: "make -j4 -l4" in "/home/kjj/test_ws/build"
####
Scanning dependencies of target jungjaenode
[ 50%] Building CXX object testpkg/CMakeFiles/jungjaenode.dir/src/jungjae.cpp.o
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\355' in program
    chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\206' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\240' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\355' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\224' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\275' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\354' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\235' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\264' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\353' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\246' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\204' in program
In file included from /opt/ros/kinetic/include/ros/ros.h:40:0,
                 from /home/kjj/test_ws/src/testpkg/src/jungjae.cpp:1:
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: In function 'void chatterCallback(const ConstPtr&)':
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:6:37: error: request for member 'c_str' in '(& msg)->boost::shared_ptr<T>::operator-><const std_msgs::Int64_<std::allocator<void> > >()->std_msgs::Int64_<std::allocator<void> >::data', which is of non-class type 'const _data_type {aka const long int}'
    ROS_INFO("I heard: [%s]", msg->data.c_str());
                                     ^
/opt/ros/kinetic/include/ros/console.h:346:165: note: in definition of macro 'ROSCONSOLE_PRINT_AT_LOCATION_WITH_FILTER'
    __location__loc.level__, __FILE__, __LINE__, __ROSCONSOLE_FUNCTION__, __VA_ARGS__
                                                                                                                                              ^
/opt/ros/kinetic/include/ros/console.h:379:7: note: in expansion of macro 'ROSCONSOLE_PRINT_AT_LOCATION'
    ROSCONSOLE_PRINT_AT_LOCATION(__VA_ARGS__); \
    ^
/opt/ros/kinetic/include/ros/console.h:561:35: note: in expansion of macro 'ROS_LOG_COND'
    #define ROS_LOG(level, name, ...) ROS_LOG_COND(true, level, name, __VA_ARGS__)
                                     ^
/opt/ros/kinetic/include/rosconsole/macros_generated.h:110:23: note: in expansion of macro 'ROS_LOG'
    #define ROS_INFO(...) ROS_LOG(::ros::console::levels::Info, ROSCONSOLE_DEFAULT_
    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:6:1: note: in expansion of macro 'ROS_INFO'
    ROS_INFO("I heard: [%s]", msg->data.c_str());
    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: At global scope:
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:9:1: error: 'msg' does not name a type
    msg->data;
    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: In function 'int main()':
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: 'chatter_pub' was not declared in this scope
    chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:17: error: 'n' was not declared in this scope
    chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
    ^

```

```

/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\354' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\235' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\264' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\353' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\246' in program
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: stray '\204' in program
In file included from /opt/ros/kinetic/include/ros/ros.h:40:0,
                 from /home/kjj/test_ws/src/testpkg/src/jungjae.cpp:1:
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: In function 'void chatterCallback(const ConstPtr&)':
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:6:37: error: request for member 'c_str' in '(& msg)->boost::shared_ptr<T>::operator-><const std_msgs::Int64<std::allocator<void> > >()->std_msgs::Int64<std::allocator<void> >::data', which is of non-class type 'const _data_type {aka const long int}'
ROS_INFO("I heard: [%s]", msg->data.c_str());

/opt/ros/kinetic/include/ros/console.h:346:165: note: in definition of macro 'ROSCONSOLE_PRINT_AT_LOCATION_WITH_FILTER'
_location__loc.level__, __FILE__, __LINE__, __ROSCONSOLE_FUNCTION__, __VA_ARGS__
                                                                    ^
/opt/ros/kinetic/include/ros/console.h:379:7: note: in expansion of macro 'ROSCONSOLE_PRINT_AT_LOCATION'
ROSCONSOLE_PRINT_AT_LOCATION(__VA_ARGS__); \
                                                                    ^
/opt/ros/kinetic/include/ros/console.h:561:35: note: in expansion of macro 'ROS_LOG_COND'
#define ROS_LOG(level, name, ...) ROS_LOG_COND(true, level, name, __VA_ARGS__)
                                              ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:6:1: note: in expansion of macro 'ROS_INFO'
#define ROS_INFO(...) ROS_LOG(::ros::console::levels::Info, ROSCONSOLE_DEFAULT_
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:6:1: note: in expansion of macro 'ROS_INFO'
ROS_INFO("I heard: [%s]", msg->data.c_str());
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: At global scope:
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:9:1: error: 'msg' does not name a type
msg->data;
^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp: In function 'int main()':
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:3: error: 'chatter_pub' was not declared in this scope
chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:17: error: 'n' was not declared in this scope
chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:44: error: expected primary-expression before '>' token
chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:18:58: error: expected primary-expression before ',' token
chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
                                                                    ^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:25:4: error: 'iSecret' was not declared in this scope
iSecret = rand() % 10 + 1;
^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:29:18: error: 'iGuess' was not declared in this scope
scanf ("%d", &iGuess);
^
/home/kjj/test_ws/src/testpkg/src/jungjae.cpp:32:22: error: 'iGuess' was not declared in this scope
} while (iSecret!=iGuess);
^
testpkg/CMakeFiles/jungjaenode.dir/build.make:62: 'testpkg/CMakeFiles/jungjaenode.dir/src/jungjae.cpp.o' 타겟에 대한 명령이 실패했습니다
make[2]: *** [testpkg/CMakeFiles/jungjaenode.dir/src/jungjae.cpp.o] 오류 1
CMakeFiles/Makefile2:907: 'testpkg/CMakeFiles/jungjaenode.dir/all' 타겟에 대한 명령이 실패했습니다
make[1]: *** [testpkg/CMakeFiles/jungjaenode.dir/all] 오류 2
Makefile:138: 'all' 타겟에 대한 명령이 실패했습니다
make: *** [all] 오류 2
Invoking "make -j4 -l4" failed
kjj@kjj-500R5M-500R5W-501R5M:~/test_ws$

```

EXPLORER

OPEN EDITORS

TEST_WS

.vscode

build

devel

src

testpkg

include

src

jungjae.cpp 9+

listener.cpp

talker.cpp

testnode.cpp

CMakeLists.txt

package.xml

CMakeLists.txt

.catkin_workspace

OUTLINE

CMakeLists.txt

jungjae.cpp

src > testpkg > src > jungjae.cpp > ...

```
1  #include "ros/ros.h"
2  #include "std_msgs/Int64.h"
3
4  void chatterCallback(const std_msgs::Int64::ConstPtr& msg)
5  {
6      ROS_INFO("I heard: [%s]", msg->data.c_str());
7  }
8
9  msg->data;
10 /* rand example: guess the number */
11 #include <stdio.h> /* printf, scanf, puts, NULL */
12 #include <stdlib.h> /* srand, rand */
13 #include <time.h>
14 /* time */
15
16 int main ()
17 {
18     chatter_pub = n.advertise<std_msgs::Int64>(토픽이름, 1000)
19
20     int iSecret, iGuess;
21     /* initialize random seed: */
22     srand (time(NULL));
23
24     /* generate secret number between 1 and 10: */
25     iSecret = rand() % 10 + 1;
26
27     do {
28         printf ("Guess the number (1 to 10): ");
29         scanf ("%d",&iGuess);
30         if (iSecret<iGuess) puts ("The secret number is lower");
31         else if (iSecret>iGuess) puts ("The secret number is higher");
32     } while (iSecret!=iGuess);
33
34     puts ("Congratulations!");
35     return 0;
36 }
37
```

ROS1.kinetic Python 3.5.2 64-bit 11 0 CMake: [Debug] 준비 선택된 키트가 없음 빌드 [all]

Ln 37, Col 1 Spaces: 2 UTF-8 LF C++ ROS