ECE 4703
Mobile Autonomous Robots

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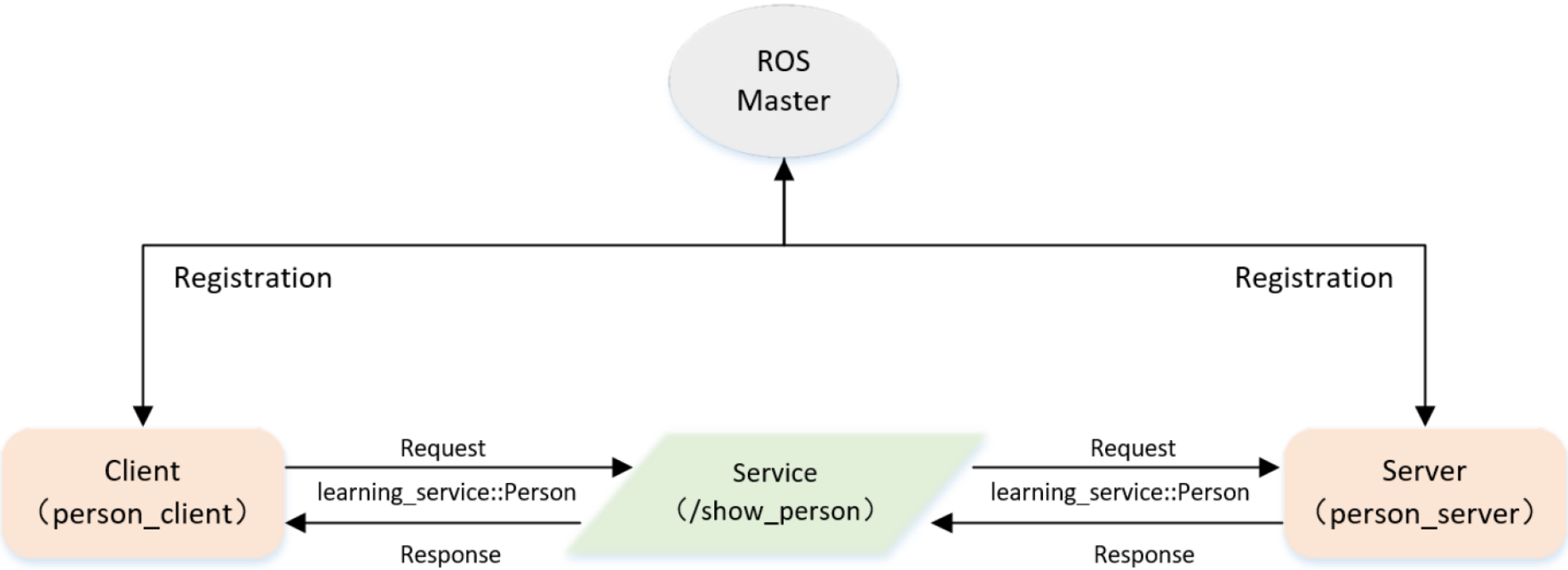
Lecture 10: Service Data

Server Model

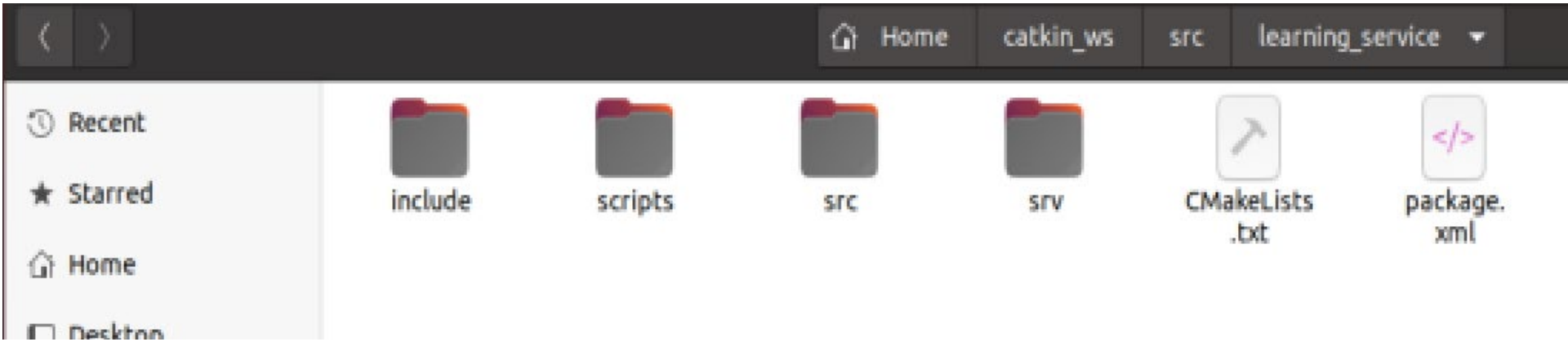


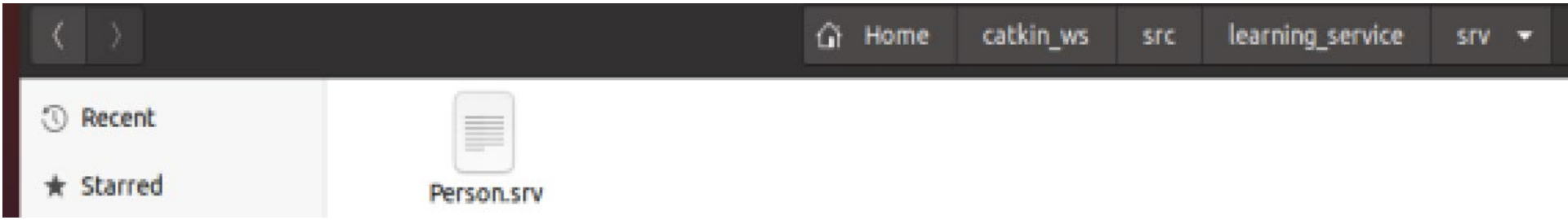
Service File

```
string name
uint8 sex
uint8 age

unit8 unknown = 0
uint8 male = 1
uint8 female =2

---
string result
```

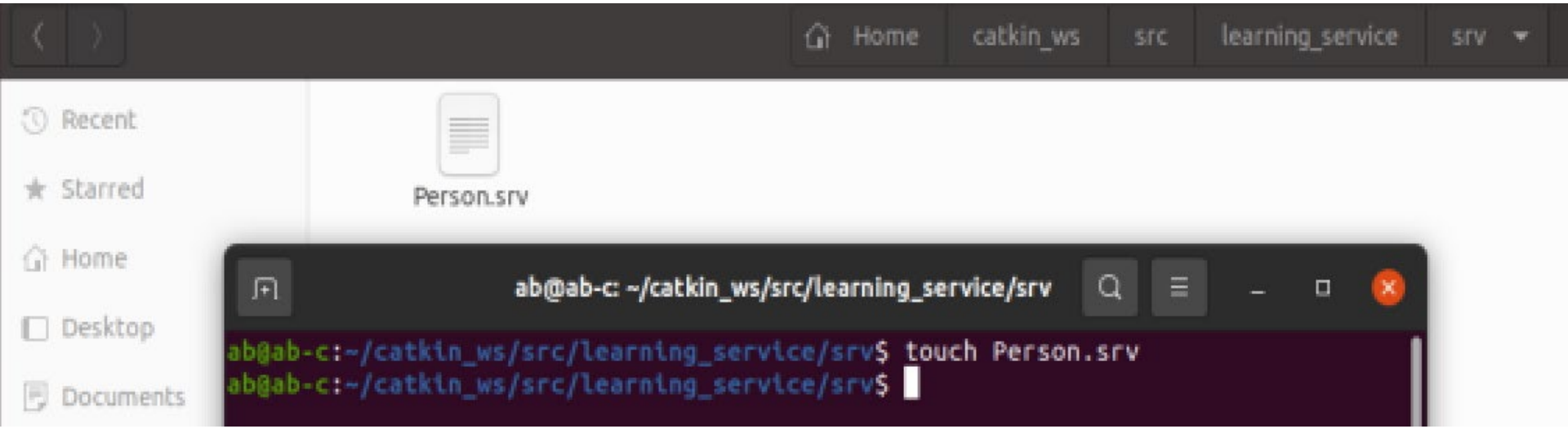
touch Person.srv

Build srv in learning_service

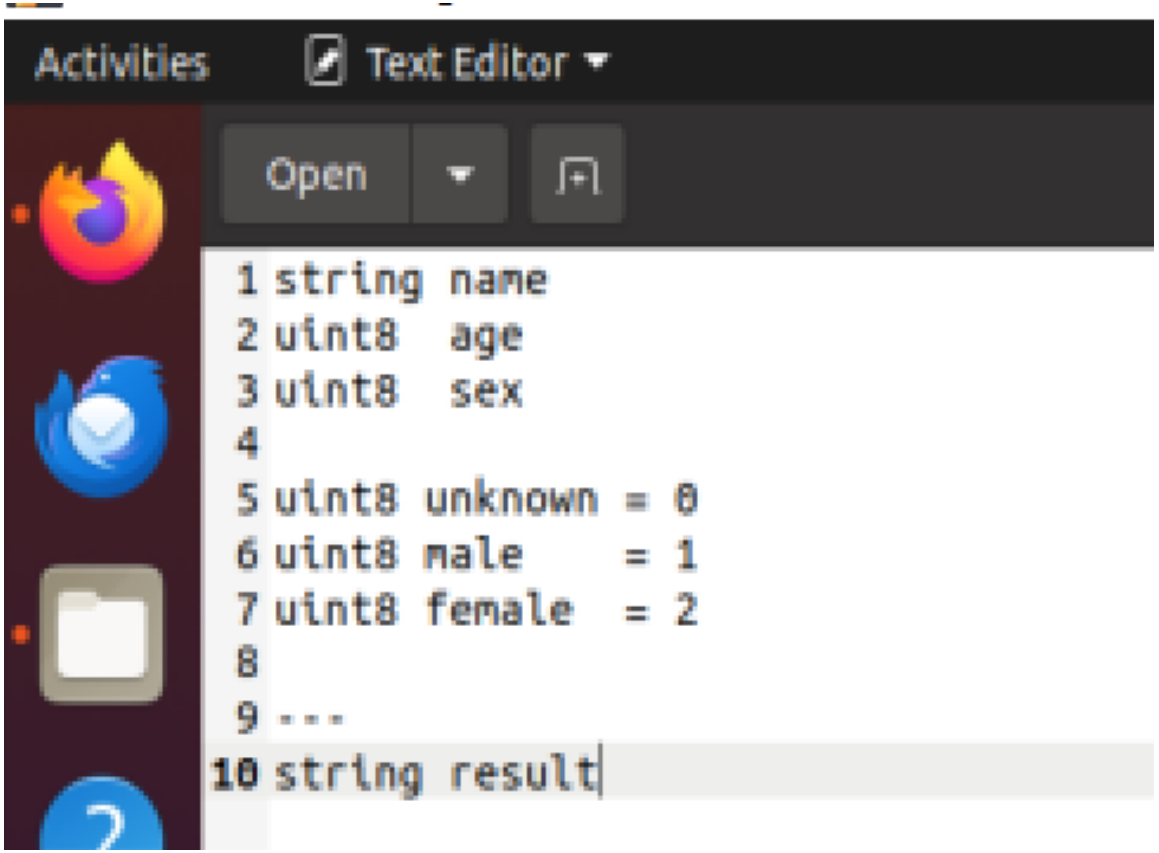




Build Service File Person.srv



Data Interface Definition Person.srv



Add Dependence in package.xml

Home catkin_ws src learning_service

Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
Other Locations

include scripts src srv CMakeLists.txt package.xml

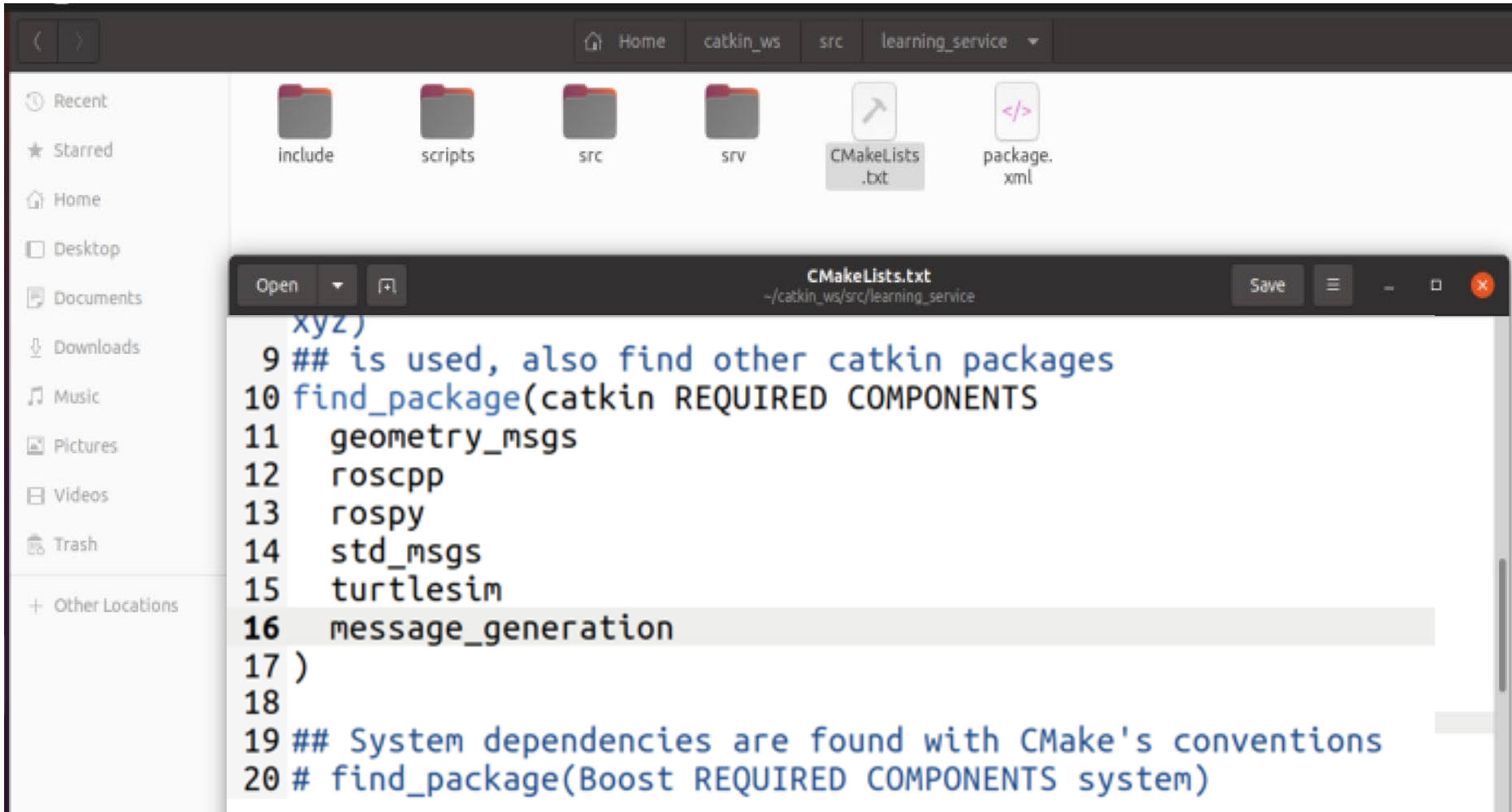
Open package.xml ~/catkin_ws/src/learning_service Save

Person.srv package.xml

```
39  <!-- Use build_depend for packages you need at compile time: -->
40  <!--   <build_depend>message_generation</build_depend> -->
41  <!-- Use build_export_depend for packages you need in order to build against this package: -->
42  <!--   <build_export_depend>message_generation</build_export_depend> -->
43  <!-- Use buildtool_depend for build tool packages: -->
44  <!--   <buildtool_depend>catkin</buildtool_depend> -->
45  <!-- Use exec_depend for packages you need at runtime: -->
46  <!--   <exec_depend>message_runtime</exec_depend> -->
47  <!-- Use test_depend for packages you need only for testing: -->
48  <!--   <test_depend>gtest</test_depend> -->
49  <!-- Use doc_depend for packages you need only for building documentation: -->
50  <!--   <doc_depend>doxygen</doc_depend> -->
51  <buildtool_depend>catkin</buildtool_depend>
52  <build_depend>geometry_msgs</build_depend>
53  <build_depend>roscpp</build_depend>
54  <build_depend>rospy</build_depend>
55  <build_depend>std_msgs</build_depend>
56  <build_depend>turtlesim</build_depend>
57  <build_export_depend>geometry_msgs</build_export_depend>
58  <build_export_depend>roscpp</build_export_depend>
59  <build_export_depend>rospy</build_export_depend>
60  <build_export_depend>std_msgs</build_export_depend>
61  <build_export_depend>turtlesim</build_export_depend>
62  <exec_depend>geometry_msgs</exec_depend>
63  <exec_depend>roscpp</exec_depend>
64  <exec_depend>rospy</exec_depend>
65  <exec_depend>std_msgs</exec_depend>
66  <exec_depend>turtlesim</exec_depend>
67
68 <build_depend>message_generation</build_depend>
69  <exec_depend>message_runtime</exec_depend>
70
71  <!-- The export tag contains other, unspecified, tags -->
72  <export>
73    <!-- Other tools can request additional information be placed here -->
```

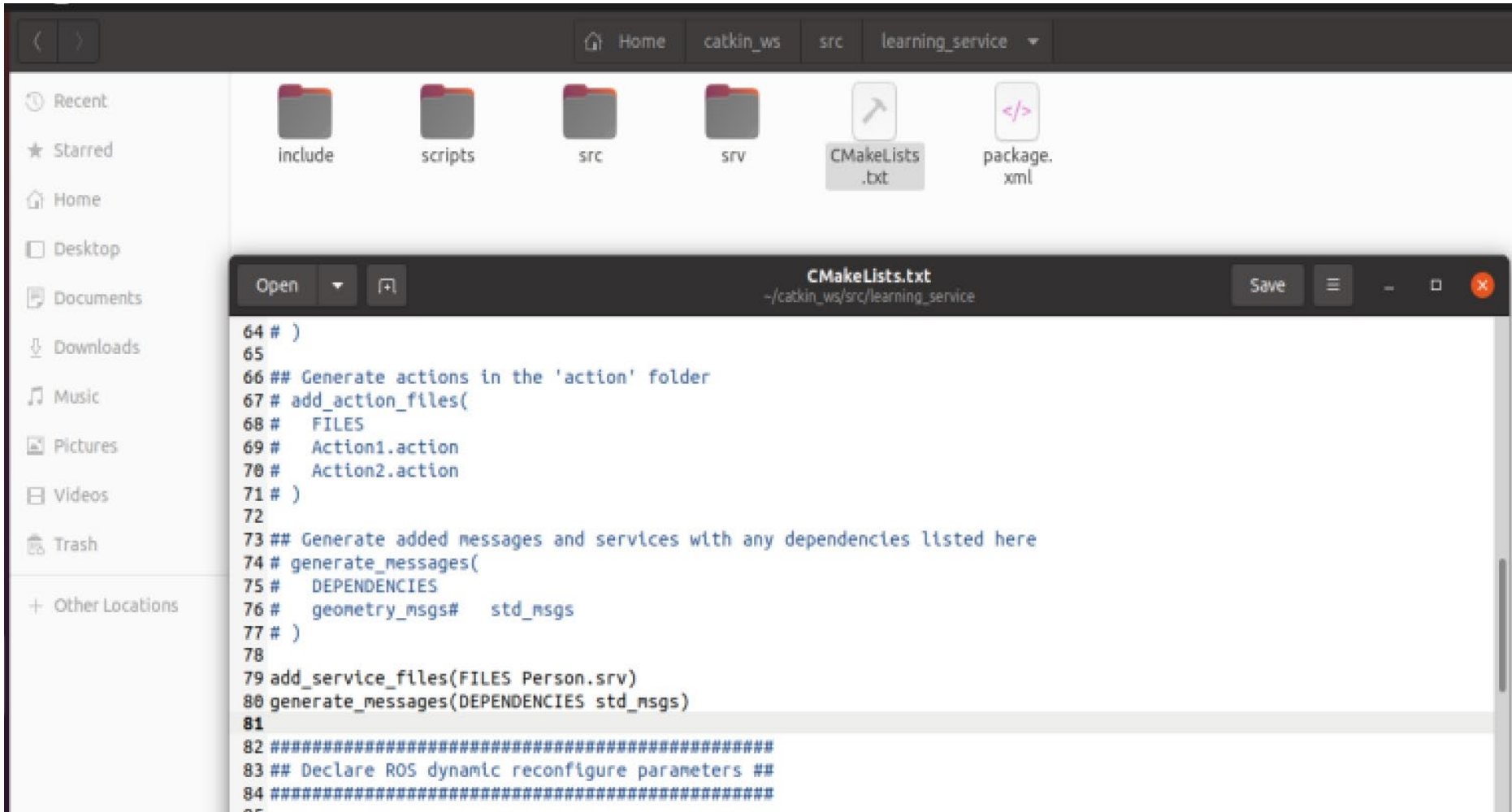
Add Compile Options in CMakeLists.txt

1. message_generation



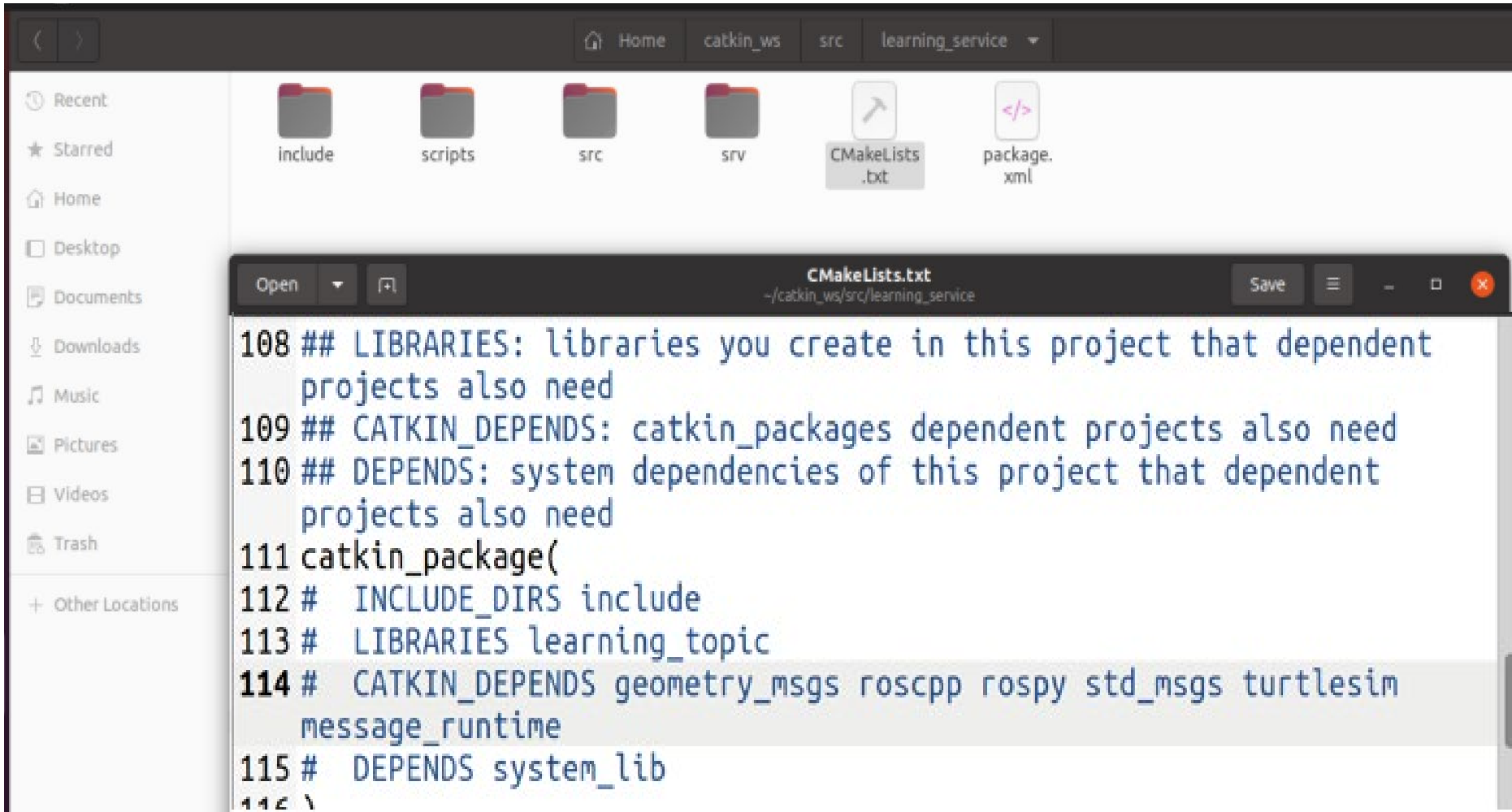
Add Compile Options in CMakeLists.txt

2. add_message_files(FILES Person.srv)
generate_messages(DEPENDENCIES std_msgs)

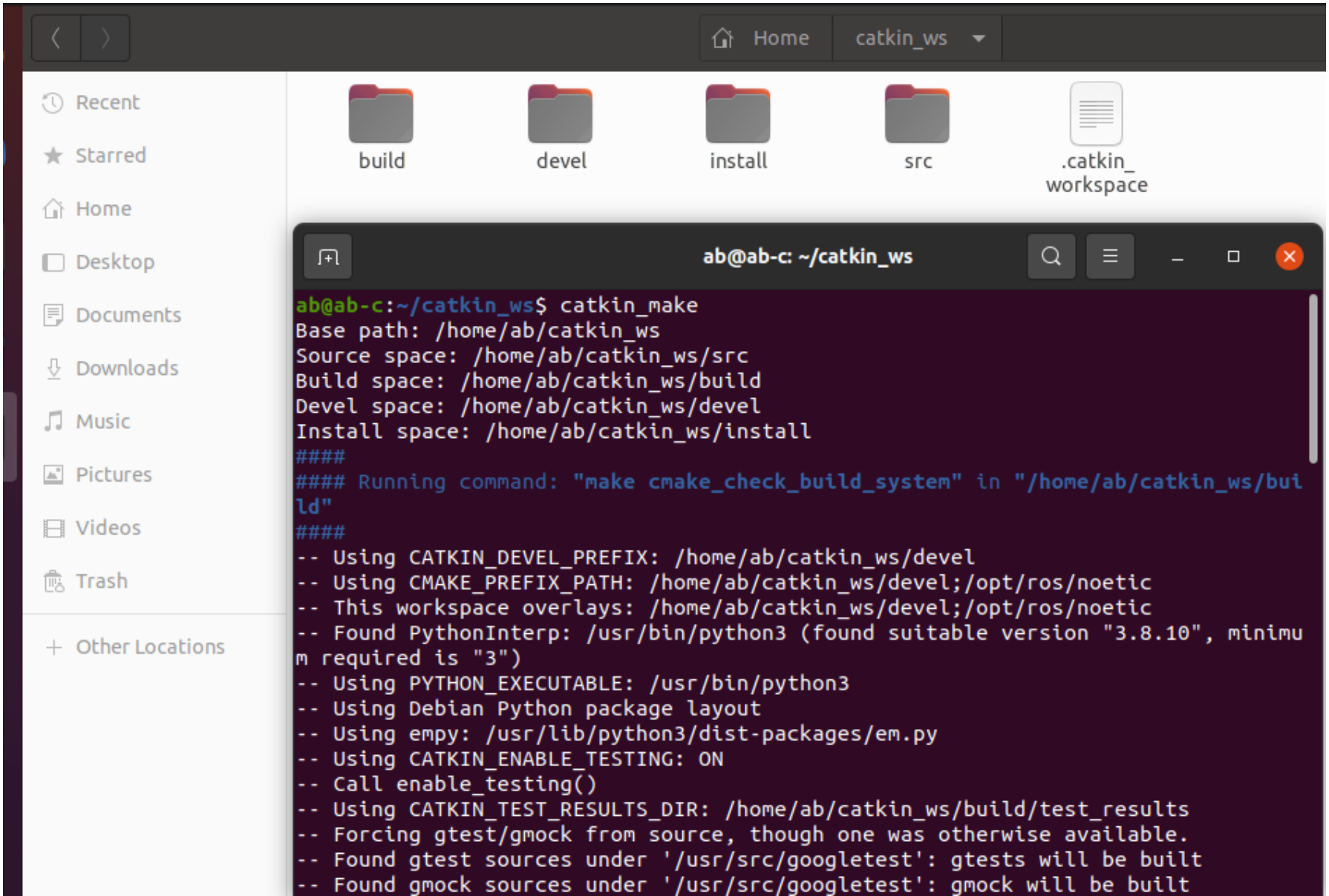


Add Compile Options in CMakeLists.txt

1. message_generation



catkin_make Compile



Create the Service Client Node Code C++

Open | person_client.cpp ~/catkin_ws/src/learning_service/src | Save

```cpp
#include <ros/ros.h>
#include "learning_service/Person.h"

int main(int argc, char** argv)
{

        ros::init(argc, argv, "person_client");


        ros::NodeHandle node;


        ros::service::waitForService("/show_person");
        ros::ServiceClient person_client = node.serviceClient<learning_service::Person>("/show_person");

        learning_service::Person srv;
        srv.request.name = "Tom";
        srv.request.age  = 20;
        srv.request.sex  = learning_service::Person::Request::male;

        ROS_INFO("Call service to show person[name:%s, age:%d, sex:%d]",
                        srv.request.name.c_str(), srv.request.age, srv.request.sex);

        person_client.call(srv);


        ROS_INFO("Show person result : %s", srv.response.result.c_str());

        return 0;
};
```

Create the Service Server Node Code C++

Open

person_server.cpp
~/catkin_ws/src/learning_service/src

```cpp
#include <ros/ros.h>
#include "learning_service/Person.h"


bool personCallback(learning_service::Person::Request  &req,
                                learning_service::Person::Response &res)
{

    ROS_INFO("Person: name:%s  age:%d  sex:%d", req.name.c_str(), req.age, req.sex);


        res.result = "OK";

    return true;
}

int main(int argc, char **argv)
{

    ros::init(argc, argv, "person_server");


    ros::NodeHandle n;


    ros::ServiceServer person_service = n.advertiseService("/show_person", personCallback);

    ROS_INFO("Ready to show person informtion.");
    ros::spin();

    return 0;
}
```

Compiling Code

Home catkin_ws src learning_service

Recent
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Desktop
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Pictures
Videos
Trash
Other Locations

include scripts src srv CMakeLists.txt package.xml

Open

CMakeLists.txt
~/catkin_ws/src/learning_service

person_server.cpp

```
155 # target_link_libraries(${PROJECT_NAME}_node
156 #   ${catkin_LIBRARIES}
157 # )
158
159 add_executable(turtle_spawn src/turtle_spawn.cpp)
160 target_link_libraries(turtle_spawn ${catkin_LIBRARIES})
161
162 add_executable(turtle_command_server src/turtle_command_server.cpp)
163 target_link_libraries(turtle_command_server ${catkin_LIBRARIES})
164
165 # add_executable(turtle_command_server scripts/turtle_command_server.py)
166 # target_link_libraries(turtle_command_server ${catkin_LIBRARIES})
167
168 add_executable(person_server src/person_server.cpp)
169 target_link_libraries(person_server ${catkin_LIBRARIES})
170 add_dependencies(person_server ${PROJECT_NAME}_gencpp)
171
172 add_executable(person_client src/person_client.cpp)
173 target_link_libraries(person_client ${catkin_LIBRARIES})
174 add_dependencies(person_client ${PROJECT_NAME}_gencpp)
175
176 #############
177 ## Install ##
178 #############
```

catkin_make Compile

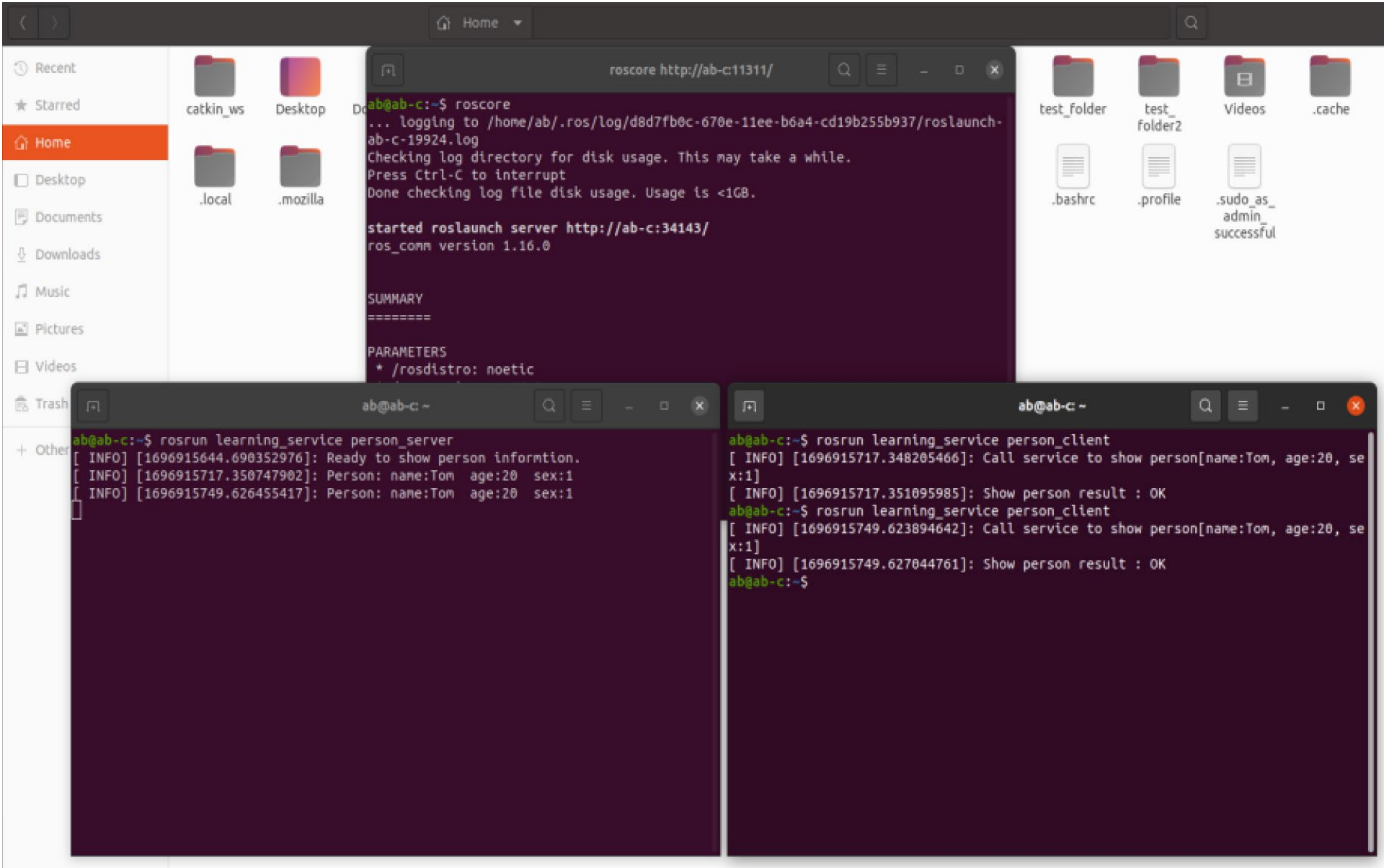
```
ab@ab-c: ~/catkin_ws

ab@ab-c:~/catkin_ws$ catkin_make
Base path: /home/ab/catkin_ws
Source space: /home/ab/catkin_ws/src
Build space: /home/ab/catkin_ws/build
Devel space: /home/ab/catkin_ws/devel
Install space: /home/ab/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/ab/catkin_ws
/build"
####
####
#### Running command: "make -j2 -l2" in "/home/ab/catkin_ws/build"
####
[  0%] Built target std_msgs_generate_messages_cpp
[  0%] Built target _learning_topic_generate_messages_check_deps_Person
[ 15%] Built target velocity_publisher
[ 15%] Built target std_msgs_generate_messages_eus
[ 15%] Built target std_msgs_generate_messages_py
[ 15%] Built target std_msgs_generate_messages_lisp
[ 15%] Built target std_msgs_generate_messages_nodejs
[ 23%] Built target learning_topic_generate_messages_cpp
[ 38%] Built target learning_topic_generate_messages_eus
ab@ab-c:~$
```

Server and Client Compile

```
$ cd ~/catkin_ws
$ catkin_make
$ source devel/setup.bash
$ roscore
$ rosrun learning_service person_server
$ rosrun learning_service person_client
```

Server and Client Compile



Create Client Code Python

Open

person_client.py
~/catkin_ws/src/learning_service/scripts

```python
import sys
import rospy
from learning_service.srv import Person, PersonRequest

def person_client():

    rospy.init_node('person_client')


    rospy.wait_for_service('/show_person')
    try:
        person_client = rospy.ServiceProxy('/show_person', Person)


        response = person_client("Tom", 20, PersonRequest.male)
        return response.result
    except rospy.ServiceException, e:
        print "Service call failed: %s"%e

if __name__ == "__main__":

    print "Show person result : %s" %(person_client())

```

Create Server Code Python

```
import rospy
from learning_service.srv import Person, PersonResponse

def personCallback(req):

    rospy.loginfo("Person: name:%s  age:%d  sex:%d", req.name, req.age, req.sex)

    return PersonResponse("OK")

def person_server():

    rospy.init_node('person_server')

    s = rospy.Service('/show_person', Person, personCallback)

    print "Ready to show person informtion."
    rospy.spin()

if __name__ == "__main__":
    person_server()
```