

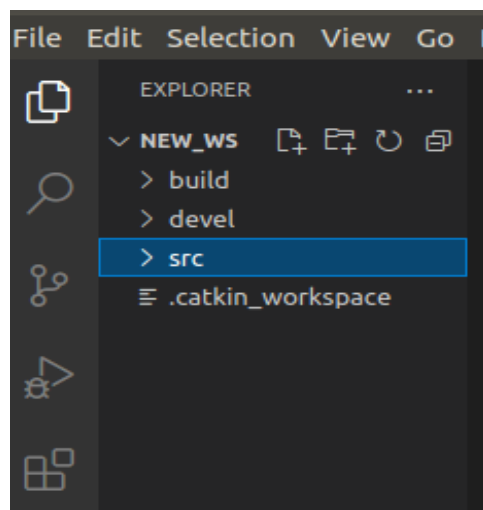
ASSIGNMENT-6

MAKE 4 WHEELED ROBOT WITH URDF AND XACRO (Entire Workspace uploaded on Github)

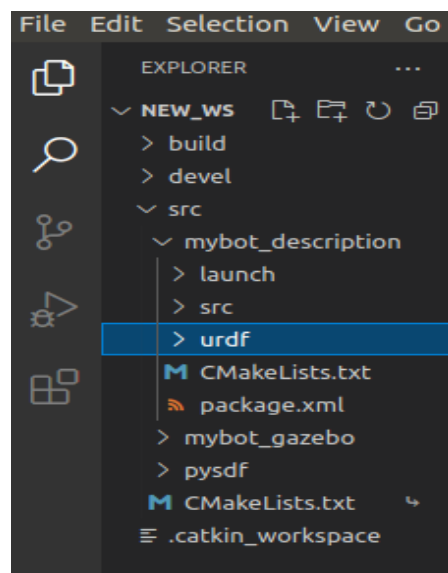
NAME: KAVISH MEHTA

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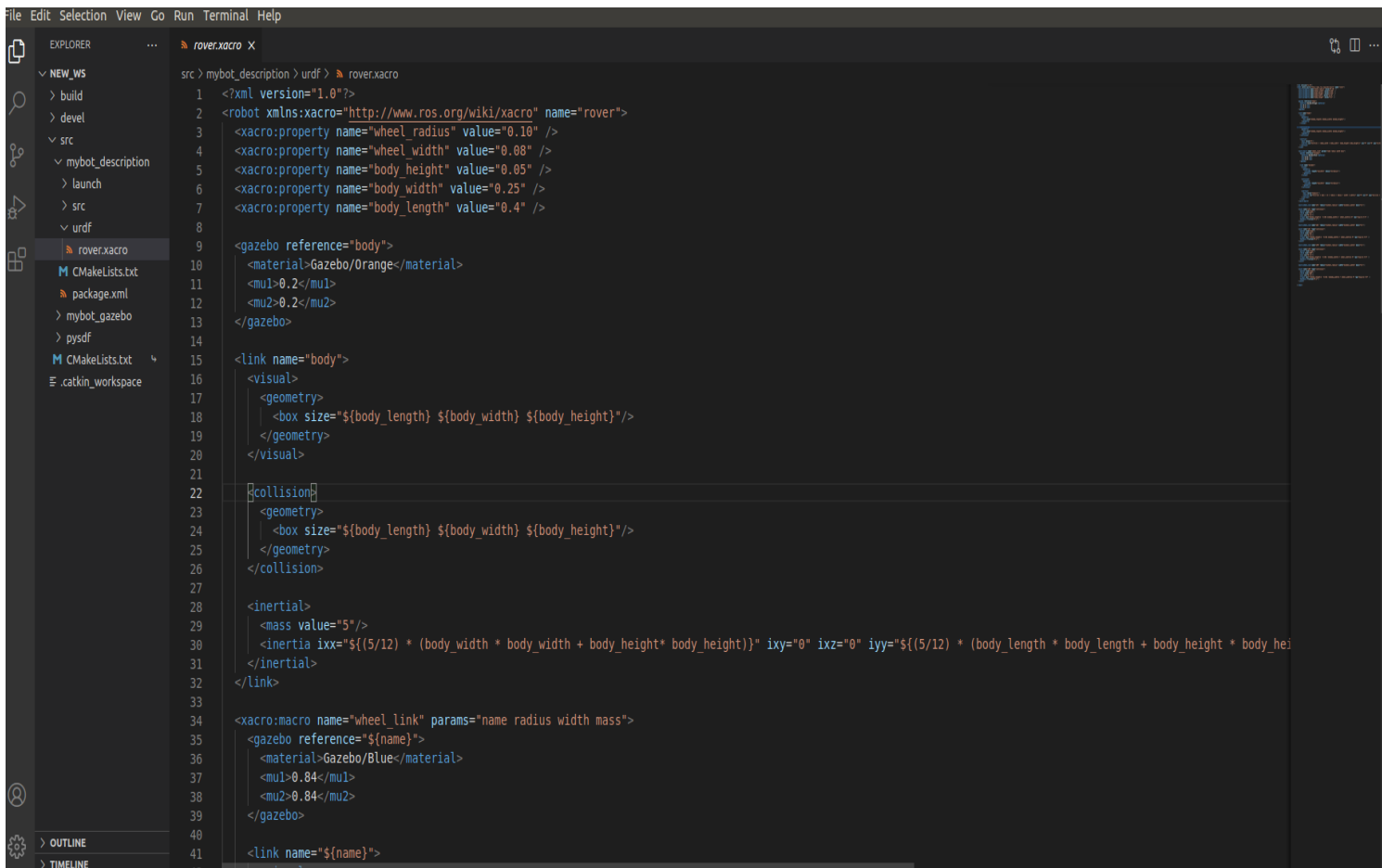
1) Created a fresh new workspace :



2) Created a New Package Named mybot_description and also created a folder inside it with name urdf :



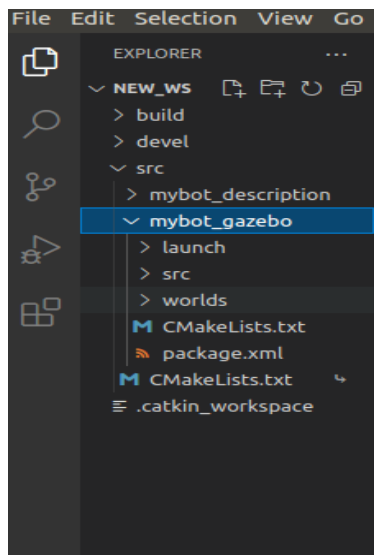
3) Created Xacro File for the 4 wheeled robot :



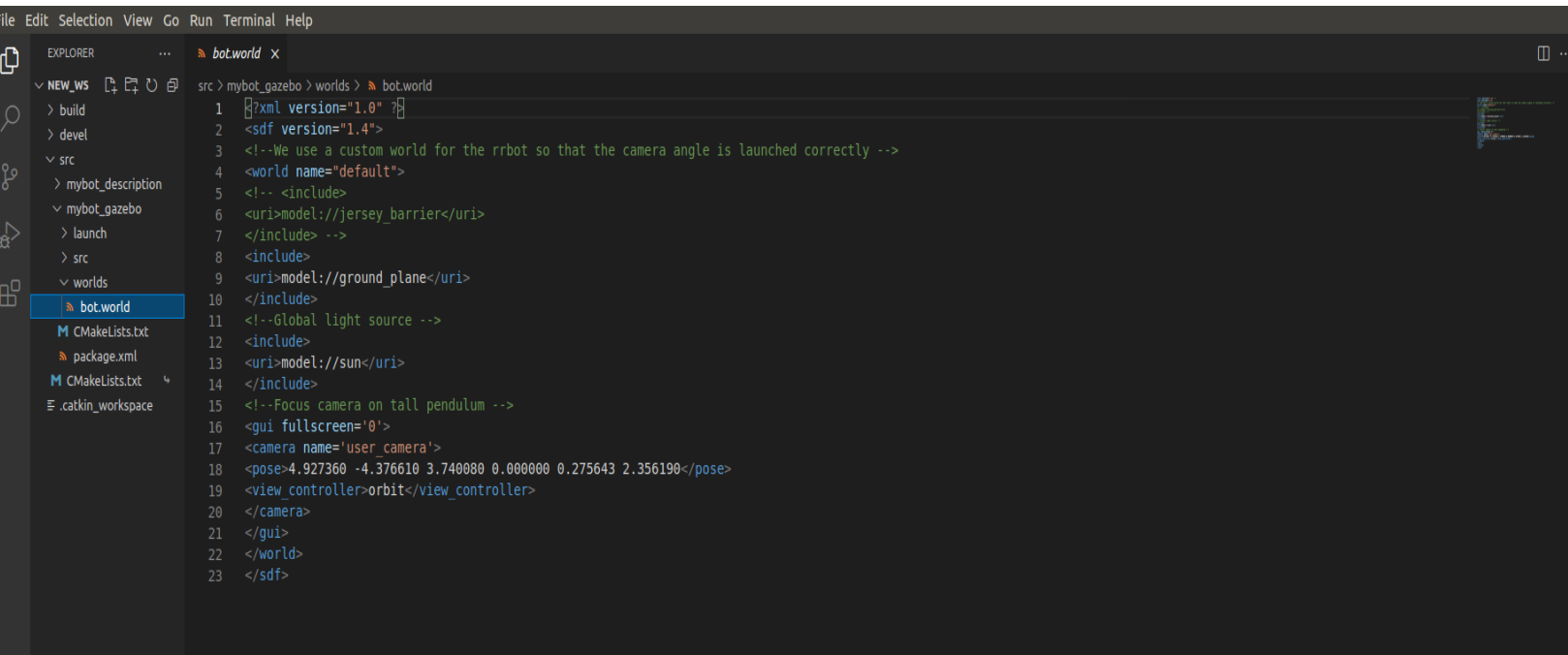
```
File Edit Selection View Go Run Terminal Help
EXPLORER
NEW_WS
  build
  devel
  src
    mybot_description
      launch
      src
      urdf
        rover.xacro
      CMakeLists.txt
      package.xml
    mybot_gazebo
    pysdf
  CMakeLists.txt
  .catkin_workspace

src > mybot_description > urdf > rover.xacro
1 <?xml version="1.0"?>
2 <robot xmlns:xacro="http://www.ros.org/wiki/xacro" name="rover">
3   <xacro:property name="wheel_radius" value="0.10" />
4   <xacro:property name="wheel_width" value="0.08" />
5   <xacro:property name="body_height" value="0.05" />
6   <xacro:property name="body_width" value="0.25" />
7   <xacro:property name="body_length" value="0.4" />
8
9   <gazebo reference="body">
10     <material>Gazebo/Orange</material>
11     <mu1>0.2</mu1>
12     <mu2>0.2</mu2>
13   </gazebo>
14
15   <link name="body">
16     <visual>
17       <geometry>
18         <box size="${body_length} ${body_width} ${body_height}" />
19       </geometry>
20     </visual>
21
22     <collision>
23       <geometry>
24         <box size="${body_length} ${body_width} ${body_height}" />
25       </geometry>
26     </collision>
27
28     <inertial>
29       <mass value="5"/>
30       <inertia ixx="${(5/12) * (body_width * body_width + body_height * body_height)}" ixy="0" ixz="0" iyy="${(5/12) * (body_length * body_length + body_height * body_height)}" iyz="0" izz="${(5/12) * (body_length * body_length + body_width * body_width)}" />
31     </inertial>
32   </link>
33
34   <xacro:macro name="wheel_link" params="name radius width mass">
35     <gazebo reference="${name}">
36       <material>Gazebo/Blue</material>
37       <mu1>0.84</mu1>
38       <mu2>0.84</mu2>
39     </gazebo>
40
41     <link name="${name}">
```

4) Created a mybot_gazebo package with 2 folders launch and worlds :

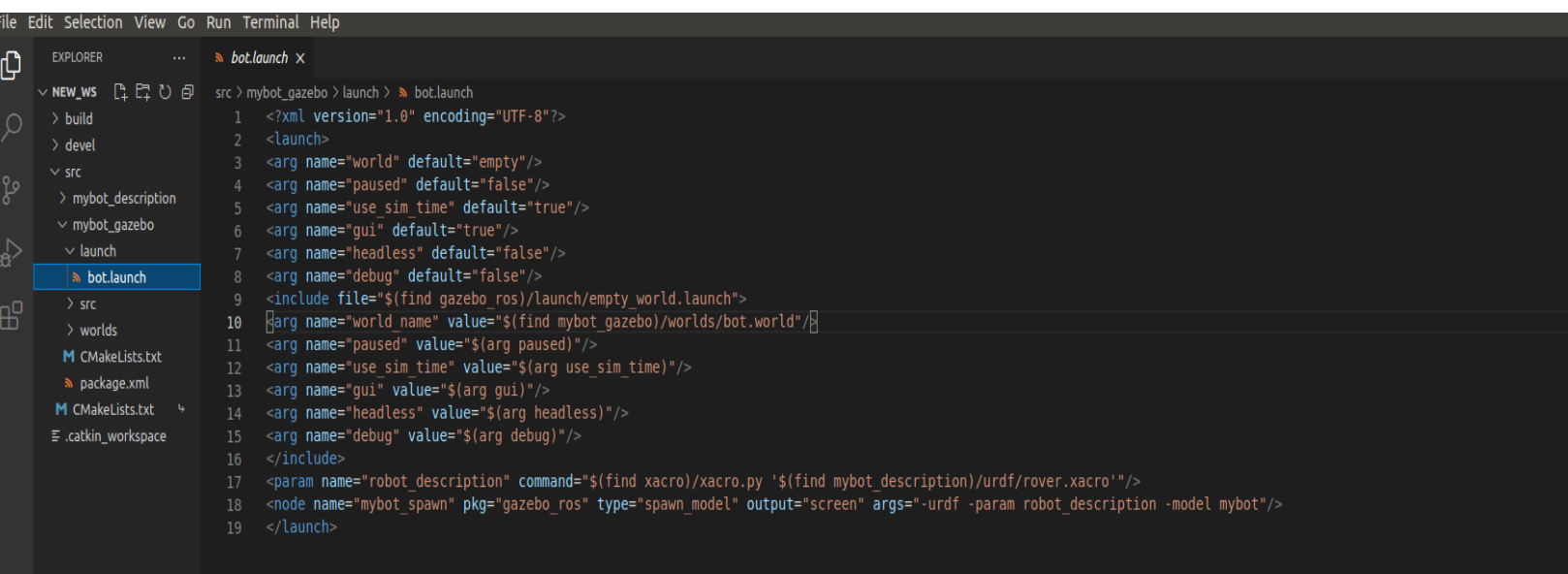


5) Created a world file for gazebo:



```
1 <?xml version="1.0" ?>
2 <sdf version="1.4">
3 <!-- We use a custom world for the rrbot so that the camera angle is launched correctly -->
4 <world name="default">
5 <!-- <include>
6 <uri>model://jersey_barrier</uri>
7 </include> -->
8 <include>
9 <uri>model://ground_plane</uri>
10 </include>
11 <!-- Global light source -->
12 <include>
13 <uri>model://sun</uri>
14 </include>
15 <!-- Focus camera on tall pendulum -->
16 <gui fullscreen="0">
17 <camera name="user_camera">
18 <pose>4.927360 -4.376610 3.740080 0.000000 0.275643 2.356190</pose>
19 <view_controller>orbit</view_controller>
20 </camera>
21 </gui>
22 </world>
23 </sdf>
```

6) Created a Launch file to launch robot in the world:



```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <launch>
3 <arg name="world" default="empty"/>
4 <arg name="paused" default="false"/>
5 <arg name="use_sim_time" default="true"/>
6 <arg name="gui" default="true"/>
7 <arg name="headless" default="false"/>
8 <arg name="debug" default="false"/>
9 <include file="$(find gazebo_ros)/launch/empty_world.launch">
10 <arg name="world_name" value="$(find mybot_gazebo)/worlds/bot.world"/>
11 <arg name="paused" value="$(arg paused)"/>
12 <arg name="use_sim_time" value="$(arg use_sim_time)"/>
13 <arg name="gui" value="$(arg gui)"/>
14 <arg name="headless" value="$(arg headless)"/>
15 <arg name="debug" value="$(arg debug)"/>
16 </include>
17 <param name="robot_description" command="$(find xacro)/xacro.py '$(find mybot_description)/urdf/rover.xacro'"/>
18 <node name="mybot_spawn" pkg="gazebo_ros" type="spawn_model" output="screen" args="-urdf -param robot_description -model mybot"/>
19 </launch>
```

7) Ran the launch file to view the robot

