

ASSIGNMENT 6

FOUR WHEEL BOT

CODE :

```
<?xml version="1.0" ?>

<robot name="robot_1" xmlns:xacro="https://www.ros.org/wiki/xacro" >

  <gazebo reference="base_link">
    <material>Gazebo/white</material>
  </gazebo>
  <gazebo reference="left_wheel">
    <material>Gazebo/Red</material>
  </gazebo>
  <gazebo reference="right_wheel">
    <material>Gazebo/Red</material>
  </gazebo>
  <gazebo reference="left_f_wheel">
    <material>Gazebo/Blue</material>
  </gazebo>
  <gazebo reference="right_f_wheel">
    <material>Gazebo/Blue</material>
  </gazebo>
  <gazebo reference="camera_link">
    <material>Gazebo/Red</material>
  </gazebo>

  <gazebo>
    <plugin name="skid_steer_drive_controller" filename="libgazebo_ros_skid_steer_drive.so">
      <updateRate>100.0</updateRate>
      <robotNamespace>/</robotNamespace>
      <leftFrontJoint>left_f_wheel_joint</leftFrontJoint>
      <rightFrontJoint>right_f_wheel_joint</rightFrontJoint>
```

```

    <leftRearJoint>left_wheel_joint</leftRearJoint>
    <rightRearJoint>right_wheel_joint</rightRearJoint>
    <wheelSeparation>0.15</wheelSeparation>
    <wheelDiameter>0.07</wheelDiameter>
    <robotBaseFrame>base_link</robotBaseFrame>
    <torque>20</torque>
    <topicName>cmd_vel</topicName>
    <broadcastTF>>false</broadcastTF>
  </plugin>
</gazebo>

</robot>

```

XACRO FILE :

CODE.

```

<?xml version="1.0"?>
<robot name="m4w_robot" xmlns:xacro="http://www.ros.org/wiki/xacro">
  <xacro:include filename="$(find mybot_description)/urdf/materials.xacro" />
  <xacro:include filename="$(find mybot_description)/urdf/m4w_robot.gazebo" />

  <xacro:property name="base_width" value="0.16"/>
  <xacro:property name="base_len" value="0.2"/>
  <xacro:property name="wheel_radius" value="0.035"/>
  <xacro:property name="base_wheel_gap" value="0.007"/>
  <xacro:property name="wheel_separation" value="0.15"/>

```

```
<xacro:property name="wheel_joint_offset" value="0.02"/>
```

```
<xacro:macro name="box_inertia" params="m w h d">
```

```
  <inertial>
```

```
    <mass value="{m}"/>
```

```
    <inertia ixx="{m / 12.0 * (d*d + h*h)}" ixy="0.0" ixz="0.0" iyy="{m / 12.0 * (w*w + h*h)}"
    iyz="0.0" izz="{m / 12.0 * (w*w + d*d)}"/>
```

```
  </inertial>
```

```
</xacro:macro>
```

```
<link name="base_footprint">
```

```
  <xacro:box_inertia m="20" w="0.001" h="0.001" d="0.001"/>
```

```
  <visual>
```

```
    <origin xyz="0 0 0" rpy="0 0 0" />
```

```
    <geometry>
```

```
      <box size="0.001 0.001 0.001" />
```

```
    </geometry>
```

```
    <material name="green"/>
```

```
  </visual>
```

```
</link>
```

```
<link name="base_link">
```

```
  <xacro:box_inertia m="10" w="{base_len}" h="{base_width}" d="0.02"/>
```

```
  <visual>
```

```
    <geometry>
```

```
      <box size="{base_len} {base_width} 0.02"/>
```

```
    </geometry>
```

```
<material name="white"/>
```

```
</visual>
```

```
<collision>
```

```
  <geometry>
```

```

        <box size="{base_len} {base_width} 0.02"/>
    </geometry>

</collision>
</link>

<xacro:macro name="cylinder_inertia" params="m r h">
    <inertial>
        <mass value="{m}"/>
        <inertia ixx="{m*(3*r*r+h*h)/12}" ixy = "0" ixz = "0" iyy="{m*(3*r*r+h*h)/12}" iyz = "0"
        izz="{m*r*r/2}"/>
    </inertial>
</xacro:macro>

<xacro:macro name="wheel" params="prefix reflect wheel_joint">
    <link name="{prefix}_wheel">
        <visual>
            <origin xyz="0 0 0" rpy="{pi/2} 0 0"/>
            <geometry>
                <cylinder radius="{wheel_radius}" length="0.01"/>
            </geometry>
        </visual>
        <collision>
            <origin xyz="0 0 0" rpy="{pi/2} 0 0"/>
            <geometry>
                <cylinder radius="{wheel_radius}" length="0.01"/>
            </geometry>
        </collision>
        <xacro:cylinder_inertia m="10" r="{wheel_radius}" h="0.005"/>
    </link>

    <joint name="{prefix}_wheel_joint" type="continuous">

```

```

    <axis xyz="0 1 0" rpy="0 0 0" />
    <parent link="base_link"/>
    <child link="${prefix}_wheel"/>
    <origin xyz="${wheel_joint} ${((base_width/2)+base_wheel_gap)*reflect} -0.005" rpy="0 0 0"/>
  </joint>
</xacro:macro>

```

```

<xacro:wheel prefix="left" reflect="1" wheel_joint="0.08" />
<xacro:wheel prefix="right" reflect="-1" wheel_joint="0.08"/>
<xacro:wheel prefix="left_f" reflect="1" wheel_joint="-0.08" />
<xacro:wheel prefix="right_f" reflect="-1" wheel_joint="-0.08"/>
<joint name="base_link_joint" type="fixed">
  <origin xyz="0 0 ${wheel_radius + 0.005}" rpy="0 0 0" />
  <parent link="base_footprint"/>
  <child link="base_link" />
</joint>

```

```

</robot>

```