

A.5 Practice 08

A.5.1 macros2.urdf.xacro

```
1 <?xml version="1.0" ?>
2 <robot xmlns:xacro="http://www.ros.org/wiki/xacro">
3
4   <xacro:macro name="m_joint" params="name type axis_xyz origin_rpy
5     origin_xyz parent child limit_e limit_l limit_u limit_v">
6     <joint name="${name}" type="${type}">
7       <axis xyz="${axis_xyz}" />
8       <limit effort="${limit_e}" lower="${limit_l}" upper="${limit_u}"
9         velocity="${limit_v}" />
10      <origin rpy="${origin_rpy}" xyz="${origin_xyz}" />
11      <parent link="${parent}" />
12      <child link="${child}" />
13    </joint>
14  </xacro:macro>
15
16  <xacro:macro name="m_link" params="name origin_xyz origin_rpy radius
17    length mass ixx ixy ixz iyy iyz izz">
18    <link name="${name}">
19      <inertial>
20        <mass value="${mass}" />
21        <origin rpy="${origin_rpy}" xyz="${origin_xyz}" />
22        <inertia ixx="${ixx}" ixy="${ixy}" ixz="${ixz}" iyy="${iyy}" iyz
23          ="${iyz}" izz="${izz}" />
24      </inertial>
25      <collision>
26        <origin rpy="${origin_rpy}" xyz="${origin_xyz}" />
27        <geometry>
28          <cylinder radius="${radius}" length="${length}" />
29        </geometry>
30      </collision>
31      <visual>
32        <origin rpy="${origin_rpy}" xyz="${origin_xyz}" />
33        <geometry>
34          <cylinder radius="${radius}" length="${length}" />
35        </geometry>
36      </visual>
37    </link>
38  </xacro:macro>
39
40 </robot>
```

A.5.2 robot2.urdf.xacro

```
1 <?xml version="1.0" ?>
2 <robot name="robot1" xmlns:xacro="http://www.ros.org/wiki/xacro">
3
4   <!-- Start of Includes-->
```

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5  <xacro:include filename="$(find robot_modelling)/urdf/macros2.urdf.
   xacro" />
6  <!-- End of Includes -->
7
8
9  <!-- Start of robot description -->
10  <link name="base_link">
11    <inertial>
12      <mass value="1024" />
13      <origin rpy="0 0 0" xyz="0 0 0.25" />
14      <inertia ixx="170.667" ixy="0" ixz="0" iyy="170.667" iyz="0"
   izz="170.667" />
15    </inertial>
16    <collision>
17      <origin rpy="0 0 0" xyz="0 0 0.25" />
18      <geometry>
19        <box size="1 1 0.5" />
20      </geometry>
21    </collision>
22    <visual>
23      <origin rpy="0 0 0" xyz="0 0 0.25"/>
24      <geometry>
25        <box size="1 1 0.5"/>
26      </geometry>
27    </visual>
28  </link>
29
30  <xacro:m_joint name="J_0" type="revolute"
31    axis_xyz="0 0 1"
32    origin_rpy="0 0 0" origin_xyz="0 0 0.5"
33    parent="base_link" child="link_01"
34    limit_e="1000" limit_l="-3.14" limit_u="3.14" limit_v="
   0.5" />
35
36  <xacro:m_link name="link_01"
37    origin_rpy="0 0 0" origin_xyz="0 0 0.2"
38    radius="0.35" length="0.4"
39    mass="157.633" ixx="13.235" ixy="0" ixz="0" iyy="
   13.235" iyz="0" izz="9.655"/>
40
41
42  <xacro:m_joint name="J_1" type="revolute"
43    axis_xyz="0 1 0"
44    origin_rpy="0 0 0" origin_xyz="0 0 0.4"
45    parent="link_01" child="link_02"
46    limit_e="1000" limit_l="-3.14" limit_u="3.14" limit_v="
   0.5" />
47
48
49  <xacro:m_link name="link_02"
50    origin_rpy="0 0 0" origin_xyz="0 0 0.4"
51    radius="0.15" length="0.8"
52    mass="57.906" ixx="12.679" ixy="0" ixz="0" iyy="
   12.679" iyz="0" izz="0.651"/>

```

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53
54
55     <xacro:m_joint name="J_2" type="revolute"
56         axis_xyz="0 1 0"
57         origin_rpy="0 0 0" origin_xyz="0 0 0.8"
58         parent="link_02" child="link_03"
59         limit_e="1000" limit_l="-3.14" limit_u="3.14" limit_v="
0.5" />
60
61
62     <xacro:m_link name="link_03"
63         origin_rpy="0 0 0" origin_xyz="0 0 0.4"
64         radius="0.15" length="0.8"
65         mass="57.906" ixx="12.679" ixy="0" ixz="0" iyy="
12.679" iyz="0" izz="0.651"/>
66
67
68     <xacro:m_joint name="J_3" type="revolute"
69         axis_xyz="0 1 0"
70         origin_rpy="0 0 0" origin_xyz="0 0 0.8"
71         parent="link_03" child="link_04"
72         limit_e="1000" limit_l="-3.14" limit_u="3.14" limit_v="
0.5" />
73
74
75     <xacro:m_link name="link_04"
76         origin_rpy="0 0 0" origin_xyz="0 0 0.4"
77         radius="0.15" length="0.8"
78         mass="57.906" ixx="12.679" ixy="0" ixz="0" iyy="
12.679" iyz="0" izz="0.651"/>
79
80
81     <xacro:m_joint name="J_4" type="revolute"
82         axis_xyz="0 0 1"
83         origin_rpy="0 0 0" origin_xyz="0 0 0.8"
84         parent="link_04" child="link_05"
85         limit_e="1000" limit_l="-3.14" limit_u="3.14" limit_v="
0.5" />
86
87
88     <xacro:m_link name="link_05"
89         origin_rpy="0 0 0" origin_xyz="0 0 0.125"
90         radius="0.15" length="0.25"
91         mass="18.056" ixx="0.479" ixy="0" ixz="0" iyy="0.479"
92         iyz="0" izz="0.204"/>
93 <!-- End of robot description -->
</robot>

```