Robot Assembly Exporting

Estimated time to completion: **10 minutes**

8.8 Step 6: Post corrections

After the export has been completed, it's necessary to fix some small errors in the exported file.

- The paths to the meshes are wrong as you can see in the `robot.urdf` .

```
In [ ]:  <mesh filename="package:///torso_quadruped.stl"/>
```

- Add a few more parameters to fix this:

📄 **config.json**

- Add the `packageName` as the path from the `package` to the folder where the meshes will be.
- In this case, the package name is `quadruped_description` and the folder where the meshes will be is `quadruped` .
- Also, add the `robotName` as `quadruped_robot` to be coherent.
- Finally, add the `assemblyName` . The reason is that inside a `document-id` , there can be multiple assemblies. If you do not state anything, it will export the first one it finds.
- In your case, you have three assemblies:
  - `quadruped_v1`
  - `testleg_v1`
  - `hexapod_v1`

🗀 LowerLimb	🗎 quadruped_v1	🗎 testleg_v1	🗎 hexapod_v1
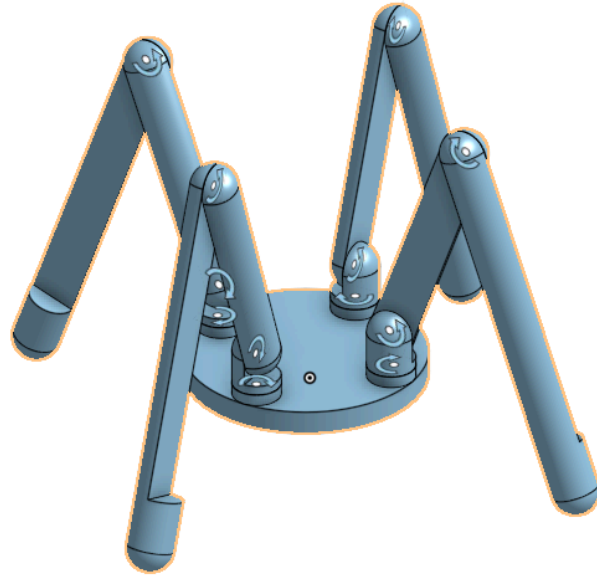
- At the end, you should have a `config.json` file like this:

```
In [ ]:
{
    "documentId": "33b91de06ddc91b068fcf725",
    "outputFormat": "urdf",
    "packageName": "quadruped_description/quadruped",
    "robotName": "quadruped_robot",
    "assemblyName": "quadruped_v1"
}
```

- Now, the meshes should be like this:

```
In [ ]:
<mesh filename="package://quadruped_description/quadruped/torso_quadruped.stl"/>
```

- Add the `format` shebang in the generated file `robot.urdf` :

```
In [ ]:
<?xml version="1.0"?>
    <robot name="onshape">
        <link name="part_1">
        ...
```

- You should now have a `robot.urdf` like this:

- CODE -

📄 **robot.urdf**

```xml
In [ ]:
<?xml version="1.0"?>
<robot name="quadruped_robot">
<link name="torso_quadruped">
<visual>
<origin xyz="-0.036130376160144805908 0.030409909784793798249 0.0019046843051910289368" rpy="0 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/torso_quadruped.stl"/>
</geometry>
<material name="torso_quadruped_material">
<color rgba="0.6156862745098039546 0.8117647058235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="-0.036130376160144805908 0.030409909784793798249 0.0019046843051910289368" rpy="0 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/torso_quadruped.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="-0.036130376160144819786 0.030409909784793826004 0.057460239860746588347" rpy="0 0 0"/>
<mass value="229.02210444669586309" />
<inertia ixx="14.921779706388115017" ixy="-1.12962129121927137e-16"  ixz="0" iyy="14.921779706388111464" iyz="0" izz="29.30634706901237152" />
</inertial>
</link>

<link name="shoulder">
<visual>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
</geometry>
<material name="shoulder_material">
<color rgba="0.6156862745098039546 0.8117647058235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="-3.7347681414163801479e-19 0.027929396093619211772 -0.095649350649350664555" rpy="0 0 0"/>
<mass value="10.885618544688634657" />
<inertia ixx="0.067417122752900543459" ixy="0"  ixz="0" iyy="0.075908462192995490581" iyz="0.0092341600956555008189" izz="0.043109319895117424737" />
</inertial>
</link>

<link name="upperlimb">
<visual>
<origin xyz="-2.7755575615628913511e-17 0 0" rpy="1.570796326794896558 -1.3866695599588098142e-32 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
</geometry>
<material name="upperlimb_material">
<color rgba="0.6156862745098039546 0.8117647058235294379 0.92941176470588238168 1.0"/>
</material>
```

```xml
    </visual>
    <collision>
      <origin xyz="-2.7755575615628913511e-17 0 0" rpy="1.570796326794896558 -1.3866695599588098142e-32 0" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
      </geometry>
    </collision>
    <inertial>
      <origin xyz="-3.0199548200490966469e-17 -0.50000000000000011102 -0.041859986609857721684" rpy="0 0 0"/>
      <mass value="48.066367599923843557" />
      <inertia ixx="5.204489452505125513" ixy="7.5329015287179125501e-65"  ixz="4.77234078996466133e-32" iyy="0.15045227104254321748" iyz="-1.6297108726339258397e-32" izz="5.2887141526857410767" />
    </inertial>
  </link>

  <link name="lowerlimb">
    <visual>
      <origin xyz="-2.2204460492503130808e-16 1.5250000000000001332 -6.9388939039072283776e-18" rpy="1.570796326794896558 -4.6222318665293660473e-33 -5.5511151231257827021e-17" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
      </geometry>
      <material name="lowerlimb_material">
        <color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
      </material>
    </visual>
    <collision>
      <origin xyz="-2.2204460492503130808e-16 1.5250000000000001332 -6.9388939039072283776e-18" rpy="1.570796326794896558 -4.6222318665293660473e-33 -5.5511151231257827021e-17" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
      </geometry>
    </collision>
    <inertial>
      <origin xyz="-1.8119986468310394014e-16 0.86258161512027486939 -0.029947488034416908098" rpy="0 0 0"/>
      <mass value="82.278311597516690767" />
      <inertia ixx="21.219064546212177191" ixy="-1.3115094234114289768e-15"  ixz="3.2448260781278849915e-17" iyy="0.32911778625415533117" iyz="-0.58453590065355076622" izz="21.292856017780909639" />
    </inertial>
  </link>

  <joint name="lowerlimb1" type="revolute">
    <origin xyz="8.3266726846886740532e-17 -1.0000000000000004441 3.4694469519536141888e-18" rpy="-3.141592653589793116 7.9073280062811715521e-17 -2.4434609527920607697" />
    <parent link="upperlimb" />
    <child link="lowerlimb" />
    <axis xyz="0 0 1"/>
    <limit effort="1" velocity="20" lower="-2.0943951023931952626" upper="-0.69813170079773179122"/>
    <joint_properties friction="0.0"/>
  </joint>

  <joint name="upperlimb1" type="revolute">
    <origin xyz="0 6.9388939039072283776e-18 -0.1500000000000000222" rpy="1.570796326794896558 0.34906585039886578459 3.141592653589793116" />
    <parent link="shoulder" />
    <child link="upperlimb" />
    <axis xyz="0 0 1"/>
    <limit effort="1" velocity="20" lower="-1.570796326794896558" upper="-0.34906585039886589561"/>
    <joint_properties friction="0.0"/>
  </joint>

  <joint name="shoulder1" type="revolute">
    <origin xyz="0.3638696238398552163 0.030409909784793860699 0.15190468430519105114" rpy="3.141592653589793116 -0 0" />
    <parent link="torso_quadruped" />
```

```xml
    <child link="shoulder" />
    <axis xyz="0 0 1"/>
    <limit effort="1" velocity="20" lower="-0.785398163397448279" upper="0.785398163397448279"/>
    <joint_properties friction="0.0"/>
    </joint>

    <link name="shoulder_2">
    <visual>
    <origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
    <geometry>
    <mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
    </geometry>
    <material name="shoulder_material">
    <color rgba="0.6156862745098039546 0.8117647058823529437 0.92941176470588238168 1.0"/>
    </material>
    </visual>
    <collision>
    <origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
    <geometry>
    <mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
    </geometry>
    </collision>
    <inertial>
    <origin xyz="-3.7347681414163801479e-19 0.027929396093619211772 -0.095649350649350664555" rpy="0 0 0"/>
    <mass value="10.885618544688634657" />
    <inertia ixx="0.067417122752900543459" ixy="0"  ixz="0" iyy="0.075908462192995490581" iyz="0.0092341600956555008189" izz="0.043109319895117424737" />
    </inertial>
    </link>

    <link name="upperlimb_2">
    <visual>
    <origin xyz="-5.5511151231257827021e-17 5.5511151231257827021e-17 0" rpy="1.570796326794896558 -1.5407439555097886824e-32 0" />
    <geometry>
    <mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
    </geometry>
    <material name="upperlimb_material">
    <color rgba="0.6156862745098039546 0.8117647058823529437 0.92941176470588238168 1.0"/>
    </material>
    </visual>
    <collision>
    <origin xyz="-5.5511151231257827021e-17 5.5511151231257827021e-17 0" rpy="1.570796326794896558 -1.5407439555097886824e-32 0" />
    <geometry>
    <mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
    </geometry>
    </collision>
    <inertial>
    <origin xyz="-5.7955123816119879979e-17 -0.5 -0.041859986609857721684" rpy="0 0 0"/>
    <mass value="48.066367599923843557" />
    <inertia ixx="5.204489452505125513" ixy="0"  ixz="9.6484965380956476748e-32" iyy="0.15045227104254321748" iyz="0" izz="5.2887141526857410767" />
    </inertial>
    </link>

    <link name="lowerlimb_2">
    <visual>
    <origin xyz="0 1.5249999999999999112 0" rpy="1.570796326794896558 3.8518598887744717061e-33 0" />
    <geometry>
    <mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
    </geometry>
```

```xml
<material name="lowerlimb_material">
<color rgba="0.6156862745098035466 0.81176470588235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="0 1.5249999999999999112 0" rpy="1.570796326794896558 3.8518598887744717061e-33 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="4.0731331005033972738e-18 0.86258161512027475837 -0.029947488034416901159" rpy="0 0 0"/>
<mass value="82.278311597516690767" />
<inertia ixx="21.219064546212177191" ixy="-1.1534501519517242268e-16"  ixz="1.3151159122921389015e-31" iyy="0.32911778625415522015" iyz="-0.58453590065355065519" izz="21.292856017780909639" />
</inertial>
</link>

<joint name="lowerlimb2" type="revolute">
<origin xyz="5.5511151231257827021e-17 -1 -6.9388939039072283776e-18" rpy="-3.141592653589793116 7.9073280062811740173e-17 -2.4434609527920607697" />
<parent link="upperlimb_2" />
<child link="lowerlimb_2" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-2.0943951023931952626" upper="-0.69813170079773179122"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="upperlimb2" type="revolute">
<origin xyz="0 6.9388939039072283776e-18 -0.1500000000000000222" rpy="1.570796326794896558 0.34906585039886578459 3.141592653589793116" />
<parent link="shoulder_2" />
<child link="upperlimb_2" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-1.570796326794896558" upper="-0.34906585039886589561"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="shoulder2" type="revolute">
<origin xyz="-0.036130376160144812847 0.43040990978479387596 0.15190468430519105114" rpy="3.141592653589793116 -0 1.570796326794896558" />
<parent link="torso_quadruped" />
<child link="shoulder_2" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-0.785398163397448279" upper="0.785398163397448279"/>
<joint_properties friction="0.0"/>
</joint>

<link name="shoulder_3">
<visual>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
</geometry>
<material name="shoulder_material">
<color rgba="0.6156862745098035466 0.81176470588235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
```

```xml
      </geometry>
    </collision>
    <inertial>
      <origin xyz="-3.7347681414163801479e-19 0.027929396093619211772 -0.095649350649350664555" rpy="0 0 0"/>
      <mass value="10.885618544688634657" />
      <inertia ixx="0.067417122752900543459" ixy="0"  ixz="0" iyy="0.075908462192995490581" iyz="0.0092341600956555008189" izz="0.043109319895117424737" />
    </inertial>
  </link>

  <link name="upperlimb_3">
    <visual>
      <origin xyz="2.7755575615628913511e-17 1 0" rpy="1.570796326794896558 -6.1629758220391547298e-33 0" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
      </geometry>
      <material name="upperlimb_material">
        <color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
      </material>
    </visual>
    <collision>
      <origin xyz="2.7755575615628913511e-17 1 0" rpy="1.570796326794896558 -6.1629758220391547298e-33 0" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
      </geometry>
    </collision>
    <inertial>
      <origin xyz="2.5311603030766860552e-17 0.49999999999999983347 -0.041859986609857721684" rpy="0 0 0"/>
      <mass value="48.066367599923843557" />
      <inertia ixx="5.204489452505125513" ixy="0"  ixz="8.0966468840864658699e-32" iyy="0.15045227104254321748" iyz="0" izz="5.2887141526857410767" />
    </inertial>
  </link>

  <link name="lowerlimb_3">
    <visual>
      <origin xyz="2.2204460492503130808e-16 1.5249999999999999112 0" rpy="1.570796326794896558 -0 -5.5511151231257827021e-17" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
      </geometry>
      <material name="lowerlimb_material">
        <color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
      </material>
    </visual>
    <collision>
      <origin xyz="2.2204460492503130808e-16 1.5249999999999999112 0" rpy="1.570796326794896558 -0 -5.5511151231257827021e-17" />
      <geometry>
        <mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
      </geometry>
    </collision>
    <inertial>
      <origin xyz="2.6288934516695870068e-16 0.86258161512027475837 -0.029947488034416901159" rpy="0 0 0"/>
      <mass value="82.278311597516690767" />
      <inertia ixx="21.219064546212177191" ixy="-1.3115094234114289768e-15"  ixz="3.2448260781278683515e-17" iyy="0.32911778625415533117" iyz="-0.58453590065355076622" izz="21.292856017780909639" />
    </inertial>
  </link>

  <joint name="lowerlimb3" type="revolute">
    <origin xyz="2.7755575615628913511e-17 1.000000000000000222 -6.9388939039072283776e-18" rpy="3.141592653589793116 4.3391399851923562056e-17 0.69813170079773245735" />
    <parent link="upperlimb_3" />
```

```xml
<child link="lowerlimb_3" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-2.0943951023931952626" upper="-0.69813170079773179122"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="upperlimb3" type="revolute">
<origin xyz="-5.5511151231257827021e-17 6.9388939039072283776e-18 -0.15000000000000007772" rpy="-1.570796326794896558 -0.34906585039886578459 6.5162095139319294904e-17" />
<parent link="shoulder_3" />
<child link="upperlimb_3" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-1.570796326794896558" upper="-0.34906585039886589561"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="shoulder3" type="revolute">
<origin xyz="-0.036130376160144798969 -0.36959009021520616844 0.15190468430519105114" rpy="3.141592653589793116 -0 -1.570796326794896558" />
<parent link="torso_quadruped" />
<child link="shoulder_3" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-0.785398163397448279" upper="0.785398163397448279"/>
<joint_properties friction="0.0"/>
</joint>

<link name="shoulder_4">
<visual>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
</geometry>
<material name="shoulder_material">
<color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="0 6.9388939039072283776e-18 0" rpy="3.141592653589793116 -0 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/shoulder.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="-3.7347681414163801479e-19 0.027929396093619211772 -0.095649350649350664555" rpy="0 0 0"/>
<mass value="10.885618544688634657" />
<inertia ixx="0.067417122752900543459" ixy="0"  ixz="0" iyy="0.075908462192995490581" iyz="0.0092341600956555008189" izz="0.043109319895117424737" />
</inertial>
</link>

<link name="upperlimb_4">
<visual>
<origin xyz="0 1 -3.4694469519536141888e-18" rpy="1.570796326794896558 -6.1629758220391547298e-33 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
</geometry>
<material name="upperlimb_material">
<color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
```

```xml
<origin xyz="0 1 -3.4694469519536141888e-18" rpy="1.570796326794896558 -6.1629758220391547298e-33 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/upperlimb.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="-2.4439725848620537286e-18 0.49999999999999983347 -0.041859986609857721684" rpy="0 0 0"/>
<mass value="48.066367599923843557" />
<inertia ixx="5.204489452505125513" ixy="0"  ixz="8.0966468840864658699e-32" iyy="0.15045227104254321748" iyz="0" izz="5.2887141526857410767" />
</inertial>
</link>

<link name="lowerlimb_4">
<visual>
<origin xyz="0 1.5249999999999999112 0" rpy="1.570796326794896558 6.1629758220391547298e-33 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
</geometry>
<material name="lowerlimb_material">
<color rgba="0.61568627450980395466 0.81176470588235294379 0.92941176470588238168 1.0"/>
</material>
</visual>
<collision>
<origin xyz="0 1.5249999999999999112 0" rpy="1.570796326794896558 6.1629758220391547298e-33 0" />
<geometry>
<mesh filename="package://quadruped_description/quadruped/lowerlimb.stl"/>
</geometry>
</collision>
<inertial>
<origin xyz="4.0731331005033972738e-18 0.86258161512027475837 -0.029947488034416901159" rpy="0 0 0"/>
<mass value="82.278311597516690767" />
<inertia ixx="21.219064546212177191" ixy="-1.1534501519517242268e-16"  ixz="4.5477505515078708538e-34" iyy="0.32911778625415522015" iyz="-0.58453590065355065519" izz="21.292856017780909639" />
</inertial>
</link>

<joint name="lowerlimb4" type="revolute">
<origin xyz="2.7755575615628913511e-16 0.99999999999999988898 3.4694469519536141888e-18" rpy="3.141592653589793116 4.339139985192361136e-17 0.69813170079773234633" />
<parent link="upperlimb_4" />
<child link="lowerlimb_4" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-2.0943951023931952626" upper="-0.69813170079773179122"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="upperlimb4" type="revolute">
<origin xyz="-5.5511151231257827021e-17 6.9388939039072283776e-18 -0.14999999999999985567" rpy="-1.570796326794896558 -0.34906585039886578459 6.5162095139319294904e-17" />
<parent link="shoulder_4" />
<child link="upperlimb_4" />
<axis xyz="0 0 1"/>
<limit effort="1" velocity="20" lower="-1.570796326794896558" upper="-0.34906585039886589561"/>
<joint_properties friction="0.0"/>
</joint>

<joint name="shoulder4" type="revolute">
<origin xyz="-0.4361303761601482811 0.030409909784793846821 0.15190468430519105114" rpy="3.141592653589793116 -0 3.141592653589793116" />
<parent link="torso_quadruped" />
<child link="shoulder_4" />
<axis xyz="0 0 1"/>
```

```
<limit effort="1" velocity="20" lower="-0.785398163397448279" upper="0.785398163397448279"/>
<joint_properties friction="0.0"/>
</joint>


</robot>
```

- END CODE -

- **NOTE** that it has the inertia calculated based on the material assigned to each part in the Onshape CAD software, handy for simulation.

16/11/2023