URDF(unified robot description format) Files

- Similar to xml files
- Used to specify the environment specifications of a robot like the axis color, background settings, light conditions, camera specifications, etc.
- SDF files give more specific environment settings
- Urdf has one root tag called the robot which has 1 attribute I.e., name

- Joints : define the relationship between the origin or the coordinate frames of the links which defines the position & rotation of each link in space
- Each link has a corresponding joint

- Types of joints :
    - Revolute : has fixed limits, Eg.:arm
    - Continuous : no fixed limits, Eg.: wheel, spinning gripper
    - Prismatic : moves along a linear path, Eg.: linear actuater
    - Fixed

URDF file format :

<?xml version="1.0"?>

<robot name = "robot">

<link name="link">

<visual>

<geometry>   //overall shape is specified

//specify the shape or give path to the 3d mesh

```
<origin>

<material>   //set colour

//rgb values or reference to name already being set before

</visual>


<collision>   //used for physics collision calculations

<geometry>

<origin>

</collisoin>


<inertial>     //used for physics calculations

<mass>

<origin>

<inertia>

</inertial>

</link>



<join name="join" type="specify_type">

<parent link="link"/>

<child link="link"/>

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

//above 3 enough for a fixed joint
```

```
<axis xyz = "0 -1 0"/>        //specifies about which axis the arm moves

<limit lower = "0" upper="1" velocity = "100" effort = "100"/>

</join>
```

//-y : upward rotation

References :

Urdf : https://articulatedrobotics.xyz/ready-for-ros-7-urdf/

Urdf visualization : https://gkjohnson.github.io/urdf-loaders/javascript/example/bundle/index.html