Ramp Follower Robot- II

What is our GOAL for this CLASS?

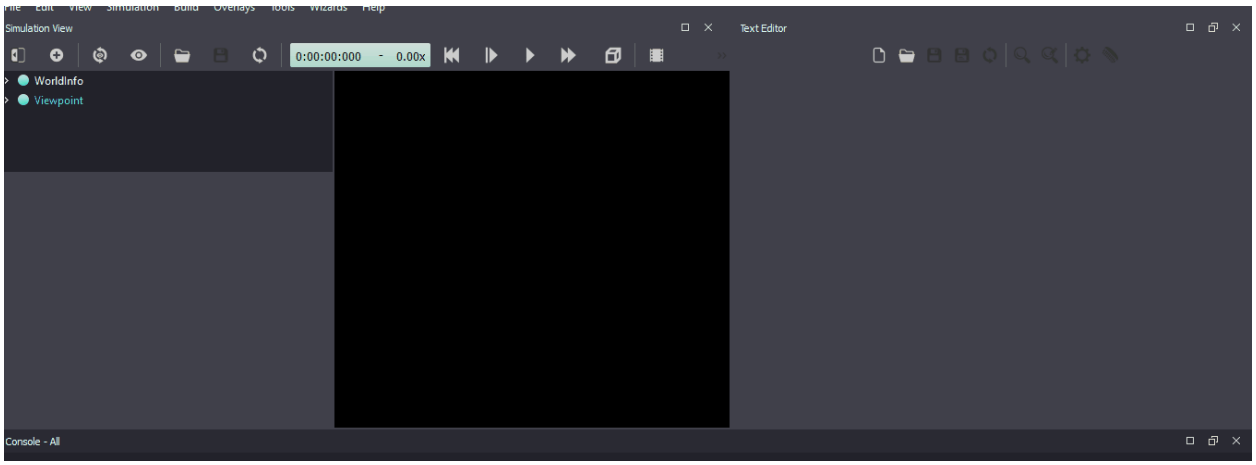
In this class, we designed wheels for the follower Robot.We used hinge joints, Motors along with Wheels. We made left and right wheels for the Robot and installed a Hinge joint to mount motors and used a position sensor to align with wheels.

What did we ACHIEVE in the class TODAY?

- We made Wheels
- We designed Hinge Joint
- We learned about Rotational Motors

How did we DO the activities?

1. Open the Follower Ramp file.



https://s3-whjr-curriculum-uploads.whjr.online/efe2e800-1c83-4d97-bc8d-14fd8a3288cf.gif

2. **Teams related to Webots:**

- **HingeJoint :** The HingeJoint is a joint which allows a rotational motion around a given axis. It will use a device like Rotational Motor, a position sensor inside it. If no device then it will act as a simple joint.

3. Procedure for Left Wheel

1. Click on **transform**
2. Click on **+**
3. Select **Base nodes**
4. Click **Base nodes drop down**

    a. Select **HingeJoint**

    b. Click **Add**

    c. Now Double click on Hinge joint Select **Select JointParametersNull**

    d. Double click on **JointParamtersNull and select Hinge Joint Parameters**

    e. Click **Add**

    f. click on drop down of **Hinge Joint Parameters**

        i. Select **position 0**

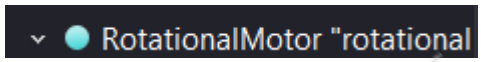
ii. Select **axis 0, 1, 0**

iii. Select **anchor 0, 0, 0.025**

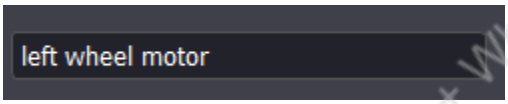
g. Double Click **on device** 

h. Select **Rotational Motor** under Base nodes

i. Click **Add**

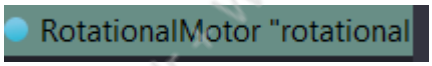
j. **Click on drop down of** 

i. **Write name “left wheel motor”**



ii. **Set consumption factor 70**

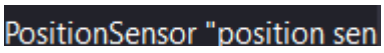
Note : Repeat the device step again to set the position sensor .

k. Click on 

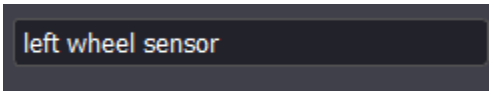
l. Click on **+**

m. Select **Position Sensor** under Base nodes

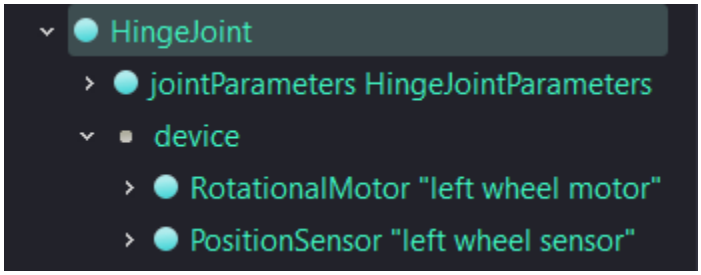
n. Click **Add**

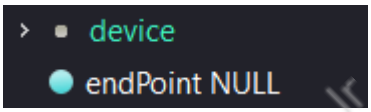
o. Click on drop down of 

i. Click on name field and write name **“left wheel sensor”**



Scene Tree will look like this:



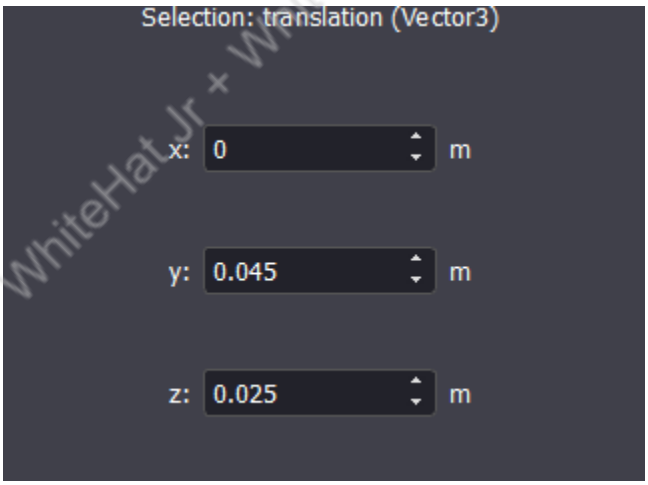
p. Now close the **Drop down of** 

q. Double Click on **endPoint PointNull**

r. Select **solid** under Base nodes

s. Click on **Add**

i. Select **translation 0, 0.045, 0.025**



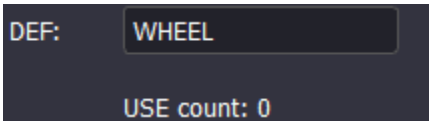
ii. Select **Rotation -0.6, 0.6, 0.53, 4.12** Write name **“left wheel”**

iii. Double Click **on children**

iv. Select **transform under Base nodes**

v. **Click Add**

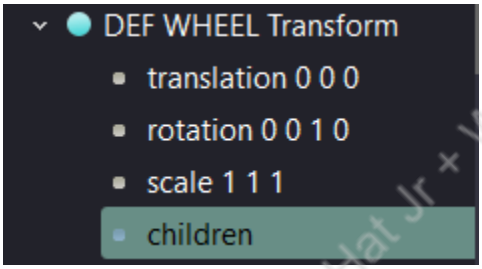
vi. **Write the name of DEF function "WHEEL"**



vii. Click on drop down of 

viii. Set **Rotation 0.5778, 0.577 -0.577, -2.09**

ix. Click on **children under** 



x. **Double Click on children**

xi. **Select** Shape **under Base nodes**

xii. Click **Add**

xiii. Double click on drop down of **Shape**

1. Double Click on **Appearance**
2. **Select PBR Appearance**
3. **Click Add**
4. **Set base color 1 , 0, 0**

Note : Color can be selected from ColourBox too as per student wish.If not then use default one

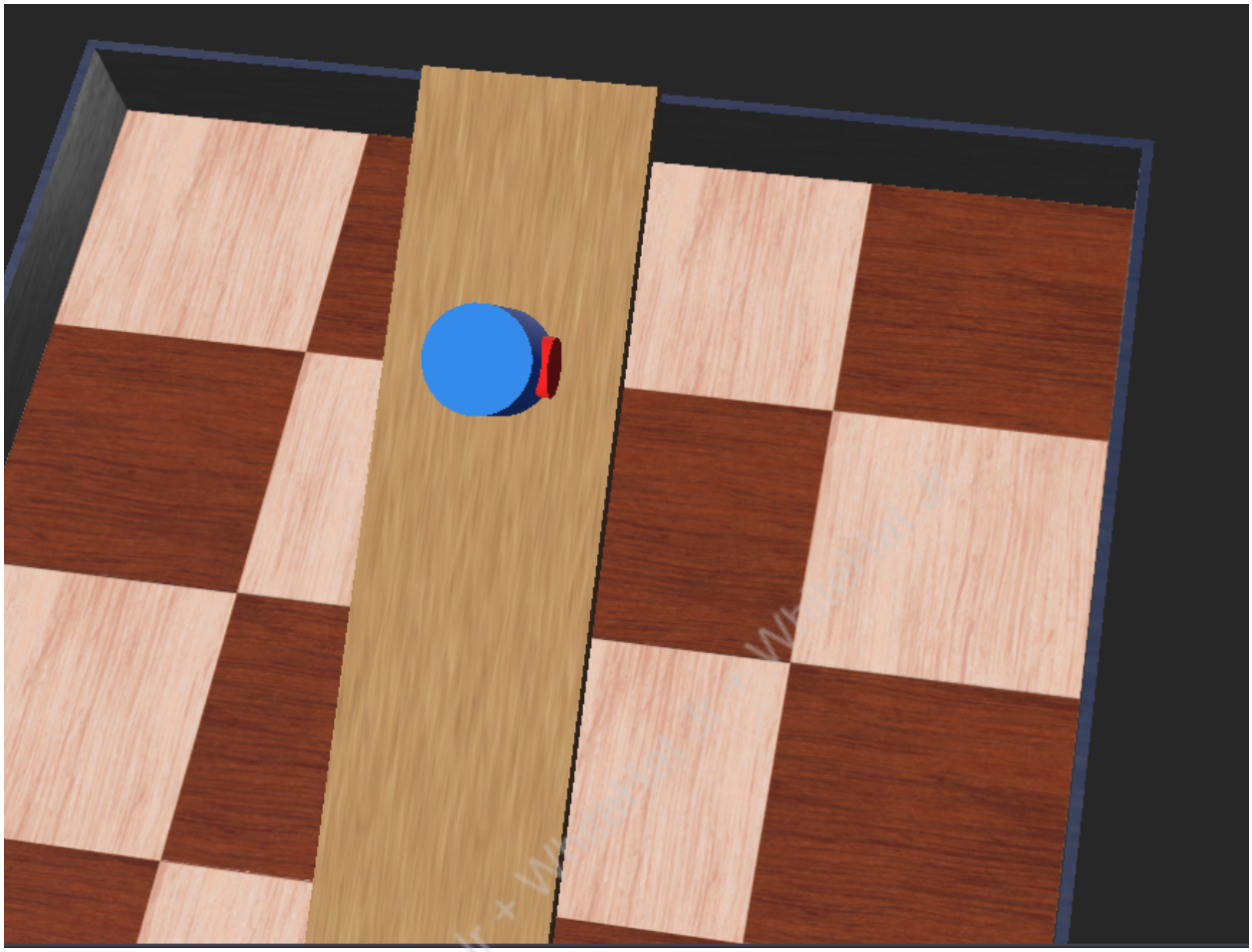
5. **Set Roughness 1**

6. **Set metalness 0**
7. Under **Appearance** there is **Geometry Null.** Double Click on **geometry Null**
8. Select **Cylinder under Base nodes**
9. Click **Add**
    a. Set **Height 0.01**
    b. Set **Radius 0.025**

xv. Set translation Step 0.01

Rotation Step 0.262

Save the simulation. 



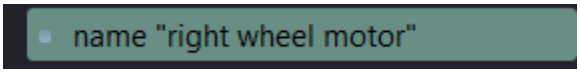
4. **Procedure for right wheel**

Let's change some translational and Rotational settings to set the wheel.

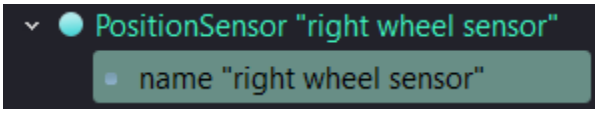
1. Go to the devices
2. Click on Drop Down Rotational Devices

Note: You will see left wheel motor, bus as this is right wheel we need to change the name.

3. Go to the name option and write "right wheel motor"

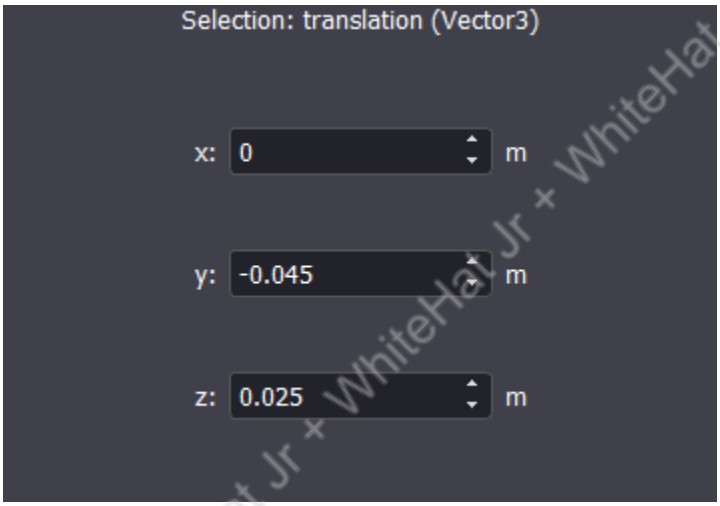


4. Do the same settings for **PositionSensor**

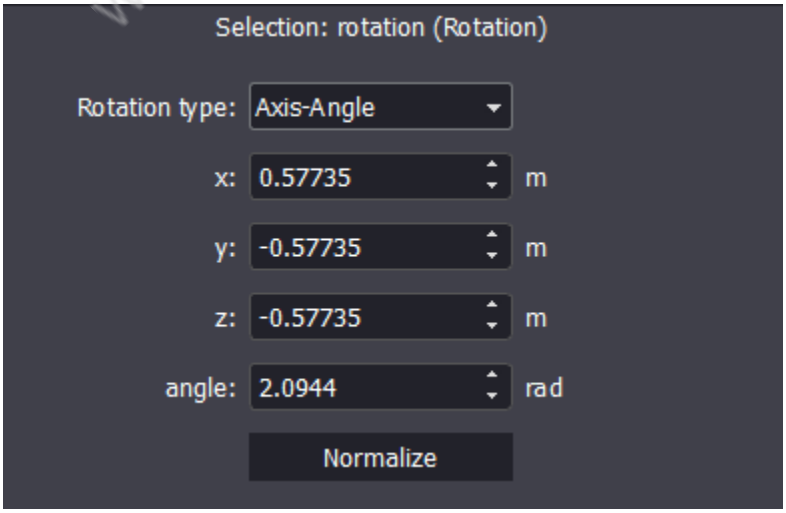


5. Write the “right wheel sensor”

6. Change translation settings:

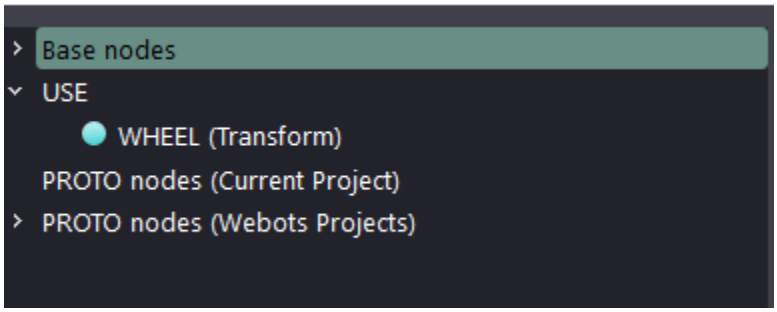


7. Set Rotation



8. Double click on **children** under **endpoint Solid**

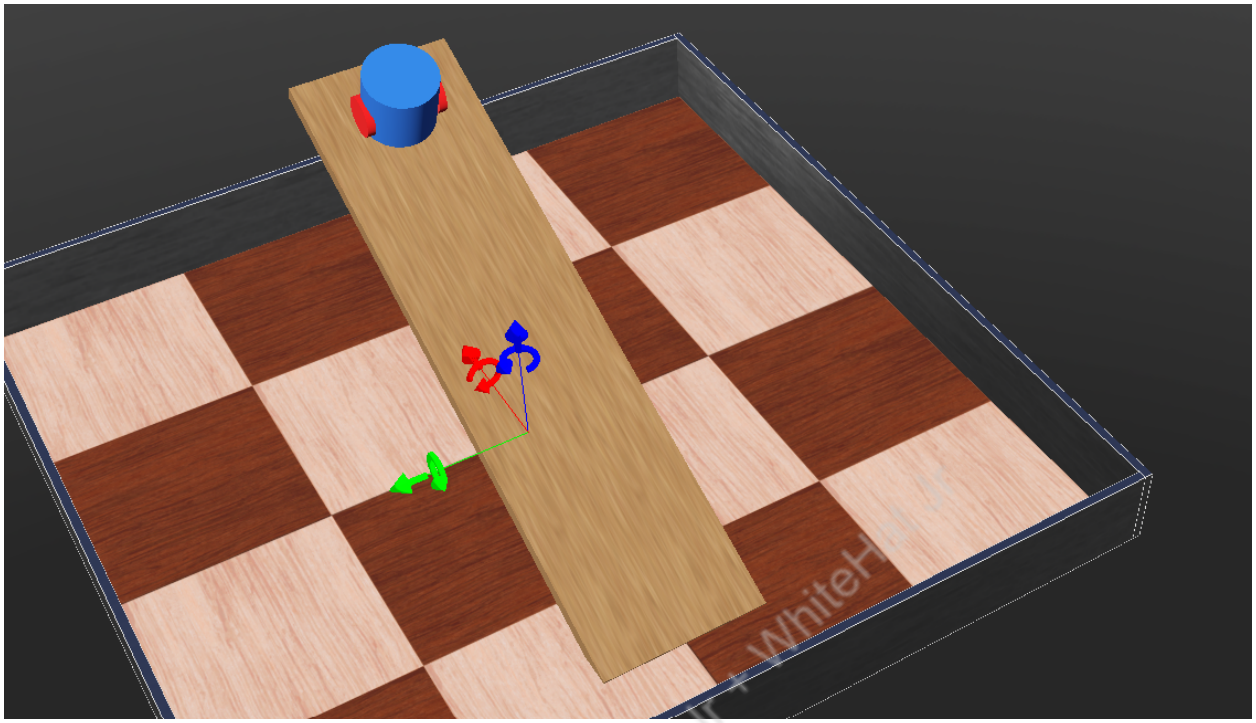
9. Click on **Use and** Select **WHEEL (Transform)**



10. Click on **Add**

11. Translational and Rotational Step setting will remain same

Save the simulation.



What's NEXT?

In the **next class**, we will learn to design robots' faces and install Distance sensors.

Expand Your Knowledge

To know more about **HingeJoint** click here.