

Advanced Graphics

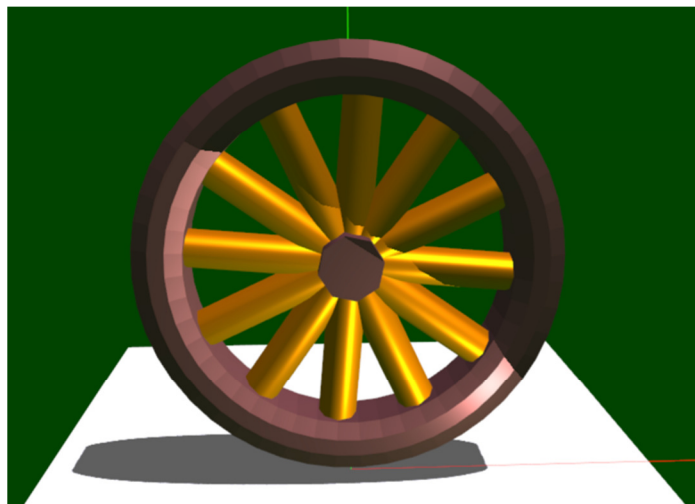
Lab 5 – Using extrude geometry

Maximum points: 10

Due: At the end of the lab (demonstration only)

Objective for this lab:

- To be cultivate spatial reasoning.
- To build a moderately complex (at least relatively so far) threejs application to display a medieval wheel. Use your own colors and material. Avoid **THREE.MeshPhongMaterial** material.
- Do all the assigned problems on your own.



Tasks:

1 Mark

You will use your own template for a threejs application.

There is a new base to start your application with. It contains an axis-helper, a plane, a cube, a directional and a hemisphere light. There is even a controller setup to toggle rotation of scene

One mark for esthetics

It is recommended that you use a **THREE.Object3D** object as your container.

2 Marks

The outer geometry in the screenshot is not a **Torus** but an extruded geometry! To extrude you need to start with a **THREE.Shape** object and then compose the shape that you want.

4 Marks

The 12 spokes. These are cylinders that are flattened by scaling by greater than one in the z-direction. After creating the first spoke, to speed up coding, you may clone it and simply change the angle of rotation for the next eleven.

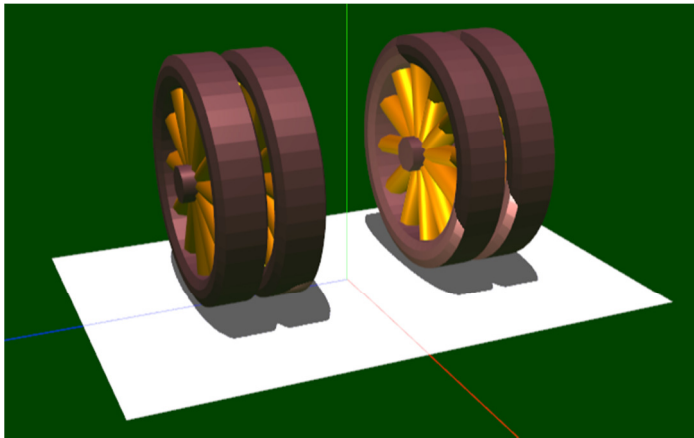
1 Mark

The inner axle. This is a cylinder that is rotated in the x-direction.

1 Mark

Embed the above code in a function. This function will require you to specify outer radius, inner radius and the axle radius. Call the function multiple times to create an interesting model. See the diagram below.

<https://threejs.org/docs/index.html#api/en/geometries/ExtrudeGeometry>



Appendices:

Javascript code

```
//declare a variable to drive the rotation  
let angle = 0;  
  
//in the render function  
scene.rotation.y = angle += 0.1;
```