

CS460 Fall 2022

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## Assignment 3: Three.js Cubes ... and other geometries

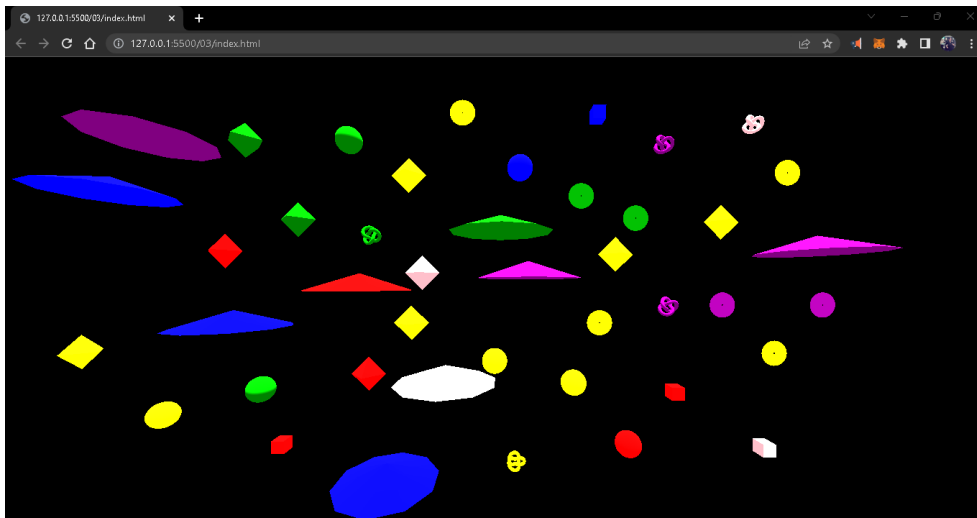
We will use Three.js to create multiple different geometries in an interactive fashion.

The goal of this assignment is to create multiple different geometries by clicking in the viewport. This means, rather than moving an existing mesh, we will create new ones in the `window.onclick` or `renderer.domElement.onclick` callback. On each click, our code will randomly choose a different geometry and a random color to place the object at the current mouse position.

We will be using six different geometries. Before we start coding, we want to understand their parameters.

Constructor	Parameters
<b>THREE.BoxGeometry</b>	( width=22, height=22, depth=22 )
<b>THREE.TorusKnotGeometry</b>	( radius=10, tubesize=3, 100, 16 )
<b>THREE.SphereGeometry</b>	( radius=22, height=22, width=22 )
<b>THREE.OctahedronGeometry</b>	( radius= 30 )
<b>THREE.ConeGeometry</b>	( radius = 90, height=30, theta=10 )
<b>THREE.RingGeometry</b>	( inner radius = 1, outerradius = 22, theta = 32 )

this is the result:



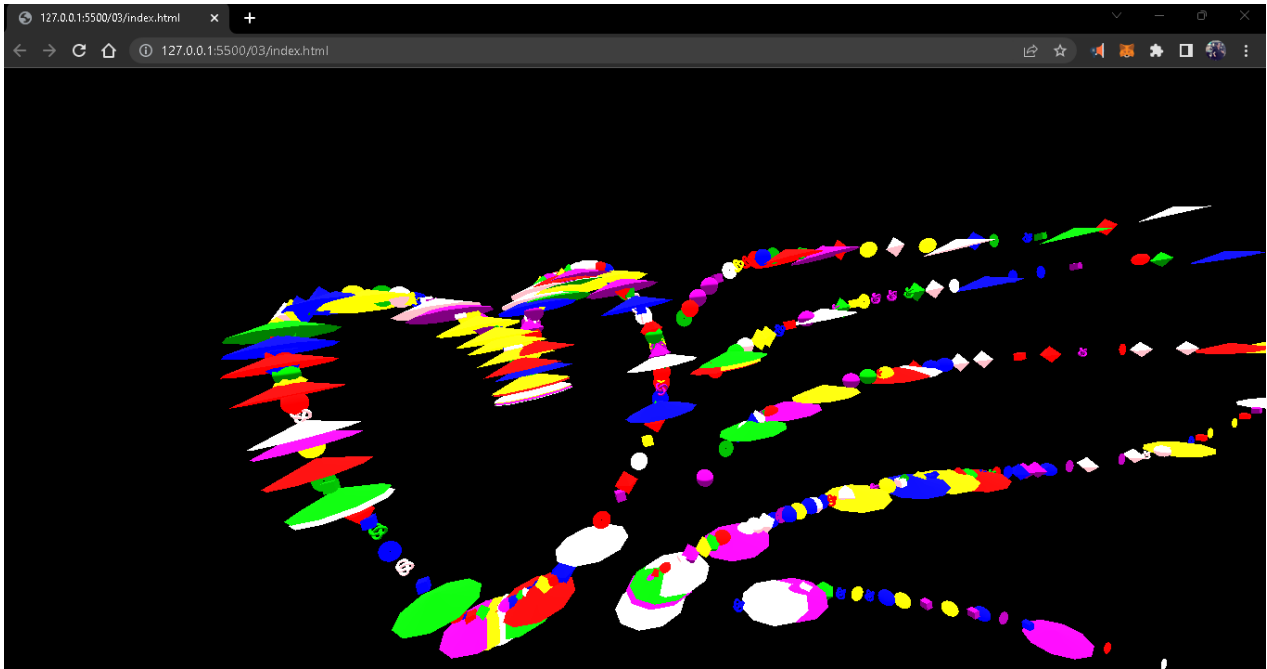
Link to your assignment: <https://dathrika13.github.io/cs460student/>

## Bonus (33 points):

Part 1 (5 points): Do you observe Z-Fighting? If yes, when?

Yes, there is a flickering effect when two faces of the different shapes occupy the same space and fighting to color the screen pixels. This problem is usually caused by limited sub-pixel precision and round-off errors.

Part 2 (10 points): Please change `window.onclick` to `window.onmousemove`. Now, holding SHIFT and moving the mouse draws a ton of shapes.



Part 3 (18 points): Please keep track of the number of placed objects and print the count in the JavaScript console. Now, with the change to `renderer.domElement.onmousemove`, after how many objects do you see a slower rendering performance?

After 3121 objects are placed, I can see a slower performance and also my processor got heated up too.

What happens if the console is not open during drawing?

In the code we used console to view the pixel coordinates and viewport coordinates and total number of objects. We cannot view these parameters if console is not open. Also, when console is not open we can draw in the whole screen space. If we open and close the console the viewport coordinates get minimized and we can draw in that space only.

Can you estimate the total number of triangles drawn as soon as slow-down occurs?

If each object is formed by triangles, roughly after slow down 6-10 shapes are drawn and no more than 1600 triangles can be formed.