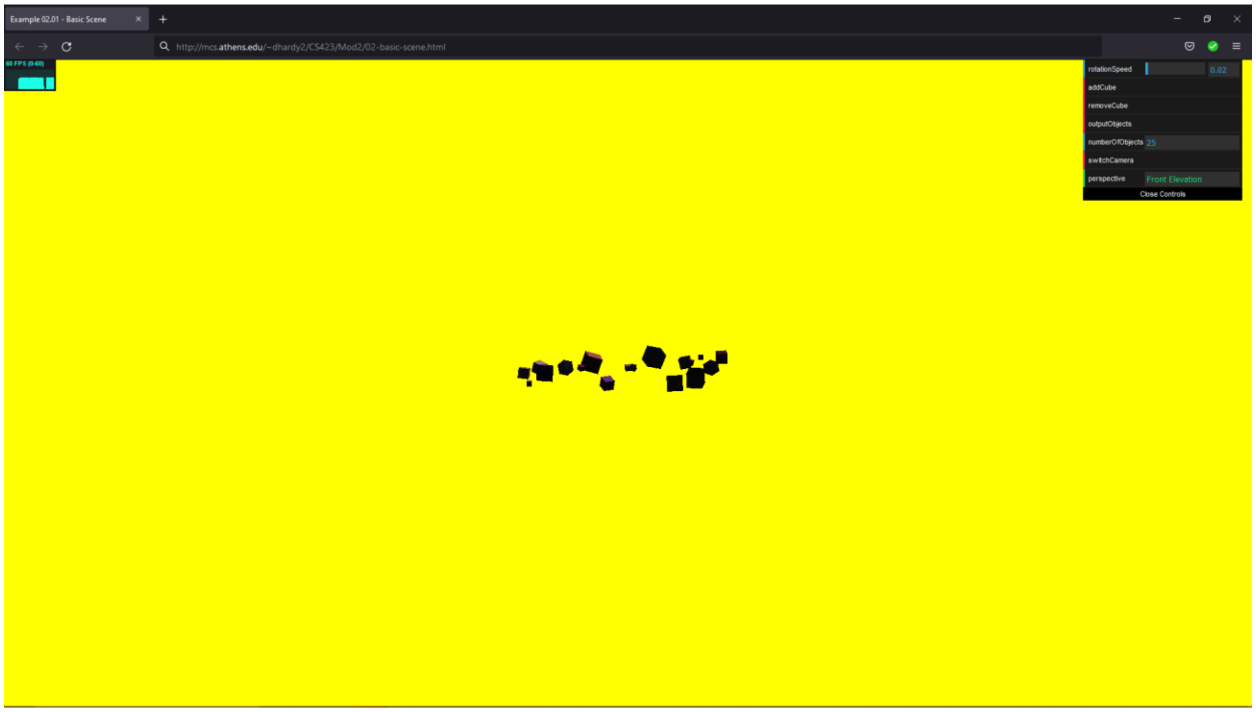
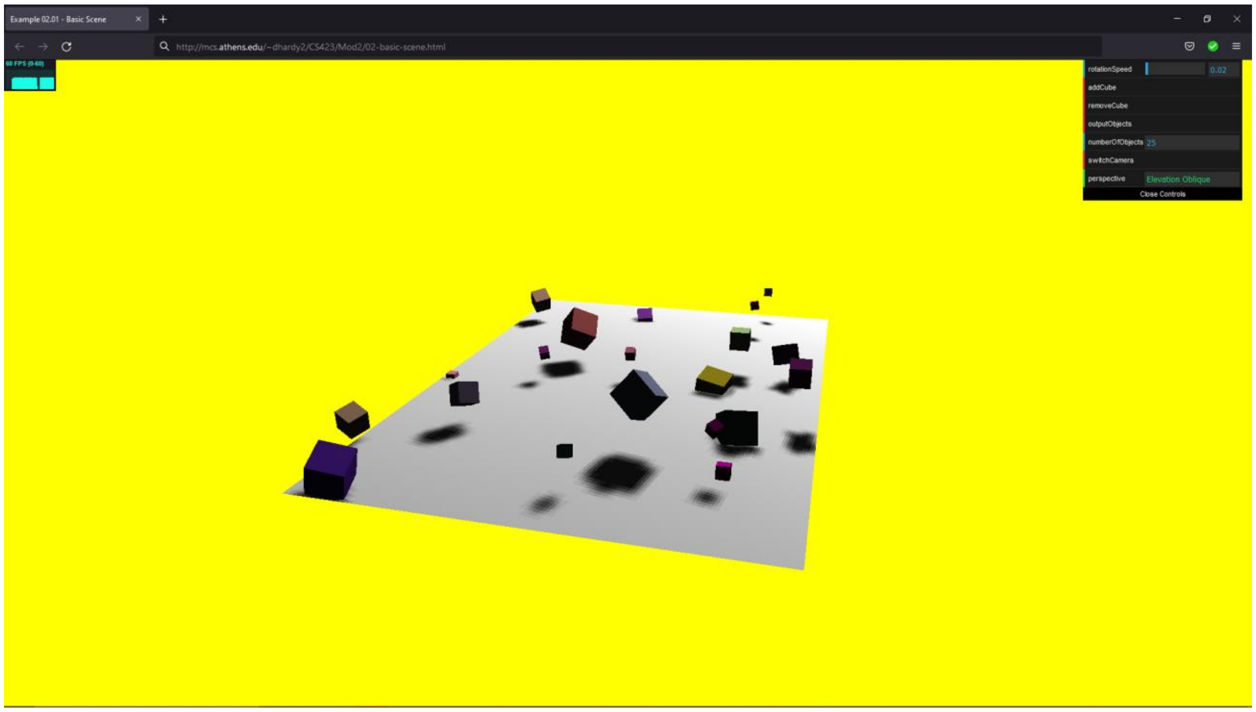
Devin Hardy

00076619

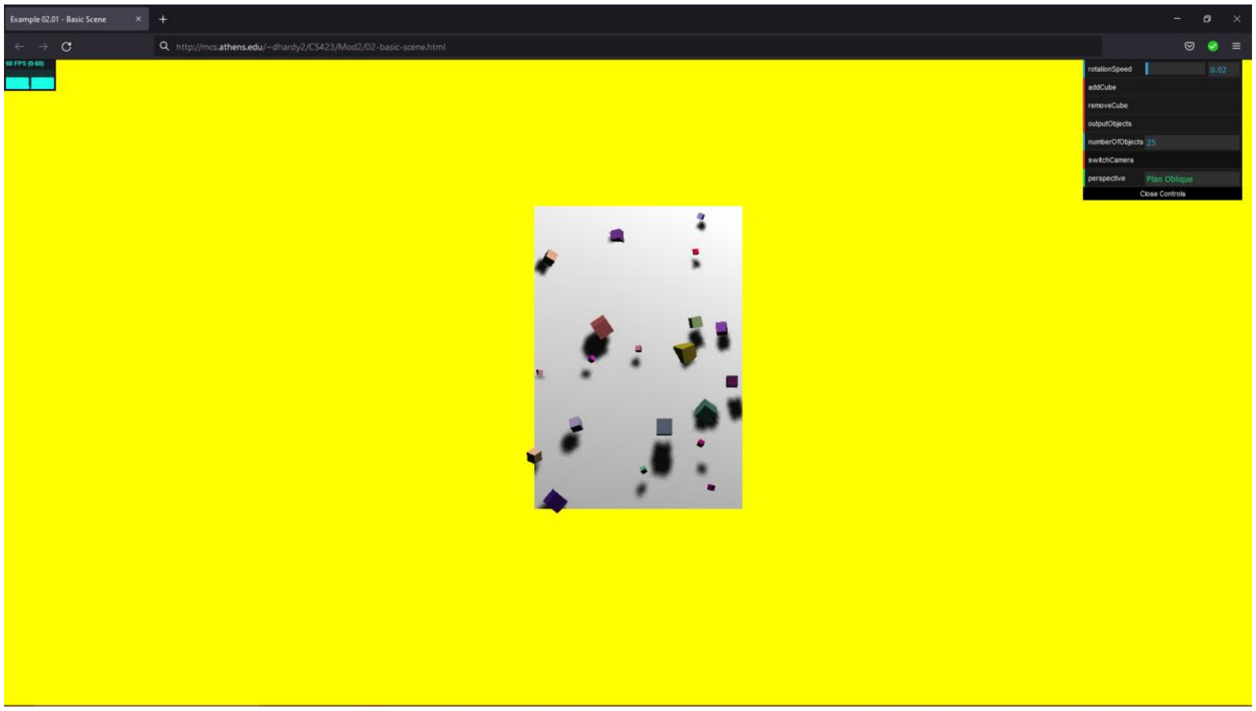
CS423



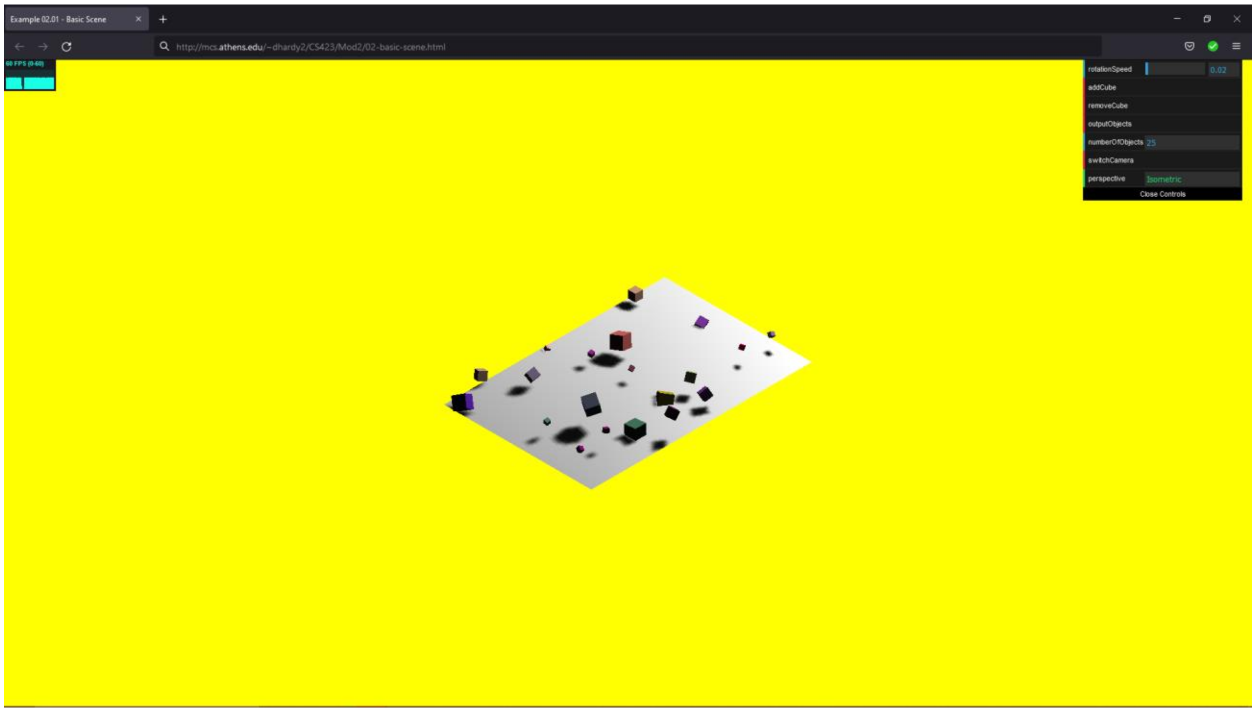
rotationSpeed 0.02
numberOfObjects 25
perspective Front Elevation



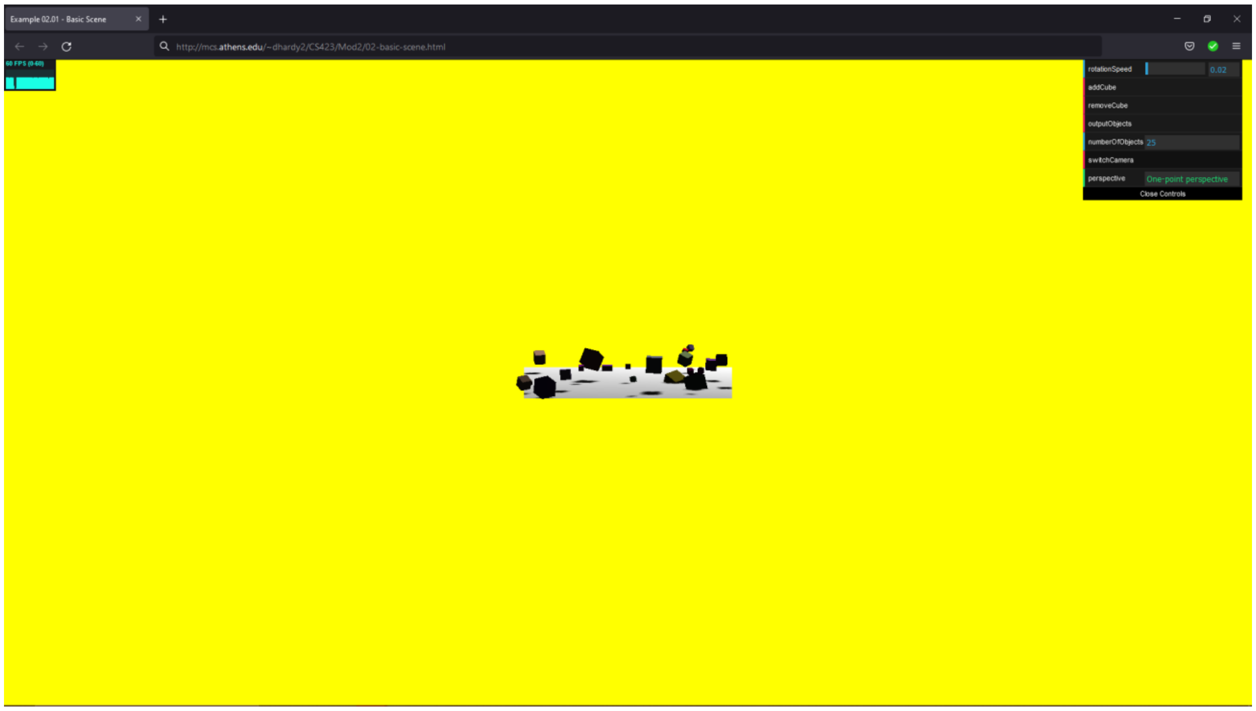
rotationSpeed 0.02
numberOfObjects 25
perspective Elevation Oblique


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-basic-scene.html
60 FPS (0-60)
addCube
removeCube
outputObjects
switchCamera
Close Controls

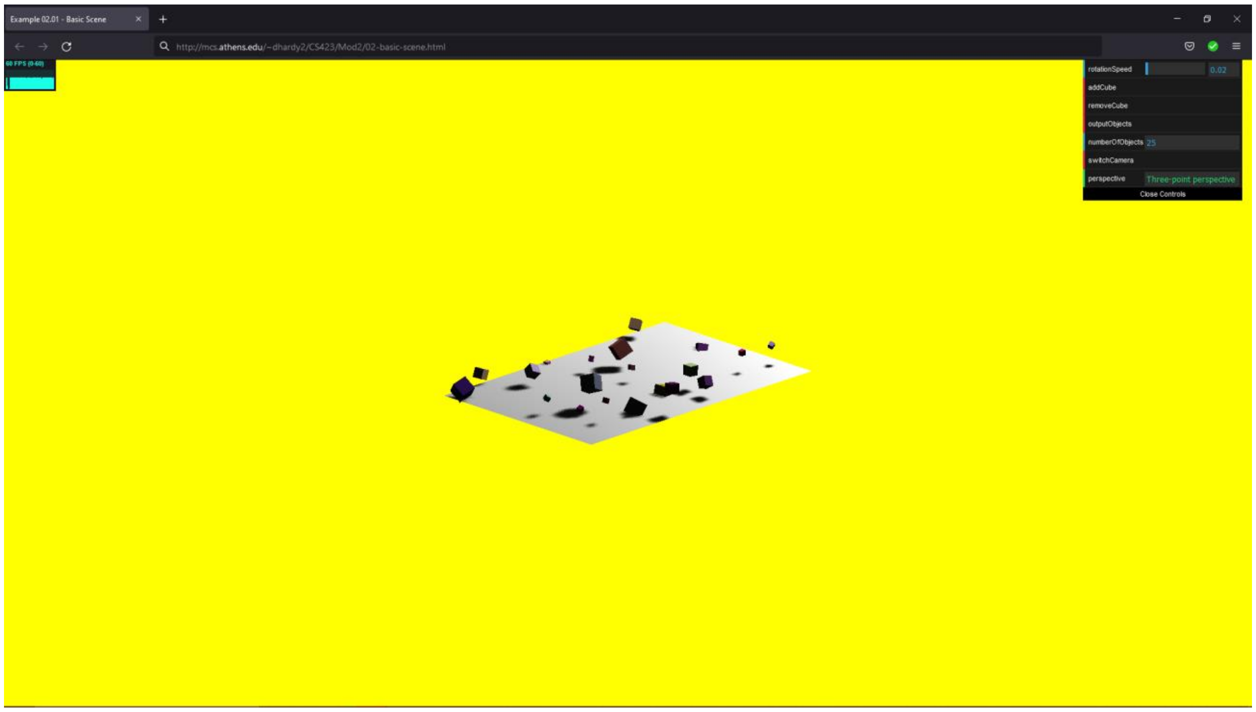
rotationSpeed 0.02
numberOfObjects 25
perspective Plan Oblique


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-basic-scene.html
60 FPS (0-60)
addCube
removeCube
outputObjects
switchCamera
Close Controls

rotationSpeed 0.02
numberOfObjects 25
perspective Isometric


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-basic-scene.html
60 FPS (0-60)
addCube
removeCube
outputObjects
switchCamera
Close Controls

rotationSpeed 0.02
numberOfObjects 25
perspective One-point perspective


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-basic-scene.html
60 FPS (0-60)
addCube
removeCube
outputObjects
switchCamera
Close Controls

rotationSpeed 0.02
numberOfObjects 25
perspective Three-point perspective

Basic Scene

```
<!DOCTYPE html>

<HTML>

<HEAD>
```

```
		<TITLE>Example 02.01 - Basic Scene</TITLE>
		<SCRIPT TYPE="text/javascript" SRC="../libs/three.js"></SCRIPT>
		<SCRIPT TYPE="text/javascript" SRC="../libs/stats.min.js"></SCRIPT>
		<SCRIPT type="text/javascript" src="../libs/dat.gui.min.js"></SCRIPT>
		<style>
			body {
			/* set margin to 0 and overflow to hidden, to go fullscreen */
				margin: 0;
				overflow: hidden;
			}
		</style>
	</head>
	<body>
	<div id="Stats-output">
	</div>
	<!-- Div which will hold the Output -->
	<Div id="WebGL-output">
	</Div>
	<!-- Javascript code that runs our three.js examples -->
	<script type="text/javascript" src="02-basic-scene.js">
	</script>
	</body>
	</HTML>
```

```
	//
	// File: 01-basic-scene.js
	// Demo some of the basics of working with the scenegraph
```

```
// This is an extension of code from he Learning THREE.js textbook
// once everything is loaded. we run our Three.js stuff
function init() {

        var stats = initStats();

        function initStats() {
                var stats = new Stats();

                stats.setMode(0); // 0: fps, 1: ms

                //Align top-left
                stats.domElement.style.position = 'absolute';
                stats.domElement.style.left = '0px';
                stats.domElement.style.top = '0px';
                document.getElementById("Stats-output").appendChild(stats.domElement);
                return stats;
        }

        // create a scene, that will hold all our elements such as objects, cameras and lights.
  var scene = new THREE.Scene();

  // create a camera, which defines where we're looking at.
  var camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1,
1000);
  scene.add(camera);

  // create a render and set the size
  var renderer = new THREE.WebGLRenderer();
```

```
renderer.setClearColor(new THREE.Color(0xEEEEEE, 1.0));

renderer.setSize(window.innerWidth, window.innerHeight);

renderer.shadowMapEnabled = true;


// create the ground plane

var planeGeometry = new THREE.PlaneGeometry(60, 40, 1, 1);

var planeMaterial = new THREE.MeshLambertMaterial({color: 0xffffff});

var plane = new THREE.Mesh(planeGeometry, planeMaterial);

plane.receiveShadow = true;


// rotate and position the plane

plane.rotation.x = -0.5 * Math.PI;

plane.position.x = 0;

plane.position.y = 0;

plane.position.z = 0;


// add the plane to the scene

scene.add(plane);


// add subtle ambient lighting

var ambientLight = new THREE.AmbientLight(0x0c0c0c);

scene.add(ambientLight);


// add spotlight for the shadows

var spotLight = new THREE.SpotLight(0xffffff);

spotLight.position.set(-40, 60, -10);

spotLight.castShadow = true;

scene.add(spotLight);
```

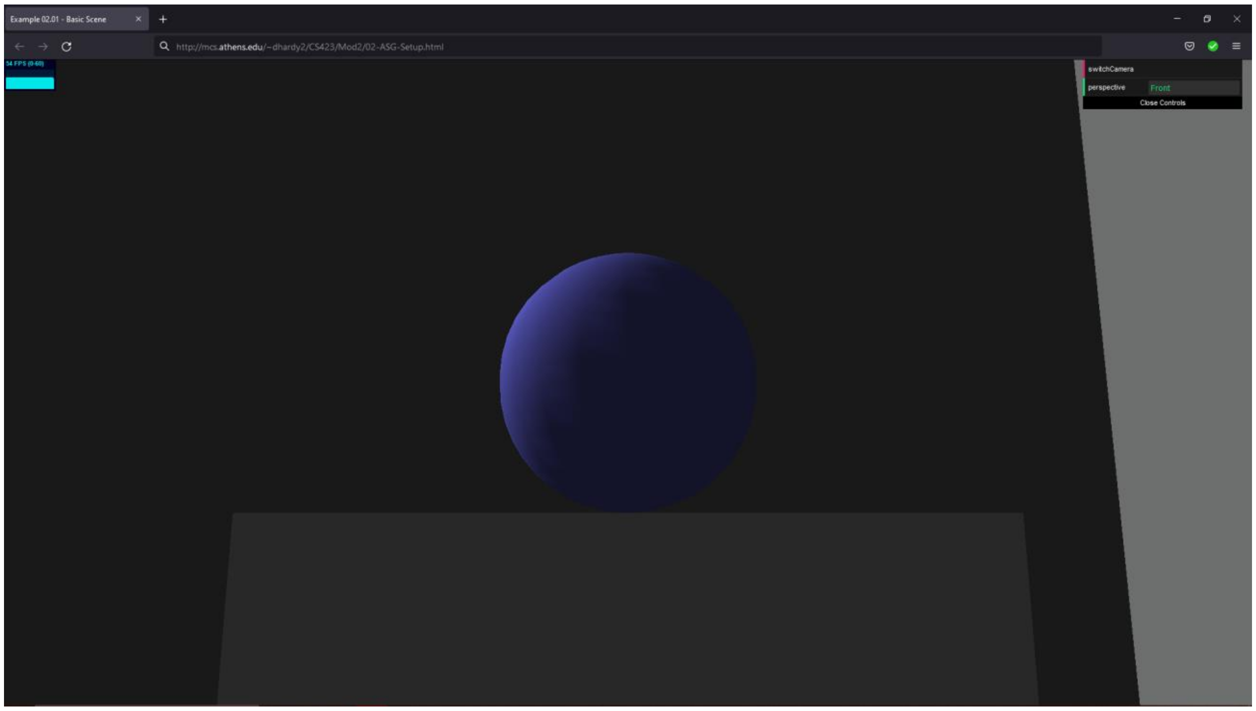
```
// add the output of the renderer to the html element
document.getElementById("WebGL-output").appendChild(renderer.domElement);

// call the render function
var step = 0;


        var camAngle = 0;

var controls = new function () {
    this.rotationSpeed = 0.02;
    this.numberOfObjects = scene.children.length;

    this.removeCube = function () {
        var allChildren = scene.children;
        var lastObject = allChildren[allChildren.length - 1];
        if (lastObject instanceof THREE.Mesh) {
            scene.remove(lastObject);
            this.numberOfObjects = scene.children.length;
        }
    };

    this.addCube = function () {

        var cubeSize = Math.ceil((Math.random() * 3));
        var cubeGeometry = new THREE.BoxGeometry(cubeSize, cubeSize, cubeSize);
        var cubeMaterial = new THREE.MeshLambertMaterial({color: Math.random() * 0xffffff});
        var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);
```

```
            cube.castShadow = true;

            cube.name = "cube-" + scene.children.length;



            // position the cube randomly in the scene


            cube.position.x = -30 + Math.round((Math.random() * planeGeometry.parameters.width));

            cube.position.y = Math.round((Math.random() * 5));

            cube.position.z = -20 + Math.round((Math.random() * planeGeometry.parameters.height));


            // add the cube to the scene

            scene.add(cube);

            this.numberOfObjects = scene.children.length;

        };


        this.outputObjects = function () {

            console.log(scene.children);

        }



                        // Camera Change

                        this.perspective = "Perspective";

                        this.switchCamera = function () {

                                    if (camAngle == 0) {

                                                camAngle = 1;

                                                camera = new THREE.OrthographicCamera(window.innerWidth / -16,
window.innerWidth / 16, window.innerHeight / 16, window.innerHeight / -16, -200, 500);

                                                camera.position.x = 20;

                                                camera.position.y = 0;
```

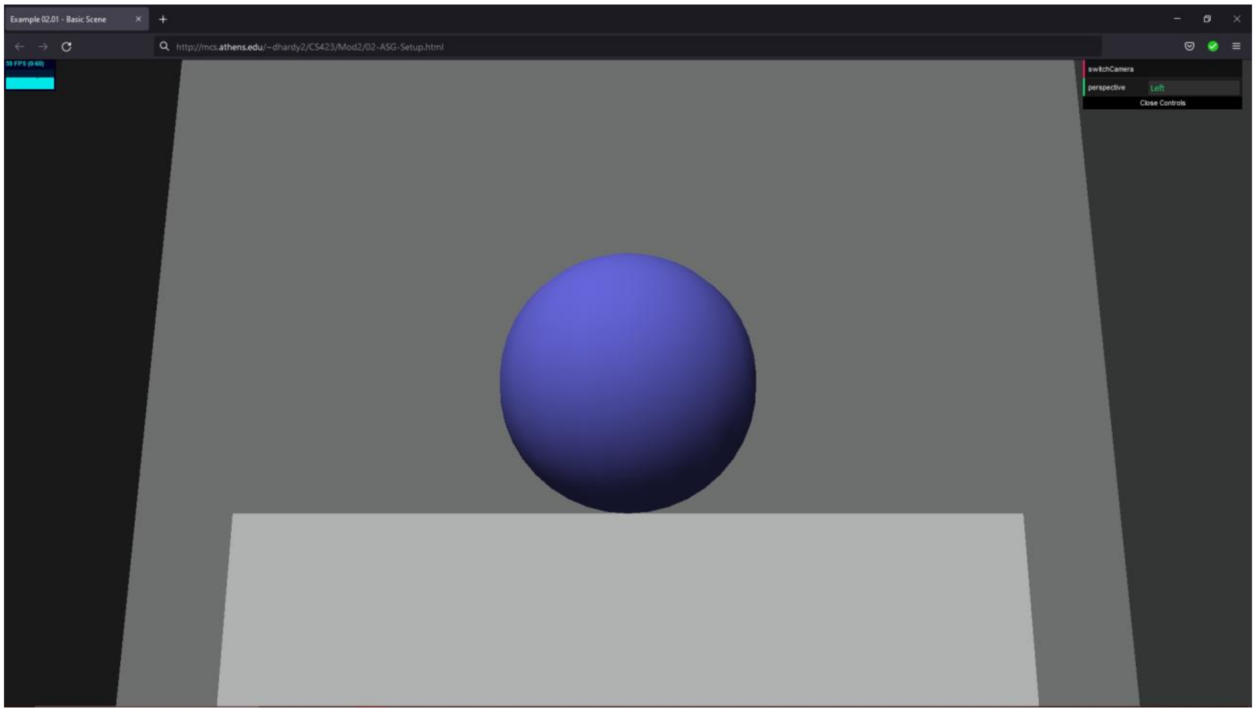
```
                                        camera.position.z = 0;

                                        camera.lookAt(scene.position);

                                        this.perspective = "Front Elevation";

                              } else if (camAngle == 1) {

                                        camAngle = 2;

                                        camera = new THREE.PerspectiveCamera(45, window.innerWidth /
window.innerHeight, 0.1, 1000);

                                        camera.position.x = 75;

                                        camera.position.y = 30;

                                        camera.position.z = -20;

                                        camera.lookAt(scene.position);

                                        this.perspective = "Elevation Oblique";

                              } else if (camAngle == 2) {

                                        camAngle = 3;

                                        camera = new THREE.OrthographicCamera(window.innerWidth / -16,
window.innerWidth / 16, window.innerHeight / 16, window.innerHeight / -16, -200, 500);

                                        camera.position.x = 5;

                                        camera.position.y = 20;

                                        camera.position.z = 0;

                                        camera.lookAt(scene.position);

                                        camera.position.x = 10;

                                        camera.position.z = 2;


                                        this.perspective = "Plan Oblique";

                              } else if (camAngle == 3) {

                                        camAngle = 4;

                                        camera = new THREE.OrthographicCamera(window.innerWidth / -16,
window.innerWidth / 16, window.innerHeight / 16, window.innerHeight / -16, -200, 500);

                                        camera.position.x = 10;

                                        camera.position.y = 10;
```

```
                                                camera.position.z = -10;

                                                camera.lookAt(scene.position);

                                                this.perspective = "Isometric";

                                    } else if (camAngle == 4) {

                                                camAngle = 5;

                                                camera = new THREE.OrthographicCamera(window.innerWidth / -16,
window.innerWidth / 16, window.innerHeight / 16, window.innerHeight / -16, -200, 500);

                                                camera.position.x = 20;

                                                camera.position.y = 2;

                                                camera.position.z = 0;

                                                camera.lookAt(scene.position);

                                                this.perspective = "One-point perspective";

                                    } else {

                                                camAngle = 0;

                                                camera = new THREE.OrthographicCamera(window.innerWidth / -16,
window.innerWidth / 16, window.innerHeight / 16, window.innerHeight / -16, -200, 500);

                                                camera.position.x = 20;

                                                camera.position.y = 10;

                                                camera.position.z = -20;

                                                camera.lookAt(scene.position);

                                                this.perspective = "Three-point perspective";

                                    }

                        };

   };


   var gui = new dat.GUI();

   gui.add(controls, 'rotationSpeed', 0, 0.5);

   gui.add(controls, 'addCube');

   gui.add(controls, 'removeCube');
```

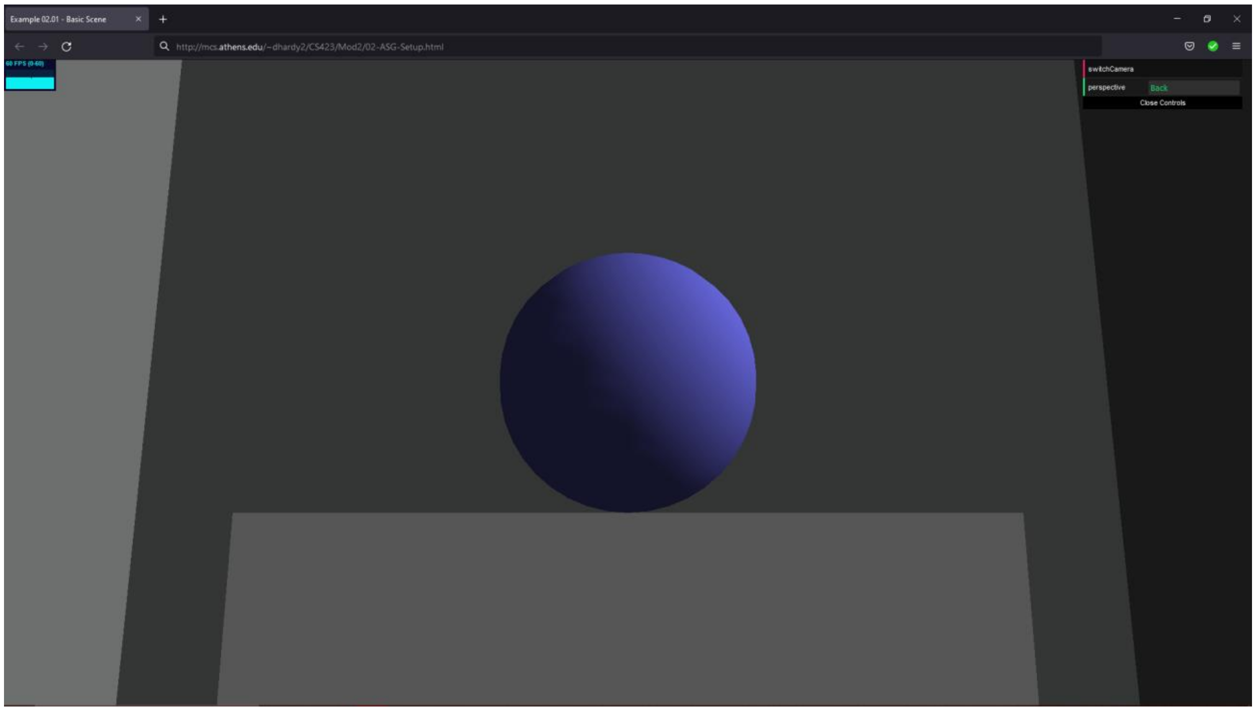
```
    gui.add(controls, 'outputObjects');
    gui.add(controls, 'numberOfObjects').listen();
            gui.add(controls, 'switchCamera');
            gui.add(controls, 'perspective').listen();

    render();

    function render() {
        stats.update();

        // rotate the cubes around its axes
        scene.traverse(function (e) {
            if (e instanceof THREE.Mesh && e != plane) {

                e.rotation.x += controls.rotationSpeed;
                e.rotation.y += controls.rotationSpeed;
                e.rotation.z += controls.rotationSpeed;
            }
        });

        // render using requestAnimationFrame
        requestAnimationFrame(render);
        renderer.render(scene, camera);
    }

}
window.onload = init;
```


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-ASG-Setup.html
54 FPS (0-60)
switchCamera
Close Controls

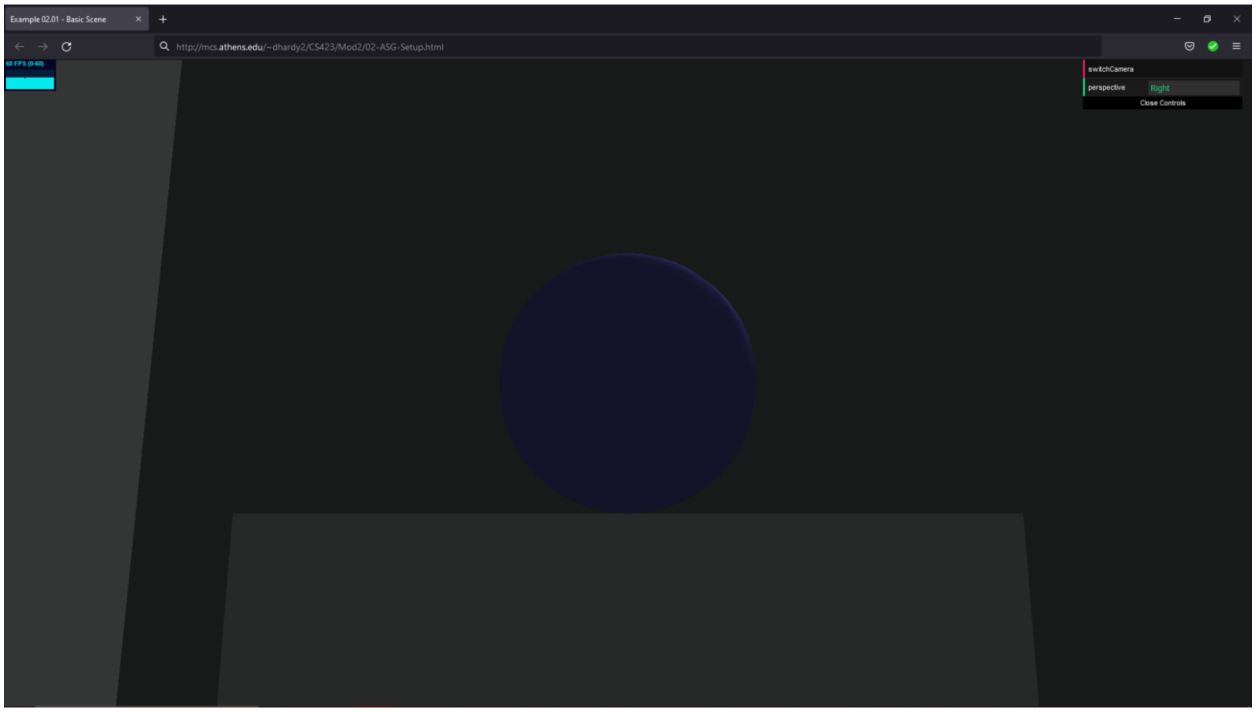
perspective Front


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-ASG-Setup.html
59 FPS (0-60)
switchCamera
Close Controls

perspective Left


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-ASG-Setup.html
60 FPS (0-60)
switchCamera
Close Controls

perspective Back


Example 02.01 - Basic Scene
http://mcs.athens.edu/~dhardy2/CS423/Mod2/02-ASG-Setup.html
60 FPS (0-60)
switchCamera
Close Controls

perspective Right

ASG

```
<!DOCTYPE html>

<HTML>

<HEAD>
```

```
		<TITLE>Example 02.01 - Basic Scene</TITLE>
		<SCRIPT TYPE="text/javascript" SRC="../libs/three.js"></SCRIPT>
		<SCRIPT TYPE="text/javascript" SRC="../libs/stats.min.js"></SCRIPT>
		<SCRIPT TYPE="text/javascript" SRC="../libs/dat.gui.min.js"></SCRIPT>
		<STYLE>
			body {
				/* set margin to 0 and overflow to hidden, to go fullscreen */
				margin: 0;
				overflow: hidden;
				}
		</STYLE>
	</HEAD>
	<BODY>
	<DIV id="Stats-output">
	</DIV>
	<!-- DIV which will hold the Output -->
	<DIV id="WebGL-output">
	</DIV>
	<!-- Javascript code that runs our Three.js examples -->
	<SCRIPT TYPE="text/javascript" SRC="02-ASG-Setup.js">
	</SCRIPT>
	</BODY>
	</HTML>
```

```
//
// File:
// Author:
// Purpose:
```

```
//
function init() {


   var stats = initStats();


   // create a scene, that will hold all our elements such as objects, cameras and lights.
   var scene = new THREE.Scene();


   // create a camera, which defines where we're looking at.
   var camera = new THREE.PerspectiveCamera(45, window.innerWidth / window.innerHeight, 0.1,
1000);
   camera.position.x = 30;
   camera.position.y = 20;
   camera.position.z = 0;


   // create a render and set the size
   var renderer = new THREE.WebGLRenderer();


   renderer.setClearColor(new THREE.Color(0xEEEEEE, 1.0));
   renderer.setSize(window.innerWidth, window.innerHeight);


   // create the ground plane
   var planeGeometry = new THREE.PlaneGeometry(180, 180);
   var planeMaterial = new THREE.MeshLambertMaterial({color: 0xffffff});
   var plane = new THREE.Mesh(planeGeometry, planeMaterial);



   // rotate and position the plane
   plane.rotation.x = -0.5 * Math.PI;
   plane.position.x = 0;

   plane.position.y = 0;

   plane.position.z = 0;


   // add the plane to the scene

   scene.add(plane);


   // Room

   var cubeGeometry = new THREE.BoxGeometry(1,100,100);

   var cubeMaterial = new THREE.MeshLambertMaterial({color: 0x979A9A});

   var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);

   cube.position.x = 50;

   cube.position.y = 25;

   cube.position.z = 0;

   scene.add(cube);


   var cubeGeometry = new THREE.BoxGeometry(100,100,1);

   var cubeMaterial = new THREE.MeshLambertMaterial({color: 0x979A9A});

   var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);

   cube.position.x = 0;

   cube.position.y = 25;

   cube.position.z = 50;

   scene.add(cube);


   var cubeGeometry = new THREE.BoxGeometry(1,100,100);

   var cubeMaterial = new THREE.MeshLambertMaterial({color: 0x979A9A});

   var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);

   cube.position.x = -50;

   cube.position.y = 25;
   cube.position.z = 0;

   scene.add(cube);


   var cubeGeometry = new THREE.BoxGeometry(100,100,1);

   var cubeMaterial = new THREE.MeshLambertMaterial({color: 0x979A9A});

   var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);

   cube.position.x = 0;

   cube.position.y = 25;

   cube.position.z = -50;

   scene.add(cube);




           // Pedestal cube

   var cubeGeometry = new THREE.BoxGeometry(20,20,20);

           var cubeMaterial = new THREE.MeshLambertMaterial({color: 0xF4F6F7});

   var cube = new THREE.Mesh(cubeGeometry, cubeMaterial);

   cube.position.x = 0;

   cube.position.y = 10;

   cube.position.z = 0;

   scene.add(cube);


           // Item Sphere

   var sphereGeometry = new THREE.SphereGeometry(5, 20, 20);

   var sphereMaterial = new THREE.MeshLambertMaterial({color: 0x7777ff});

   var sphere = new THREE.Mesh(sphereGeometry, sphereMaterial);

   sphere.position.x = 0;

   sphere.position.y = 25;

   sphere.position.z = 0;
```

```
    scene.add(sphere);



    var directionalLight = new THREE.DirectionalLight(0xffffff, 0.7);
    directionalLight.position.set(-20, 40, 60);
    scene.add(directionalLight);



    // add subtle ambient lighting
    var ambientLight = new THREE.AmbientLight(0x292929);
    scene.add(ambientLight);

    // add the output of the renderer to the html element
    document.getElementById("WebGL-output").appendChild(renderer.domElement);

    // call the render function
    var step = 0;

    // Insert Lab03 code here.
            // New Controls
            var camSpot = 1;
            var controls = new function () {
                    this.perspective = "Front";
                    this.switchCamera = function () {
                            if (camSpot == 0) {
                                    camSpot = 1;
                                    camera = new THREE.PerspectiveCamera(45, window.innerWidth /
window.innerHeight, 0.1, 1000);
                                    camera.position.x = 30;
                                    camera.position.y = 20;
                                    camera.position.z = 0;
                                    camera.lookAt(0, 25, 0);
                                    this.perspective = "Front";
                            } else if (camSpot == 1) {
                                    camSpot = 2;
                                    camera = new THREE.PerspectiveCamera(45, window.innerWidth /
window.innerHeight, 0.1, 1000);
                                    camera.position.x = 0;
                                    camera.position.y = 20;
                                    camera.position.z = 30;
                                    camera.lookAt(0, 25, 0);
                                    this.perspective = "Left";
                            } else if (camSpot == 2) {
                                    camSpot = 3;
                                    camera = new THREE.PerspectiveCamera(45, window.innerWidth /
window.innerHeight, 0.1, 1000);
                                    camera.position.x = -30;
                                    camera.position.y = 20;
                                    camera.position.z = 0;
                                    camera.lookAt(0, 25, 0);
                                    this.perspective = "Back";
                            } else {
                                    camSpot = 0;
                                    camera = new THREE.PerspectiveCamera(45, window.innerWidth /
window.innerHeight, 0.1, 1000);
                                    camera.position.x = 0;
                                    camera.position.y = 20;
                                    camera.position.z = -30;
                                    camera.lookAt(0, 25, 0);
```

```
                                        this.perspective = "Right";
                                 }









                          };
                 };

                 var gui = new dat.GUI();
                 gui.add(controls, 'switchCamera');
                 gui.add(controls, 'perspective').listen();

        // make sure that for the first time, the
        // camera is looking at the scene
        camera.lookAt(0, 25, 0);
        render();

        function render() {

            stats.update();
            // render using requestAnimationFrame
            requestAnimationFrame(render);
            renderer.render(scene, camera);
        }

        function initStats() {
```

```
        var stats = new Stats();

        stats.setMode(0); // 0: fps, 1: ms

        // Align top-left
        stats.domElement.style.position = 'absolute';
        stats.domElement.style.left = '0px';
        stats.domElement.style.top = '0px';

        document.getElementById("Stats-output").appendChild(stats.domElement);

        return stats;
    }
}

window.onload = init
```