Lab 2 Transforms

1. Translate a single triangle around world space.
   1. Move the triangle 2 units to the right (positive in the x-axis).
   2. Move the triangle 2 units to the left (negative in the x-axis).
   3. Move the triangle 1 unit up (positive in the y-axis).
   4. Move the triangle 2 units towards the camera (positive in the z-axis). Be careful when moving on Z axis that it doesn’t go past the camera.
2. Remove the translate and now scale the triangle.
   1. First make the triangle twice its original size.
   2. Then make it half its original size.
3. Add keyboard controls to control rotating a single triangle around the Y axis. For example, the ‘6’ rotates the triangle in the positive direction and ‘4’ rotates in the negative direction.
4. In the lecture we discussed the challenges of translating, rotating and scaling objects in the correct order.
   1. Get your triangle to spin clockwise at a location that is 2 units to the right of the origin
   2. Now have your triangle rotate/orbit around the origin of the scene at distance of 1.5 units
   3. Now scale your triangle to half the size but keep it the same distance from the origin.
   4. Play around with the order of these three transforms and note the changes in how the scene is rendered
5. Render two triangles on screen side by side. The left triangle at normal size and the right triangle at half the size.
6. Create the solar system discussed in the lecture.
   1. Add an additional planet that orbits the sun further away than the already existing planets
   2. Give this new planet two moons
   3. Give the moon on the second planet its own moon (a moon with a moon)
   4. Add additional variables for rotation so each planet has its own rotation speed
   5. Play around with the axes which the planets and moons orbit, so it’s not all rotating around the y-axis