Lab #5 – cpe471
Practice with transforms

Today we will explore matrix transforms applied to a 3D model and build a city. Starting with the Lab4 release cod, we will build up your city. Once again today, we will only be modifying the .cpp file, but be sure that you understand the code in the shader files.

Task 1:
Modify the code to draw a house. To do this, you will need to add vertices for the two peaks of the roof. Then you need to add indices to the list for all sides of the house and roof. Organize the index lists such that you can specify a different color for the roof. Make something that looks like this (which is 3D, but shown from a frontal view here):

![Diagram of a house with two peaks on the roof.](image)

Task 2:
Now modify the code to draw a city. Note that your city must meet the following requirements:

1) Have at least 10 buildings, half of which are rotated at a different angle from the others.

2) Each building must be randomly scaled in at least two dimensions (with constraints to make the scales seem reasonable, e.g. no doll houses next to empire state buildings).

3) Despite the variance in scaling, the buildings need to be aligned vertically (all sitting on the ground plane) and all aligned along the front and aligned sitting adjacent to one another. Think about how to best store the transforms for each building.

4) Each building should be colored differently. Your final city should look something like this: