

Homework 7

COMP 575/770 Spring 2016

Due: April 18, 2016 (in Class)

Instructions Please work on the problems on your own. It is okay to discuss the problems with other students, but please write your answer independently. If you are able to find any part of the solution in a book or some source on the Internet, please acknowledge that source.

1 Rasterization

A particular triangle, when rasterized, produces the following fragments (Table 1), each with pixel coordinates (x_s, y_s) and screen-space depth z_s : What are the (x, y) coordinates and depths of the triangle's three vertices?

x_s	y_s	z_s
13	22	19.2
14	22	19.4
10	23	18.9
11	23	19.1
12	23	19.3
13	23	19.5
10	24	19.2
11	24	19.4
12	24	19.6
10	25	19.5
11	25	19.7
12	25	19.9
11	26	20

Table 1: Rasterized Fragments

Hint: The answer is not unique.

2 Triangle Strips

Given a cube, by dividing each face into two triangles, we could create a mesh with 12 triangles. Figure 1 illustrates one possible way of dividing the faces.

We can use 3 triangle strips to represent the mesh: $(3, 1, 4, 5, 8, 6, 7, 2, 3, 1)$, $(1, 2, 5, 6)$ and $(4, 8, 3, 7)$.

By changing how the cube is divided into triangles, you can get away with fewer strips. Find a triangulation and a set of triangle strips that represent the cube with as few strips as possible.

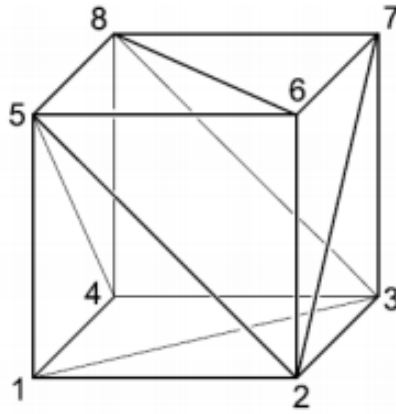


Figure 1: Triangle mesh of a cube