

# Homework 1

1.

Using  $V_3: (4.5, 4, 4.5)$

$$S * U_3 = V_3$$

$$\begin{vmatrix} s_x & 0 & 0 & 0 \\ 0 & s_y & 0 & 0 \\ 0 & 0 & s_z & 0 \\ 0 & 0 & 0 & 1 \end{vmatrix} * \begin{vmatrix} 1 \\ 1 \\ 1 \\ 1 \end{vmatrix} = \begin{vmatrix} 4.5 \\ 4 \\ 4.5 \\ 1 \end{vmatrix}$$

$$s_x * 1 = 4.5$$

$$s_x = 4.5$$

$$s_y * 1 = 4$$



$$s_y = 4$$

$$s_z * 1 = 4.5$$

$$s_z = 4.5$$

**S =**

$$\begin{vmatrix} 4.5 & 0 & 0 & 0 \\ 0 & 4 & 0 & 0 \\ 0 & 0 & 4.5 & 0 \\ 0 & 0 & 0 & 1 \end{vmatrix}$$

2.

Triangle patches

Front Right: (V1, V5, V7)

(V1, V7, V3)

Back Right: (V5, V4, V7)

(V7, V4, V6)

Back Left: (V4, V6, V2)

(V4, V0, V2)

Front Left: (V0, V1, V2)

(V1, V3, V2)

Top: (V2, V3, V7)

(V2, V7, V6)

Bottom: (V4, V5, V1)

(V4, V1, V0)