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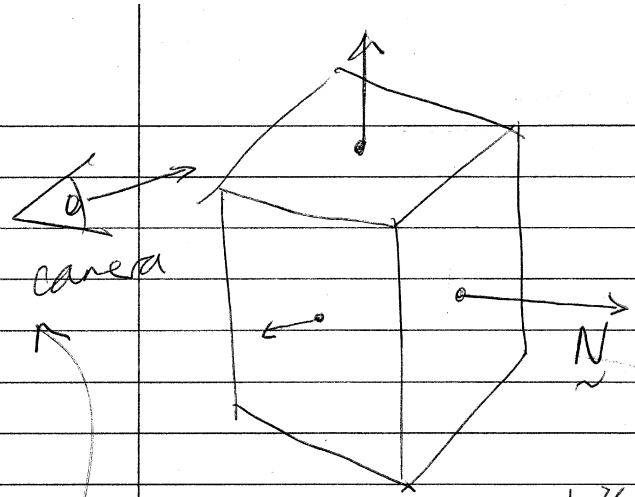

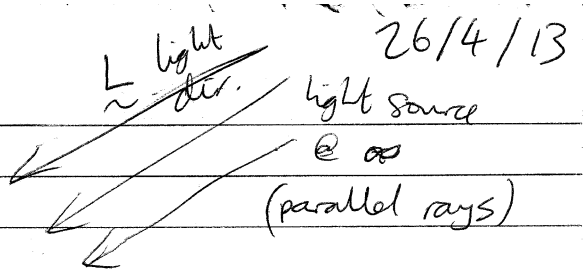

material's diffuse reflectivity

$$\text{diffuse} = \underline{I}\,(\hat{L} \cdot \hat{N})$$

intensity

LAMBERT'S LAW:

dot product

$$\begin{bmatrix} a \\ b \\ c \end{bmatrix} \cdot \begin{bmatrix} d \\ e \\ f \end{bmatrix} = adt be + cf$$

The intensity does NOT depend on camera angle

pseudo code:

```
function dot (a, b):
    return {a.x * b.x +
            a.y * b.y +
            a.z * b.z}
```

dot product (see C4 text book)

have to normalise directions

```
diffuseTerm = dot (lightDir ÷ length(lightDir),
                   normal[i] ÷ length(normal[i]))

diffuse = diffuseTerm * diffuseColour
```

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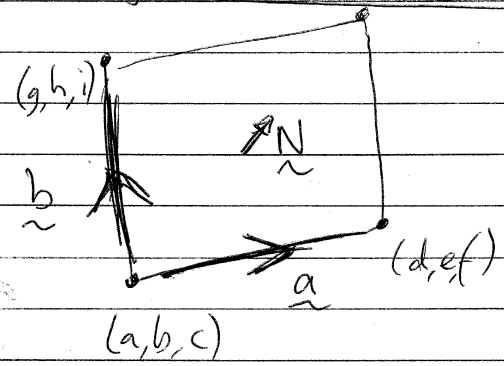
calculating cube normals



$\underset{\sim}{N}$ is coming out of page (right hand rule)

vector $\underset{\sim}{a} = \begin{bmatrix} d-a \\ e-b \\ f-c \end{bmatrix}$

$\underset{\sim}{b} = \begin{bmatrix} g-a \\ h-b \\ i-c \end{bmatrix}$

cross product perpendicular to two vertices

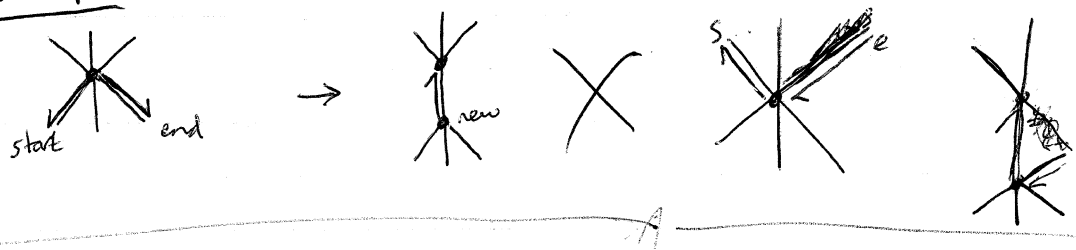
$\Rightarrow \underset{\sim}{N} = \underset{\sim}{a} \times \underset{\sim}{b}$

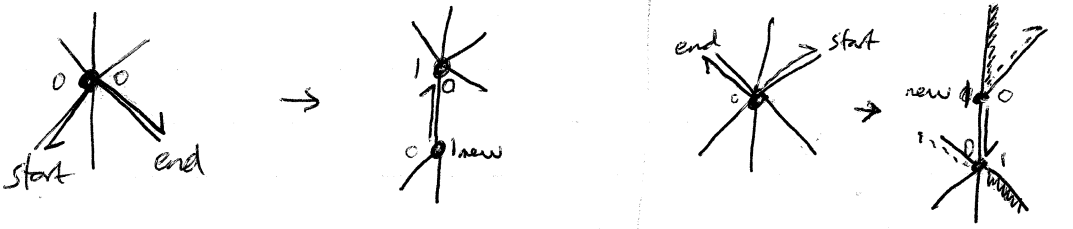
~~$= \begin{bmatrix} (d-a)(h-b) - (e-b)(g-a) \end{bmatrix}$~~

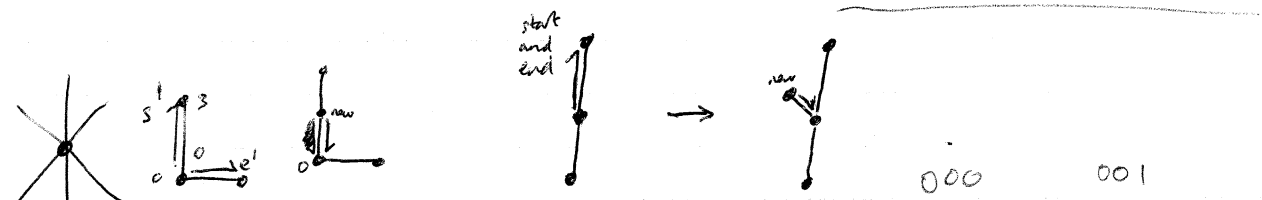
~~$\begin{bmatrix} a_x b_y & a_y b_x \\ a_y b_z & a_z b_y \end{bmatrix}$~~

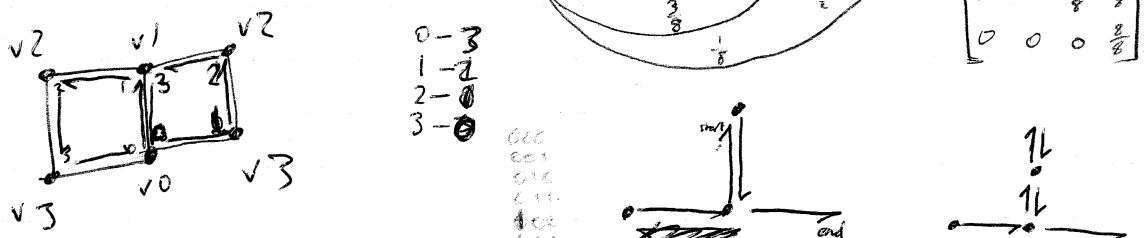
$$\begin{bmatrix} a_y b_z - a_z b_y \\ a_z b_x - a_x b_z \\ a_x b_z - a_z b_x \end{bmatrix}$$

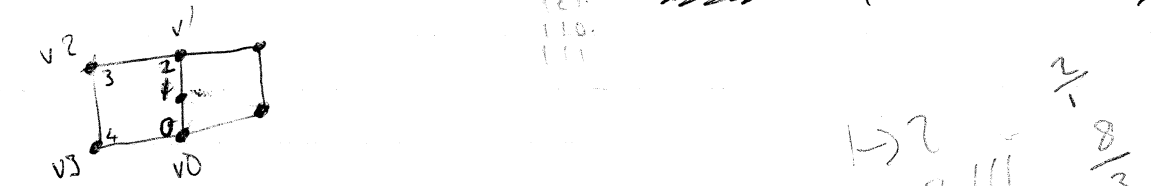
vertex split

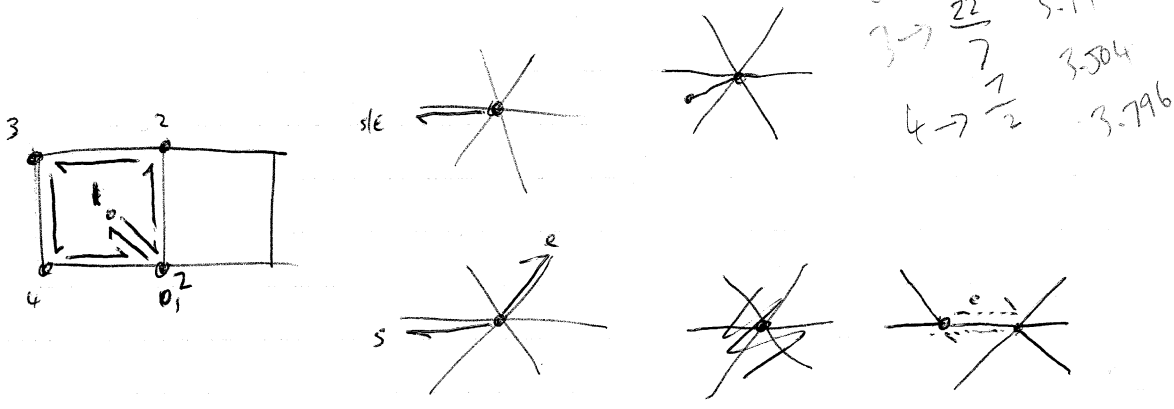






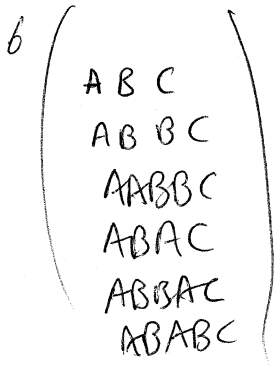







0 1 2 3 4 5
e
b

4501
01234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A B C
A B B C
A A B B C
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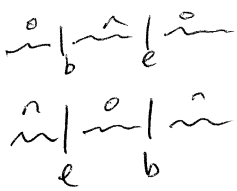
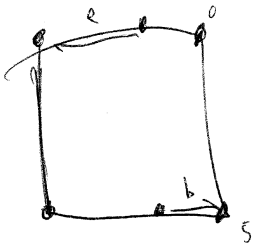
A B B A C
A B A B C


b
e
e
b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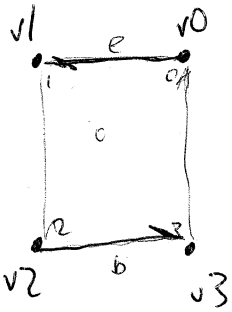
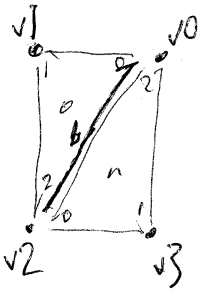
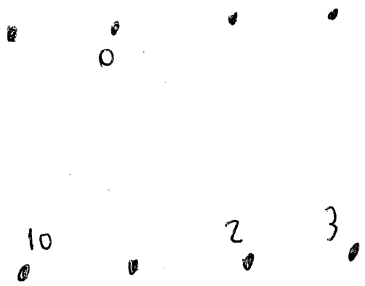

v1
e
v0
v2
b
v3


v1
v0
v2
v3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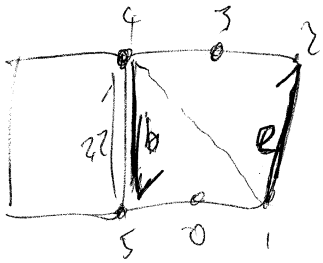
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3
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5
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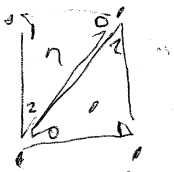
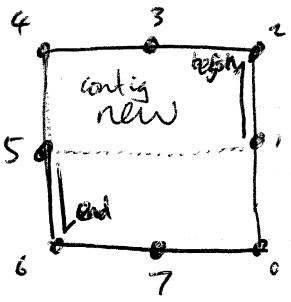
1

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3
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contig
new
begin
5
1
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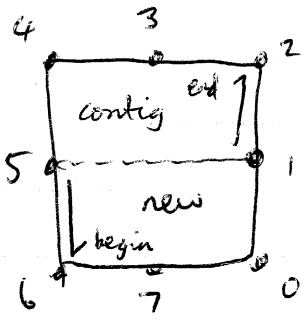
4
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contig
end
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new
begin
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