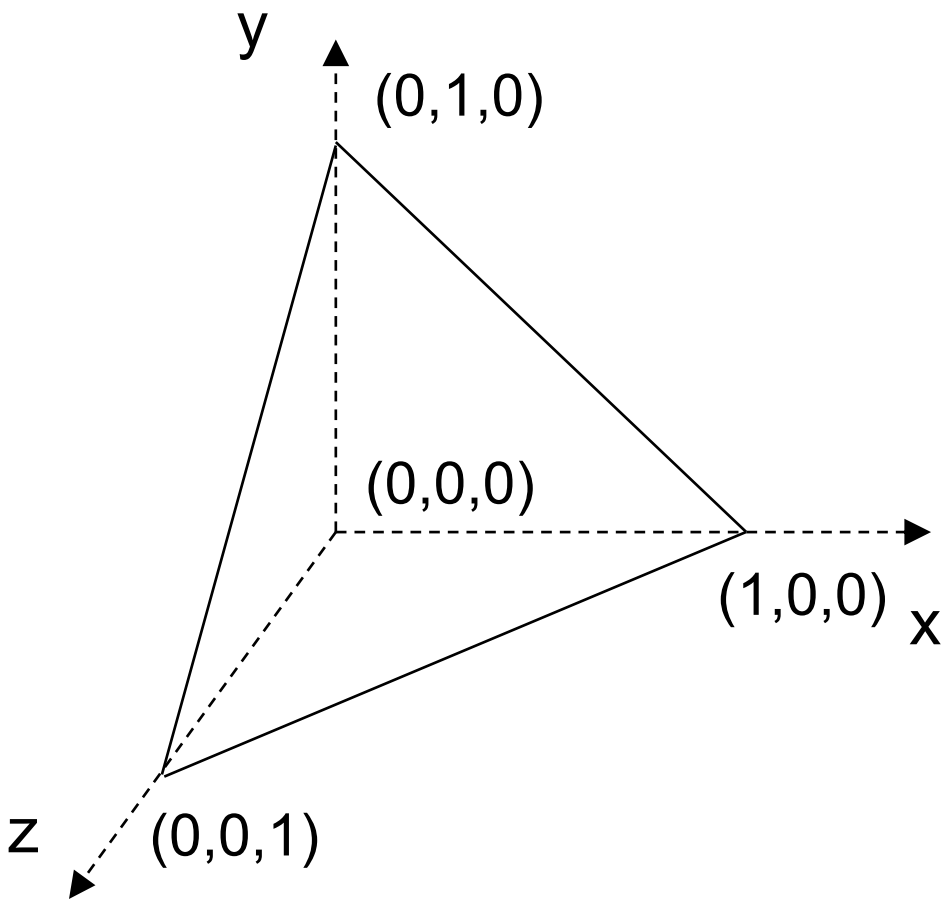
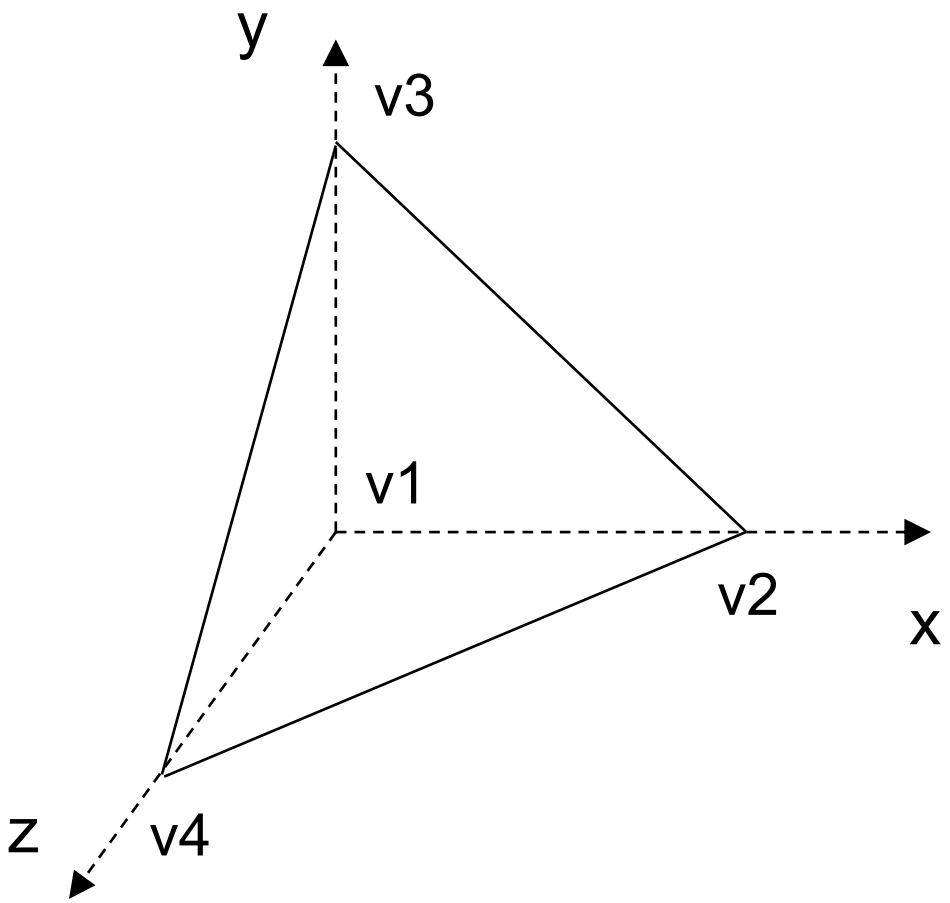


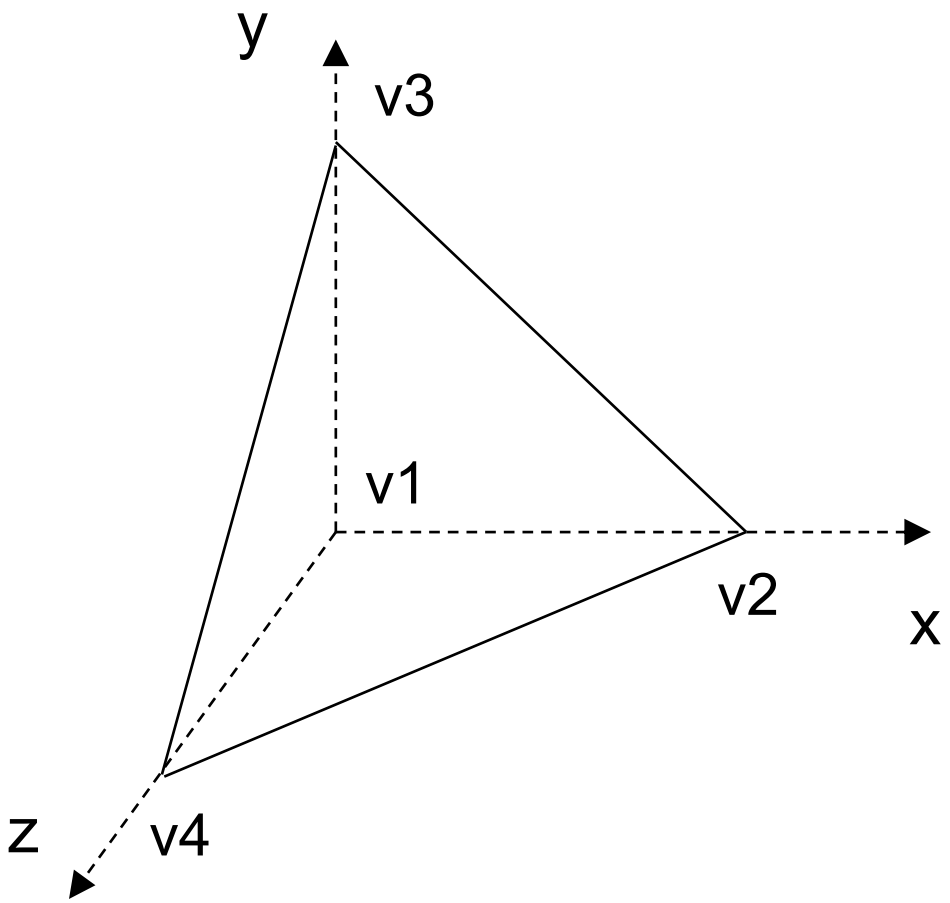
vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```



vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

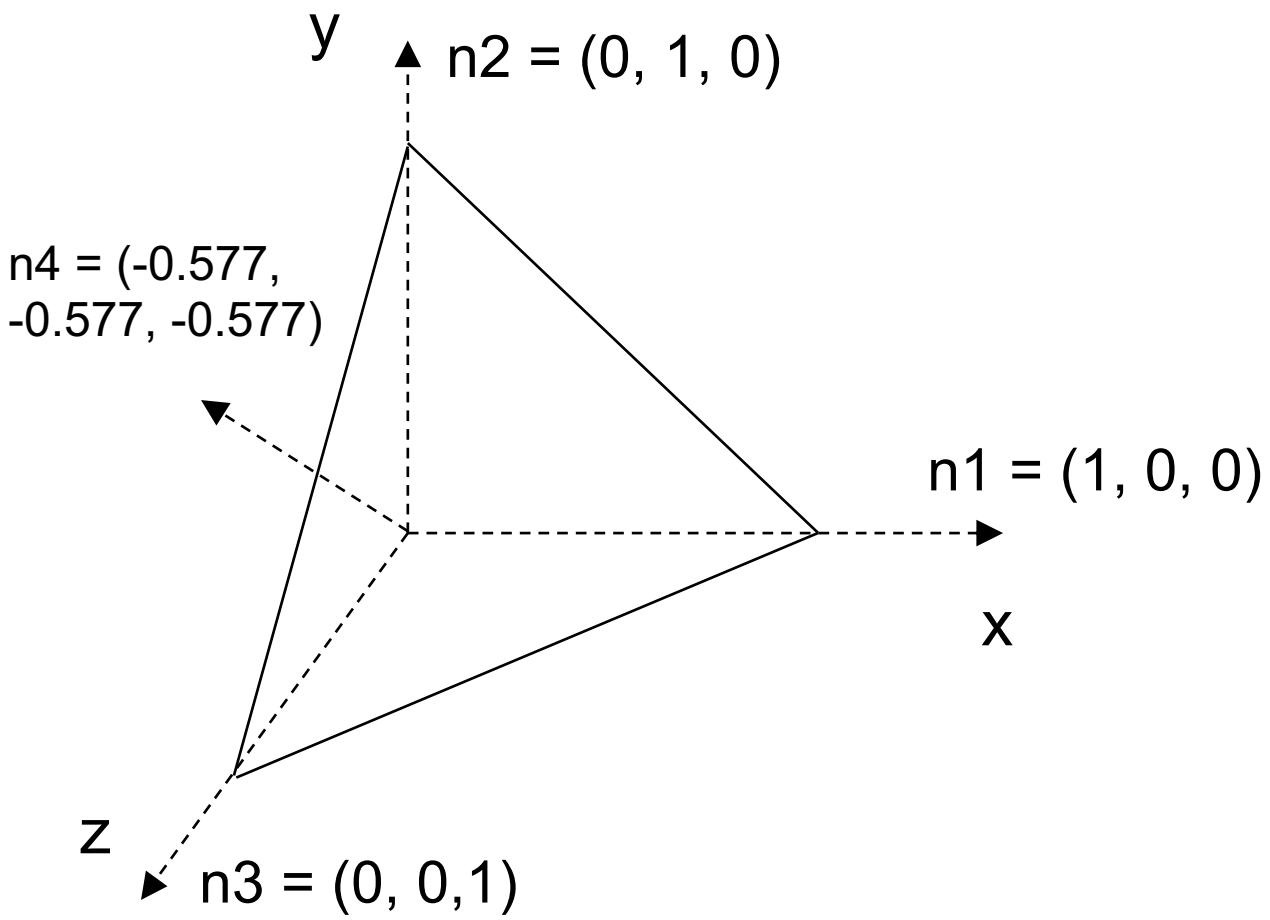


vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

face table

```
f  1, 3, 2
f  1, 2, 4
f  1, 4, 3
f  2, 3, 4
```

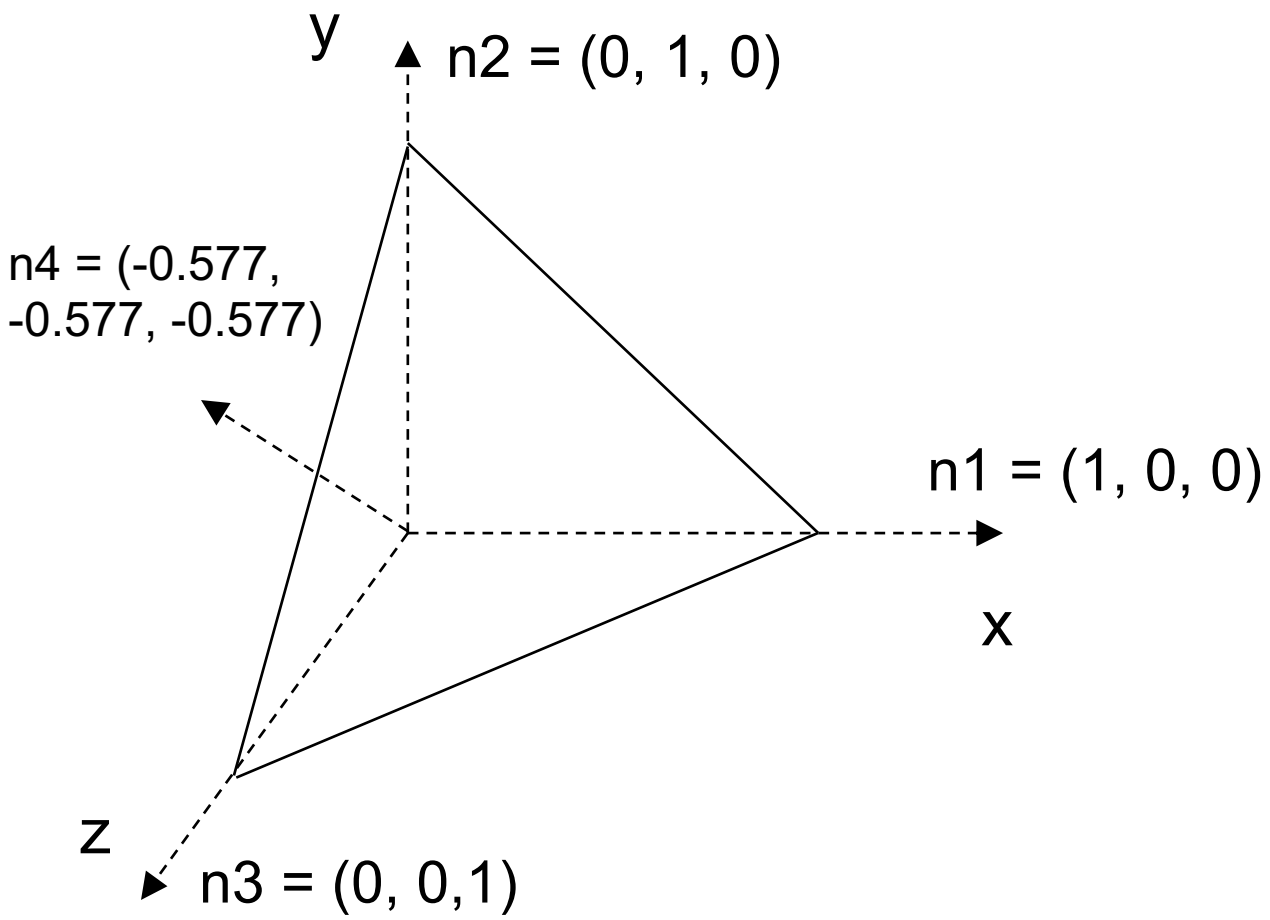


vertex table

v 0, 0, 0
v 1, 0, 0
v 0, 1, 0
v 0, 0, 1

face table

f 1, 3, 2
f 1, 2, 4
f 1, 4, 3
f 2, 3, 4



vertex table

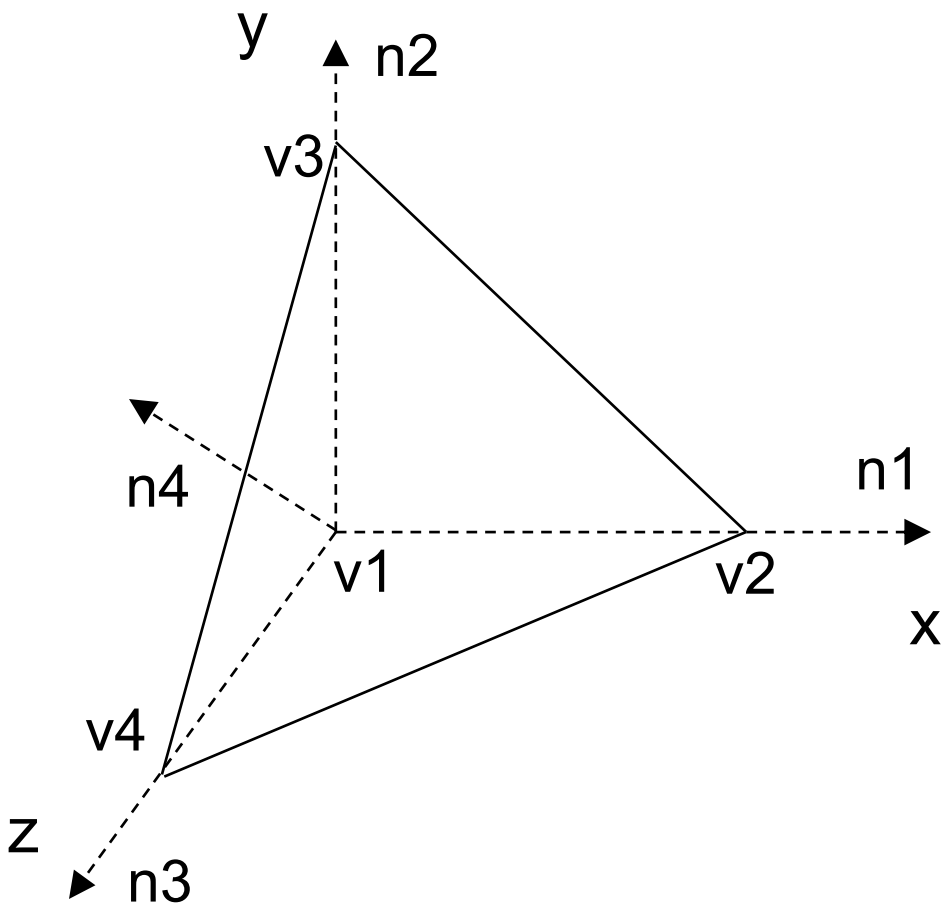
```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

normal table

```
vn  1, 0, 0
vn  0, 1, 0
vn  0, 0, 1
vn  -0.577, -0.577, -0.577
```

face table

```
f  1, 3, 2
f  1, 2, 4
f  1, 4, 3
f  2, 3, 4
```



vertex table

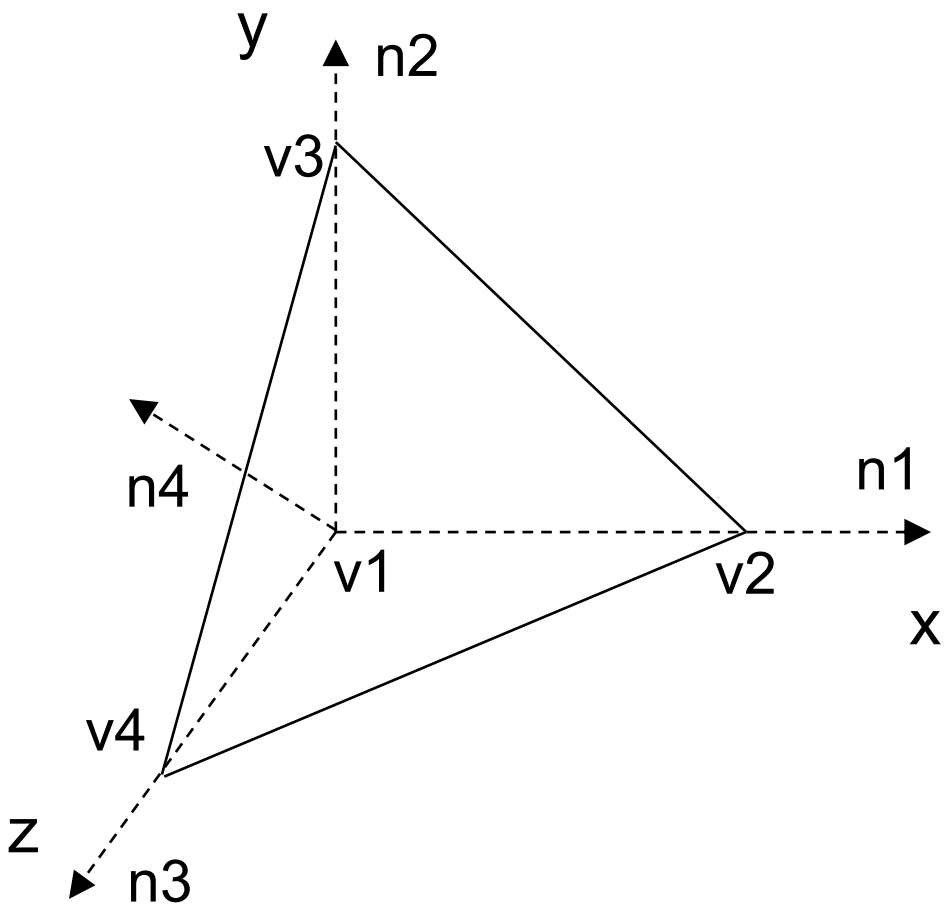
```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

normal table

```
vn  1, 0, 0
vn  0, 1, 0
vn  0, 0, 1
vn  -0.577, -0.577, -0.577
```

face table

```
f  1, 3, 2
f  1, 2, 4
f  1, 4, 3
f  2, 3, 4
```



vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

normal table

```
vn  1, 0, 0
vn  0, 1, 0
vn  0, 0, 1
vn  -0.577, -0.577, -0.577
```

face table

```
f  1/0/4, 3/0/2, 2/0/1
f  1/0/4, 2/0/1, 4/0/3
f  1/0/4, 4/0/3, 3/0/2
f  2/0/1, 3/0/2, 4/0/3
```

verList

```
v1.x, v1.y, v1.z, vn1.x, vn1.y, vn1.z,
v2.x, v2.y, v2.z, vn2.x, vn2.y, vn2.z,
                  ...
```

vertex table

0, 0, 0,	-0.577, -0.577, -0.577,
1, 0, 0,	1, 0, 0,
0, 1, 0,	0, 1, 0,
0, 0, 1,	0, 0, 1

reordered normal table

You need to write code to pair each vertex and each normal based on the information in the face set

vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

normal table

```
vn  1, 0, 0
vn  0, 1, 0
vn  0, 0, 1
vn  -0.577, -0.577, -0.577
```

face table

```
f  1/0/4, 3/0/2, 2/0/1
f  1/0/4, 2/0/1, 4/0/3
f  1/0/4, 4/0/3, 3/0/2
f  2/0/1, 3/0/2, 4/0/3
```

triList

$f_1.v_1$, $f_1.v_2$, $f_1.v_3$,
$f_2.v_1$, $f_2.v_2$, $f_2.v_3$,
…

face table

1, 3, 2,

1, 2, 4,

1, 4, 3,

2, 3, 4

vertex table

v 0, 0, 0
v 1, 0, 0
v 0, 1, 0
v 0, 0, 1

normal table

vn 1, 0, 0
vn 0, 1, 0
vn 0, 0, 1
vn -0.577, -0.577, -0.577

face table

f 1/0/4, 3/0/2, 2/0/1
f 1/0/4, 2/0/1, 4/0/3
f 1/0/4, 4/0/3, 3/0/2
f 2/0/1, 3/0/2, 4/0/3

We only need to store vertex indices in triList since we have paired vertex positions and normals

triList

$f_1.v_1$, $f_1.v_2$, $f_1.v_3$,
$f_2.v_1$, $f_2.v_2$, $f_2.v_3$,
…

face table

1, 3, 2,
1, 2, 4,
1, 4, 3,
2, 3, 4

minus every element by 1

triList

0, 2, 1,
0, 1, 3,
0, 3, 2,
1, 2, 3

In OBJ, index starts from 1 while in OpenGL index starts from 0

vertex table

```
v  0, 0, 0
v  1, 0, 0
v  0, 1, 0
v  0, 0, 1
```

normal table

```
vn  1, 0, 0
vn  0, 1, 0
vn  0, 0, 1
vn  -0.577, -0.577, -0.577
```

face table

```
f  1/0/4, 3/0/2, 2/0/1
f  1/0/4, 2/0/1, 4/0/3
f  1/0/4, 4/0/3, 3/0/2
f  2/0/1, 3/0/2, 4/0/3
```

Why not pair vertex position and normal in OBJ?

Reason: many vertices may share exactly the same normal!