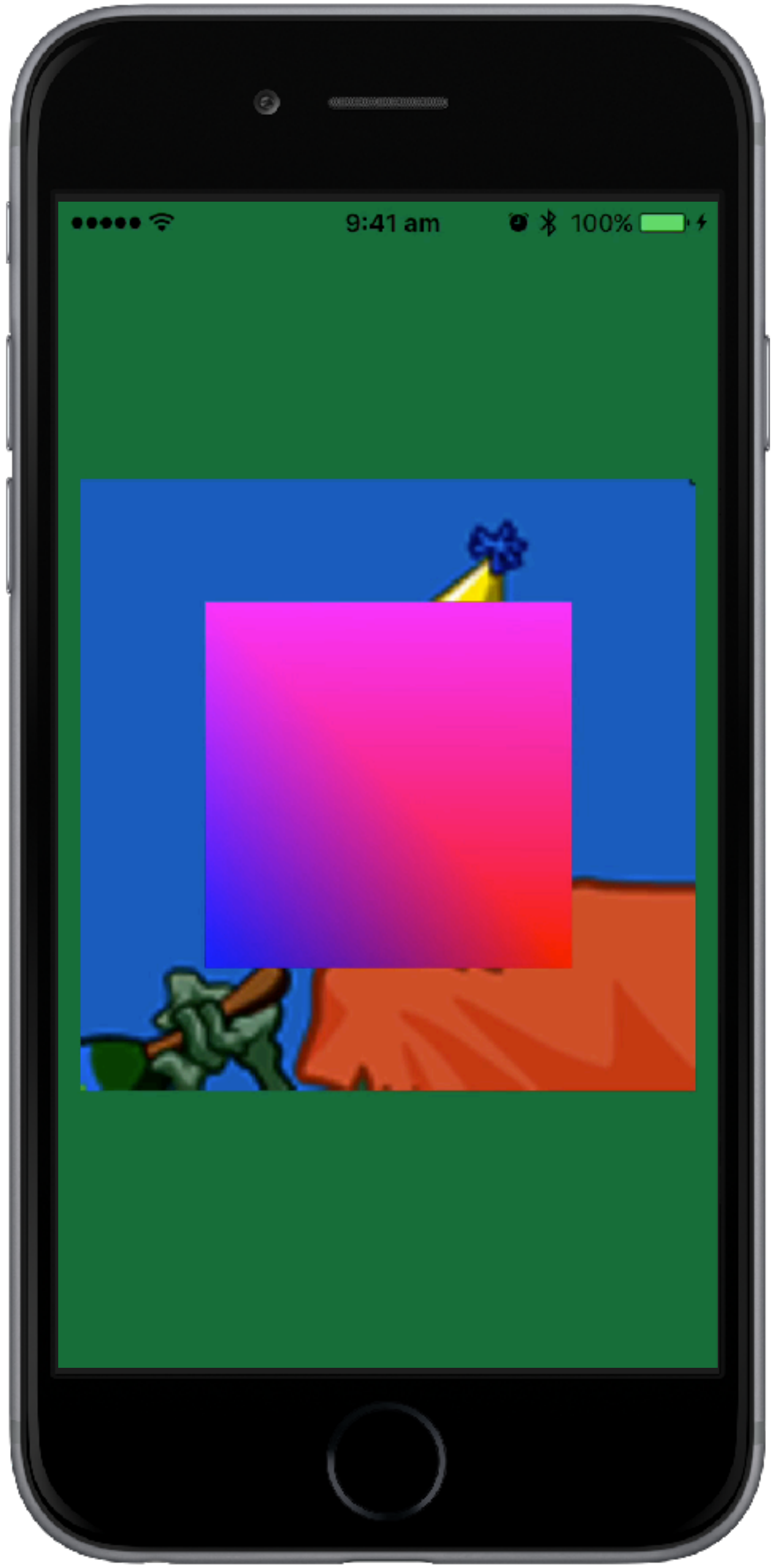
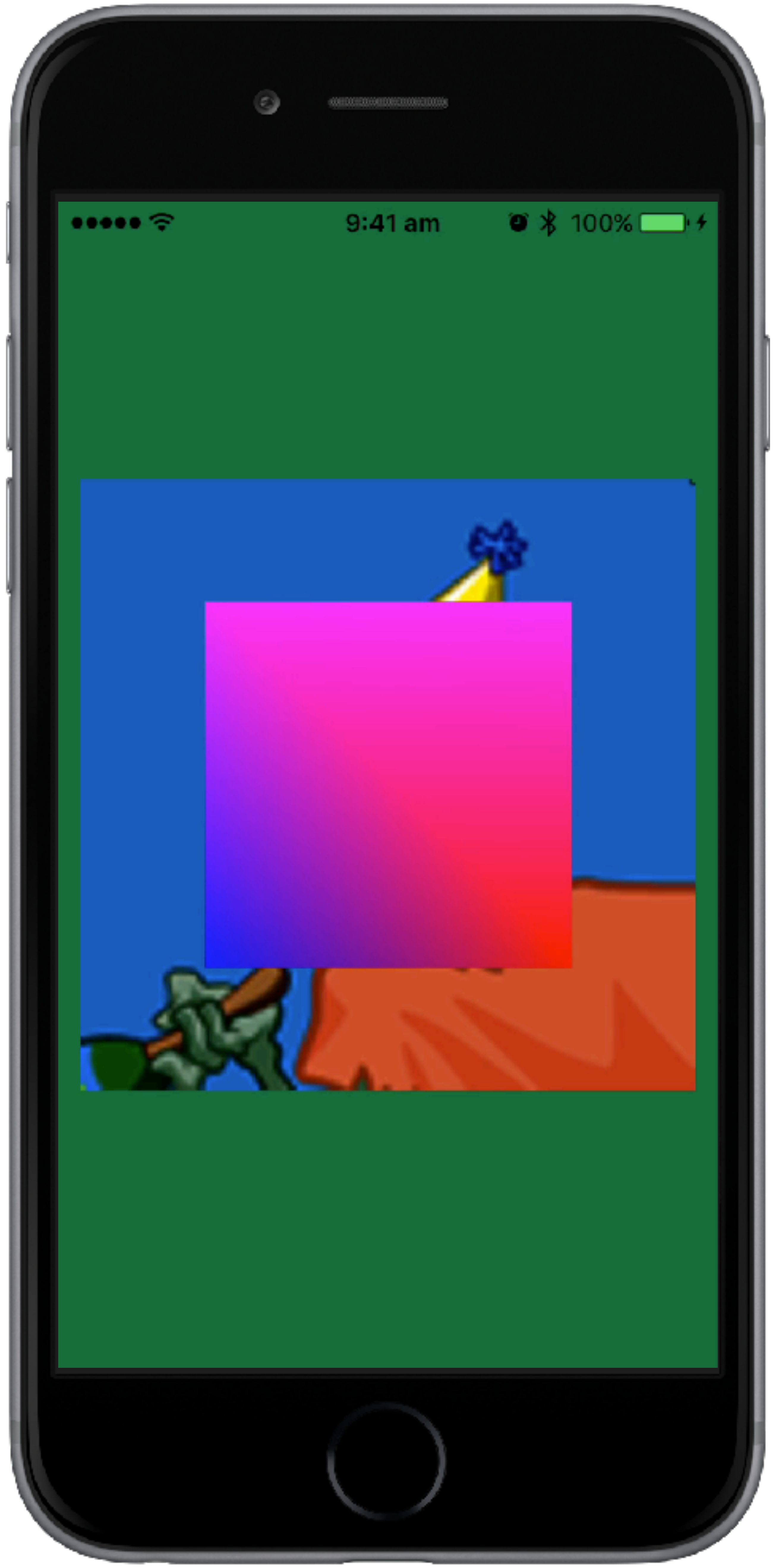
BEGINNING METAL

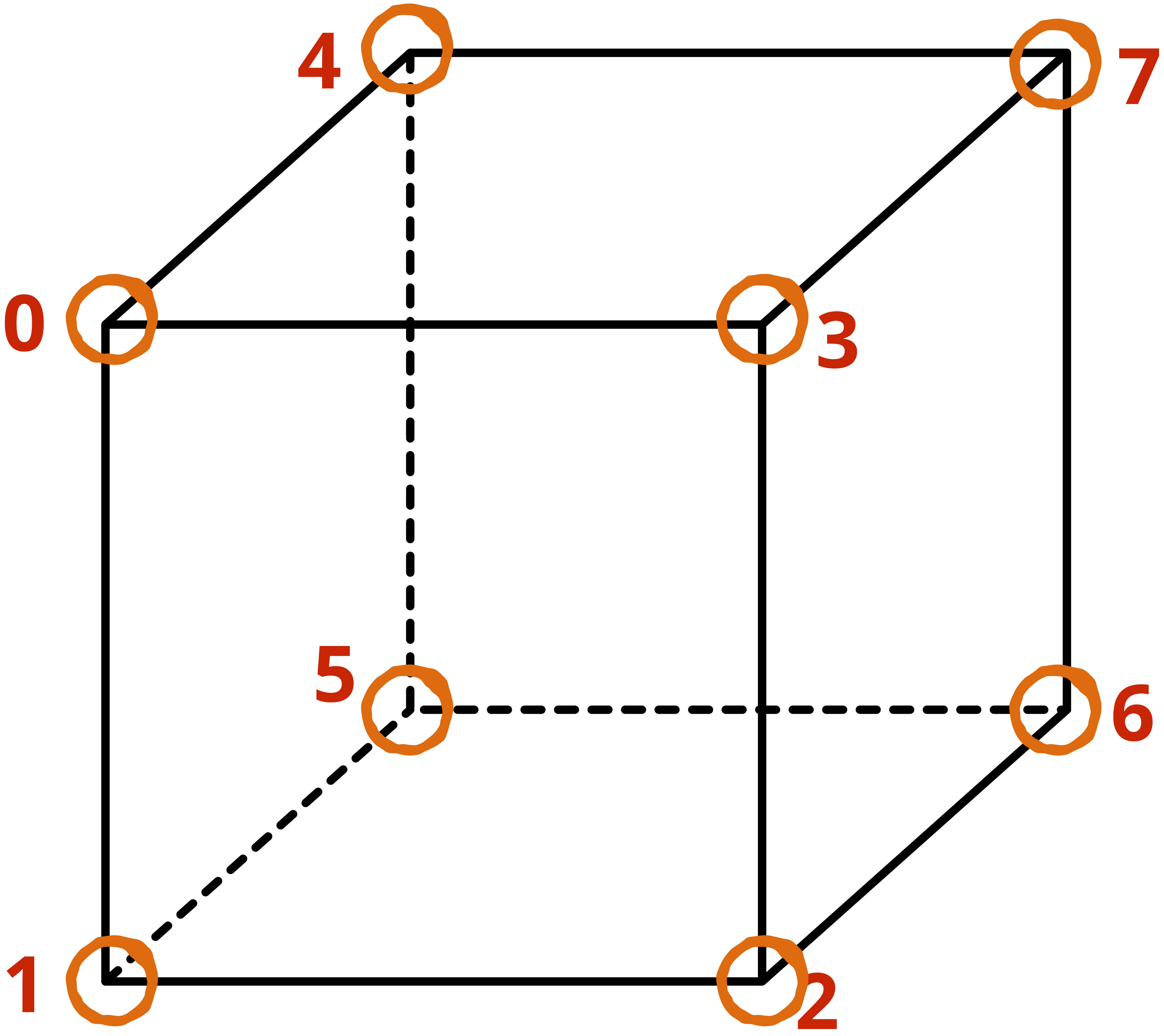
PART 8: DEPTH


9:41 am
100%

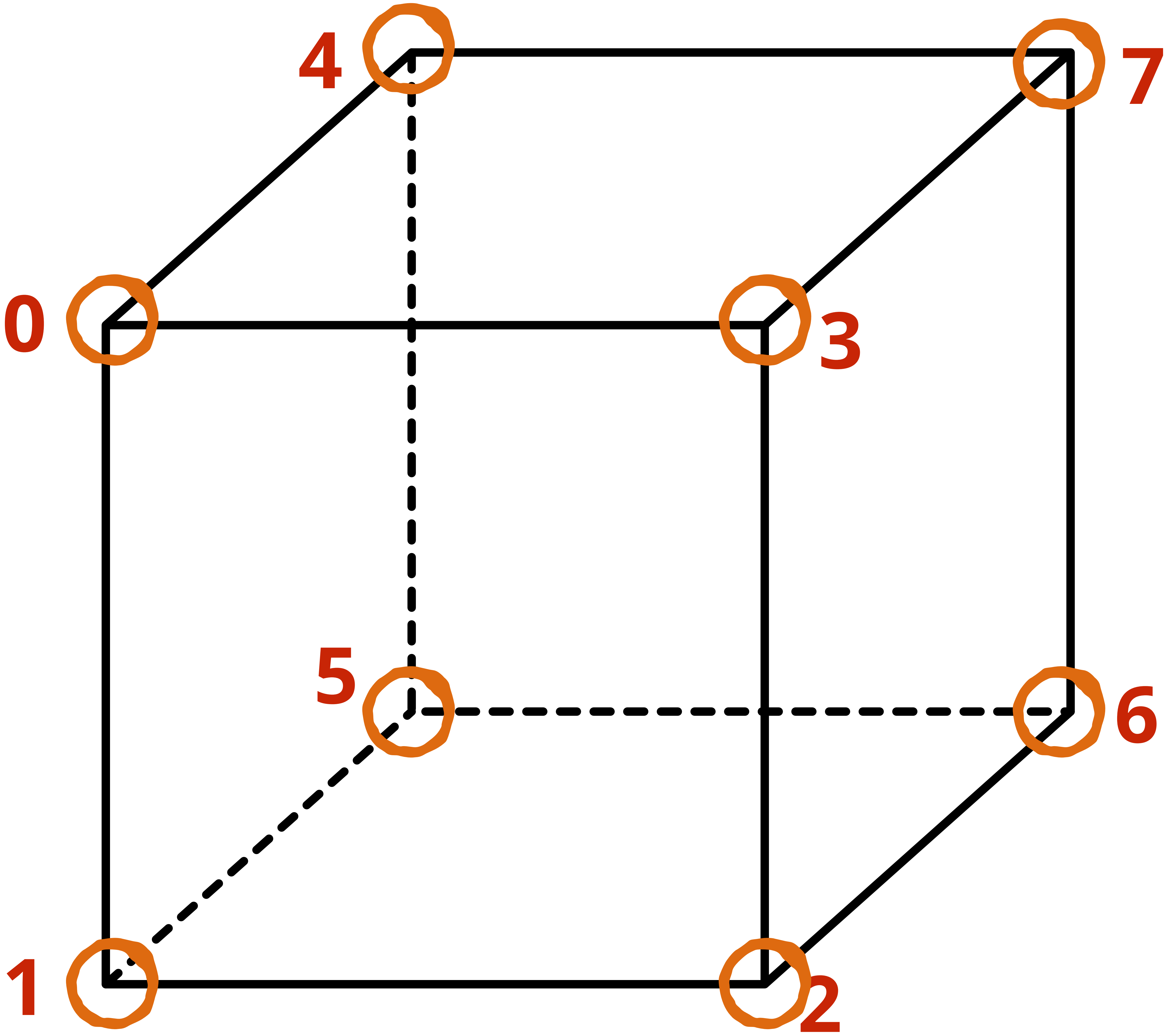


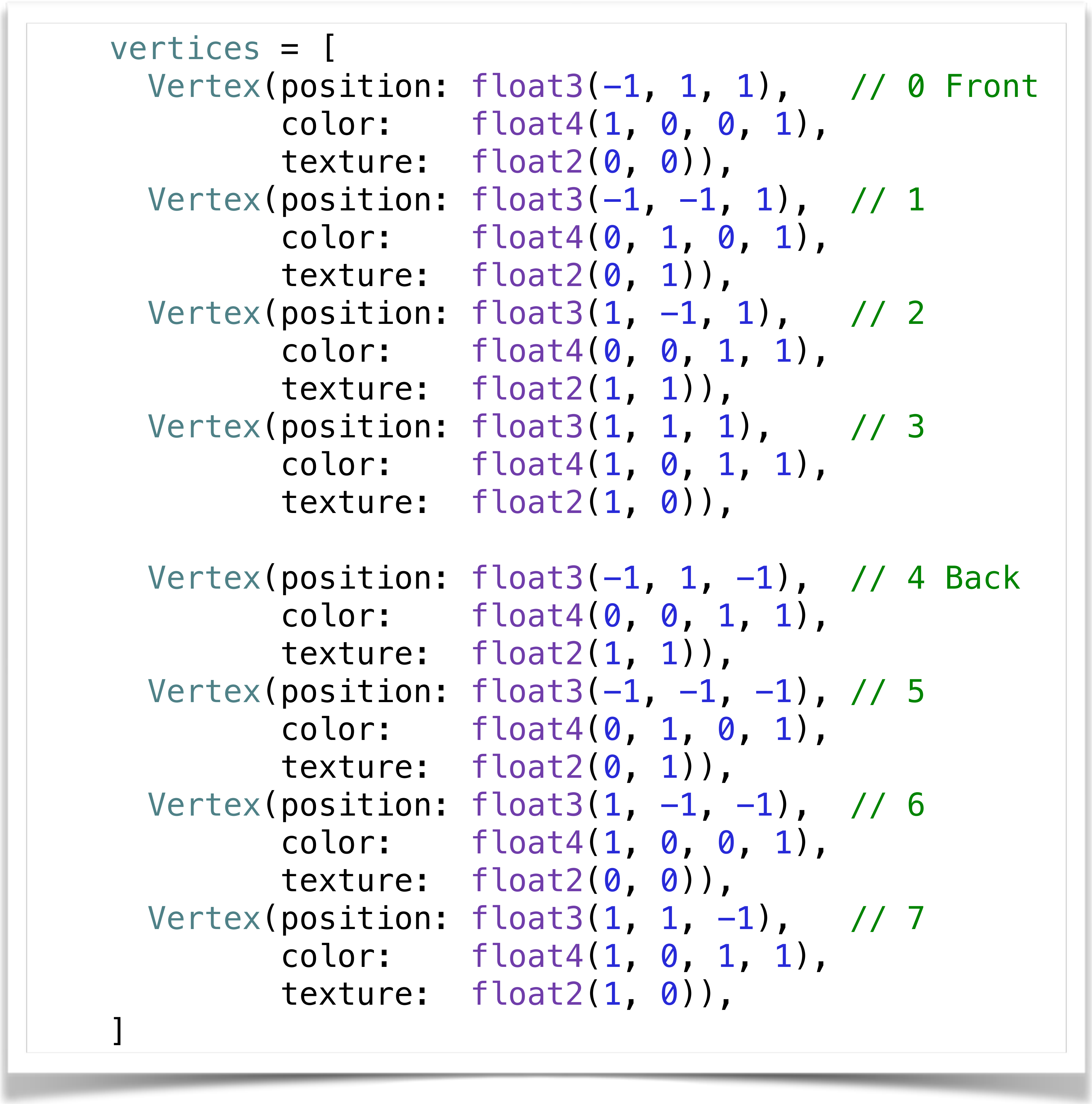
9:41 am
100%

3D Models



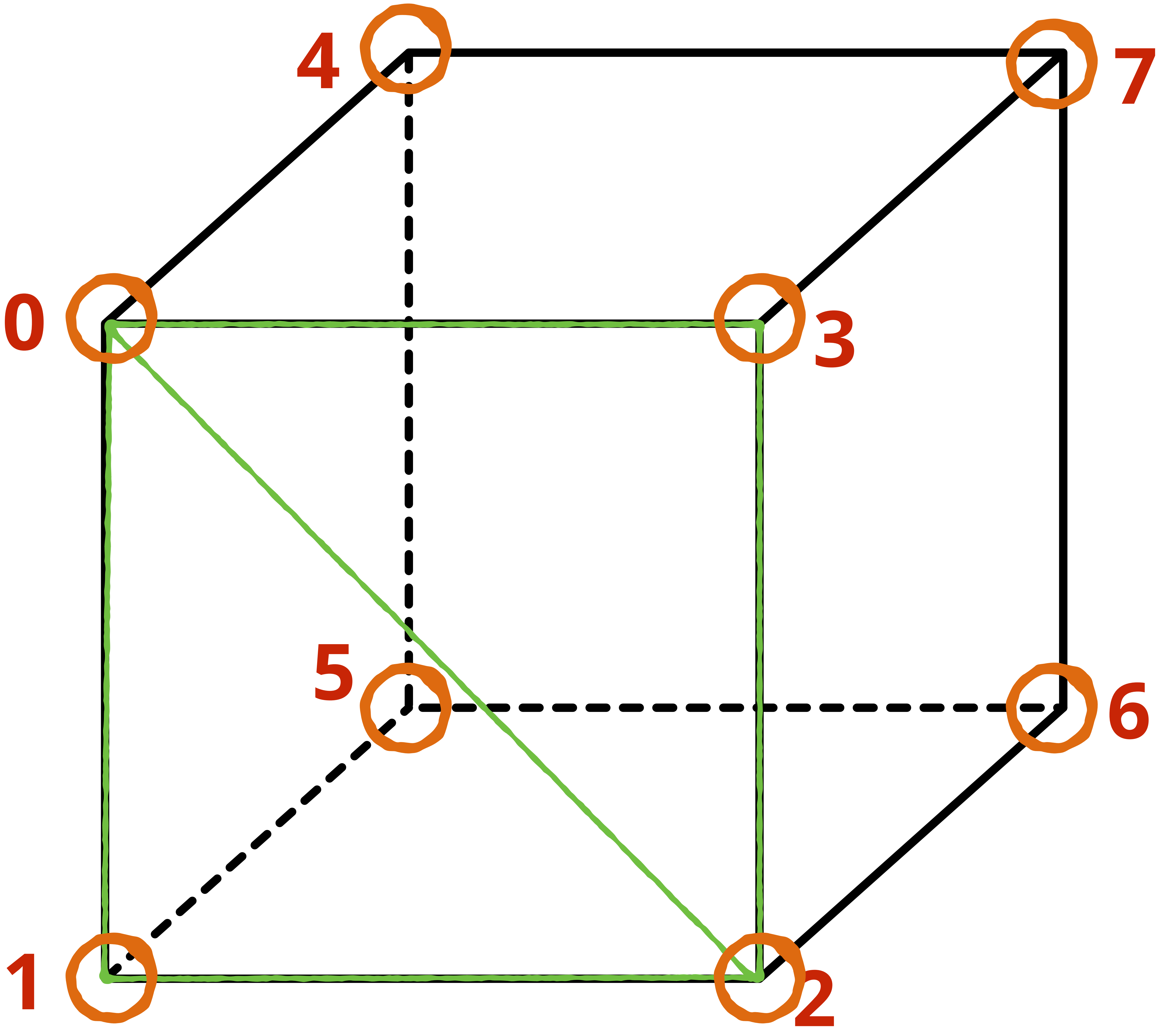
3D Models

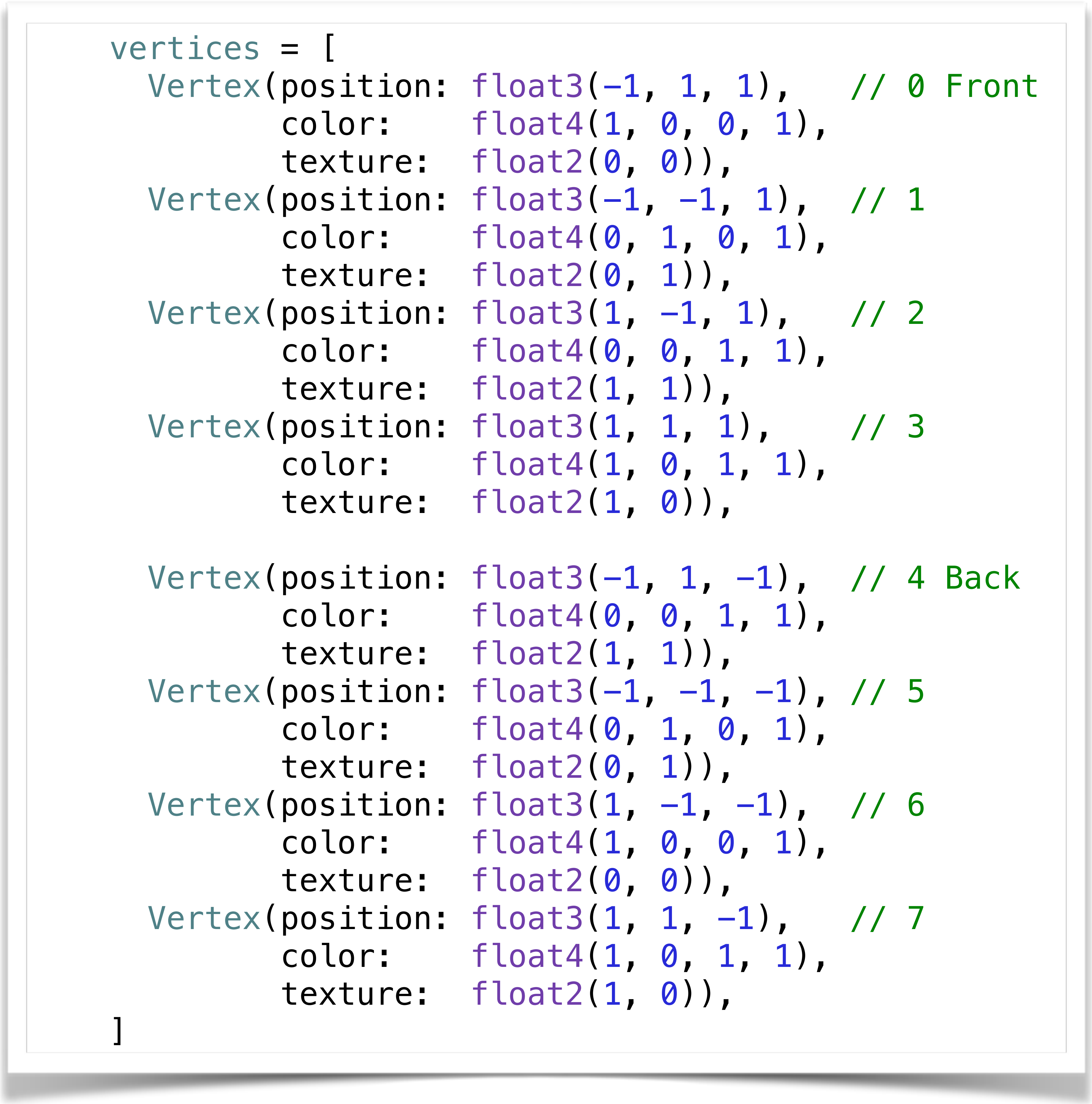




```
vertices = [
  Vertex(position: float3(-1, 1, 1),    // 0 Front
         color:    float4(1, 0, 0, 1),
         texture:  float2(0, 0)),
  Vertex(position: float3(-1, -1, 1),   // 1
         color:    float4(0, 1, 0, 1),
         texture:  float2(0, 1)),
  Vertex(position: float3(1, -1, 1),    // 2
         color:    float4(0, 0, 1, 1),
         texture:  float2(1, 1)),
  Vertex(position: float3(1, 1, 1),     // 3
         color:    float4(1, 0, 1, 1),
         texture:  float2(1, 0)),

  Vertex(position: float3(-1, 1, -1),   // 4 Back
         color:    float4(0, 0, 1, 1),
         texture:  float2(1, 1)),
  Vertex(position: float3(-1, -1, -1), // 5
         color:    float4(0, 1, 0, 1),
         texture:  float2(0, 1)),
  Vertex(position: float3(1, -1, -1),   // 6
         color:    float4(1, 0, 0, 1),
         texture:  float2(0, 0)),
  Vertex(position: float3(1, 1, -1),    // 7
         color:    float4(1, 0, 1, 1),
         texture:  float2(1, 0)),
]
```

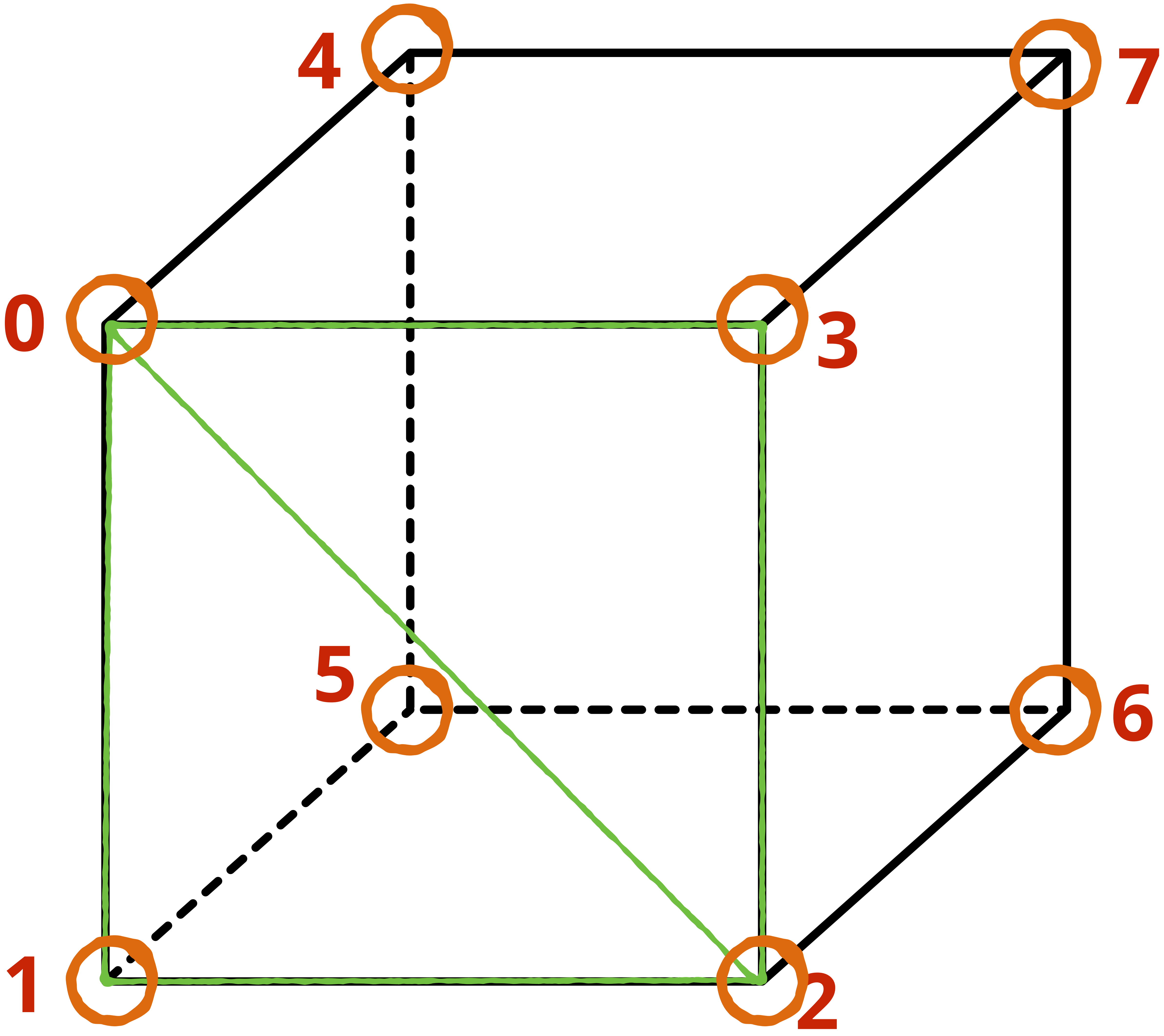
3D Models

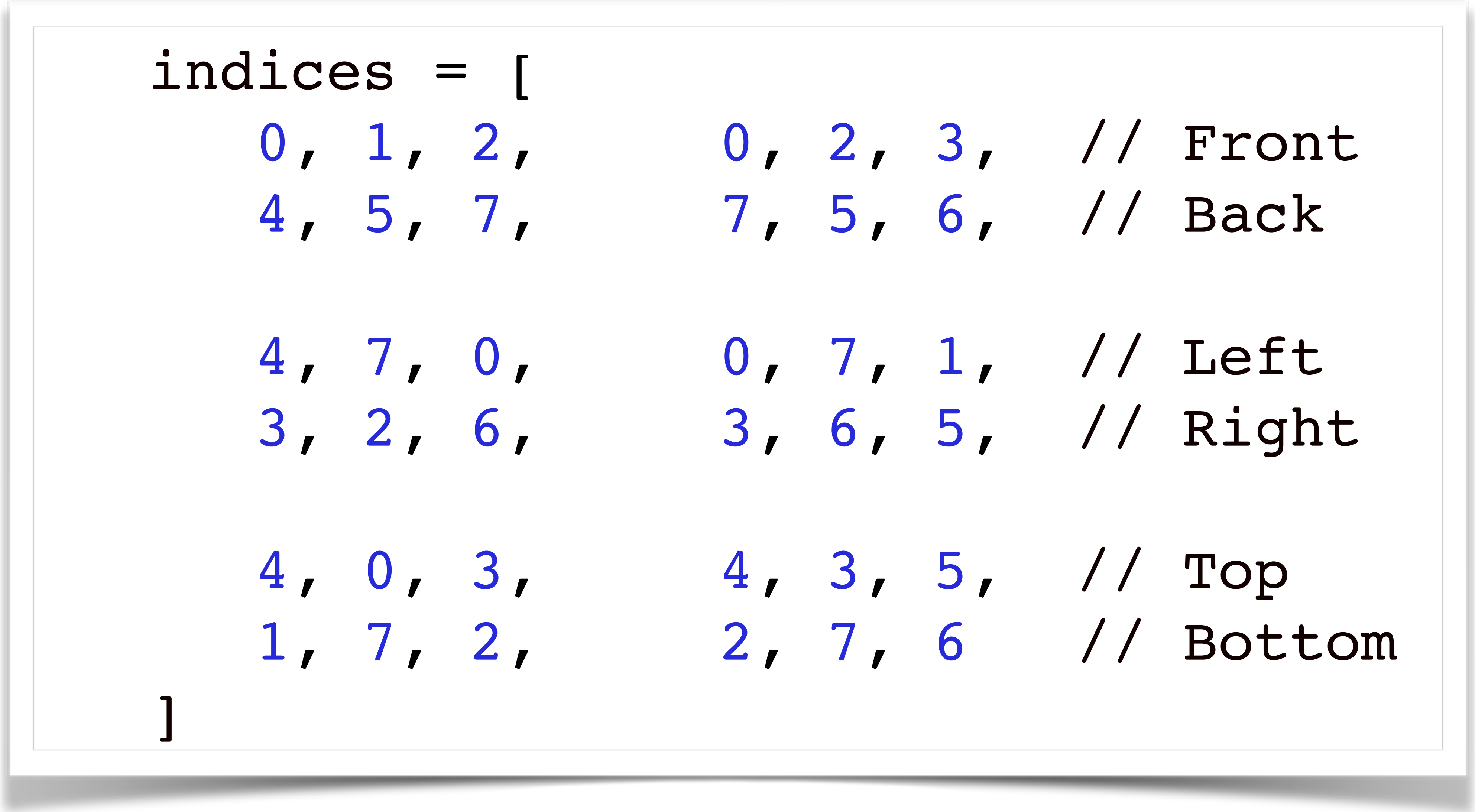




```
vertices = [
  Vertex(position: float3(-1, 1, 1),   // 0 Front
         color:    float4(1, 0, 0, 1),
         texture:  float2(0, 0)),
  Vertex(position: float3(-1, -1, 1),  // 1
         color:    float4(0, 1, 0, 1),
         texture:  float2(0, 1)),
  Vertex(position: float3(1, -1, 1),   // 2
         color:    float4(0, 0, 1, 1),
         texture:  float2(1, 1)),
  Vertex(position: float3(1, 1, 1),    // 3
         color:    float4(1, 0, 1, 1),
         texture:  float2(1, 0)),

  Vertex(position: float3(-1, 1, -1),  // 4 Back
         color:    float4(0, 0, 1, 1),
         texture:  float2(1, 1)),
  Vertex(position: float3(-1, -1, -1), // 5
         color:    float4(0, 1, 0, 1),
         texture:  float2(0, 1)),
  Vertex(position: float3(1, -1, -1),  // 6
         color:    float4(1, 0, 0, 1),
         texture:  float2(0, 0)),
  Vertex(position: float3(1, 1, -1),   // 7
         color:    float4(1, 0, 1, 1),
         texture:  float2(1, 0)),
]
```

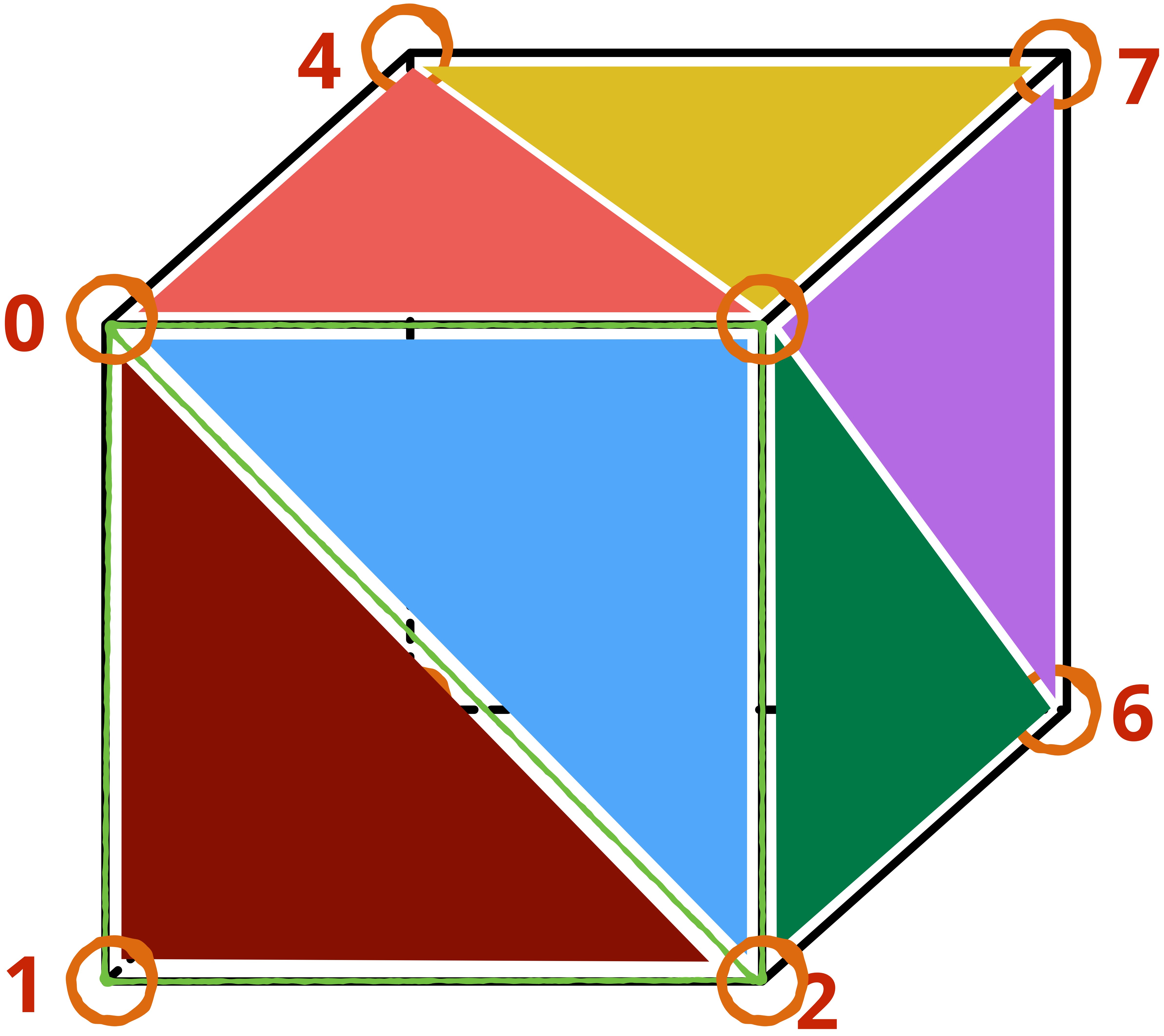
3D Models



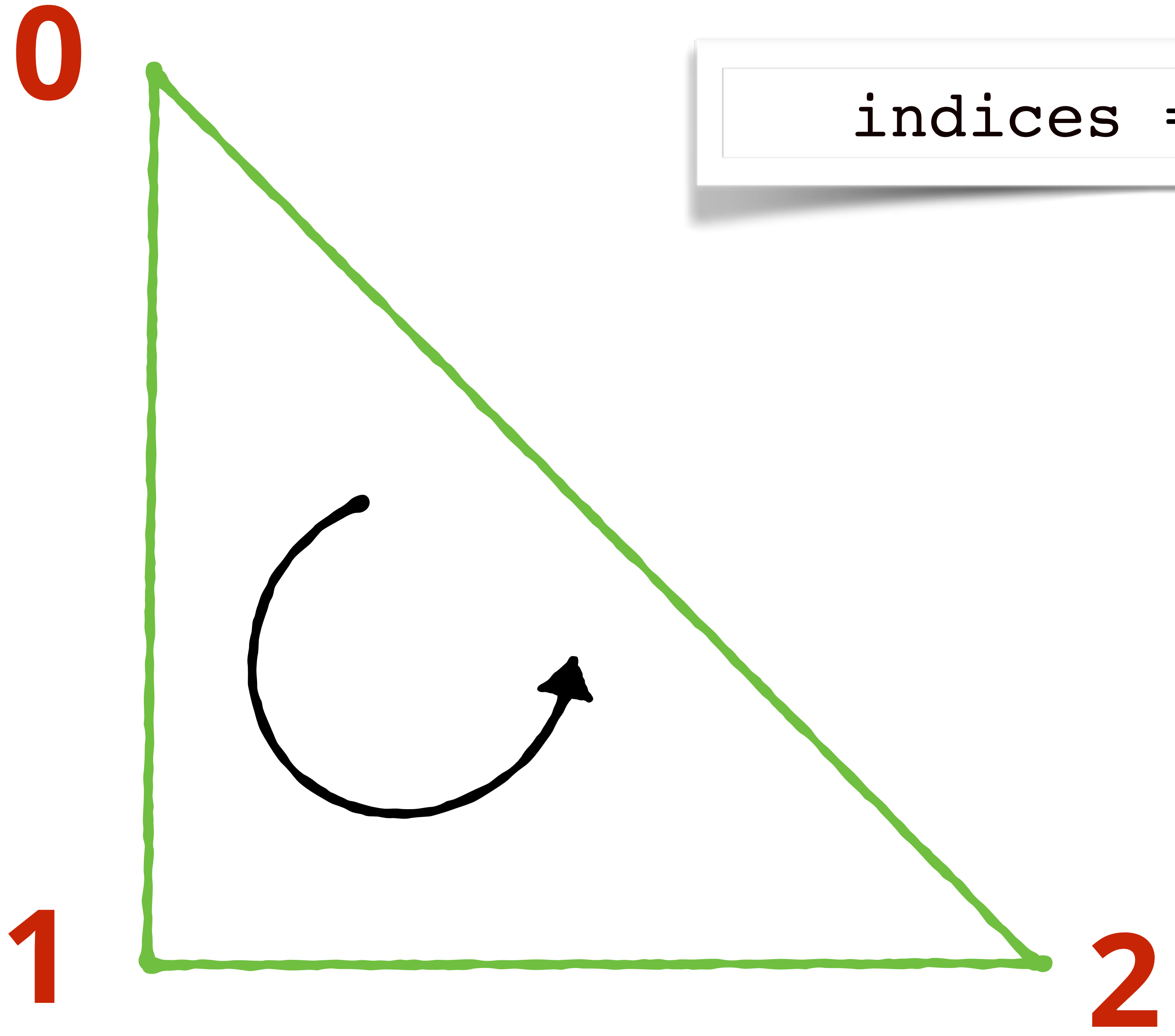


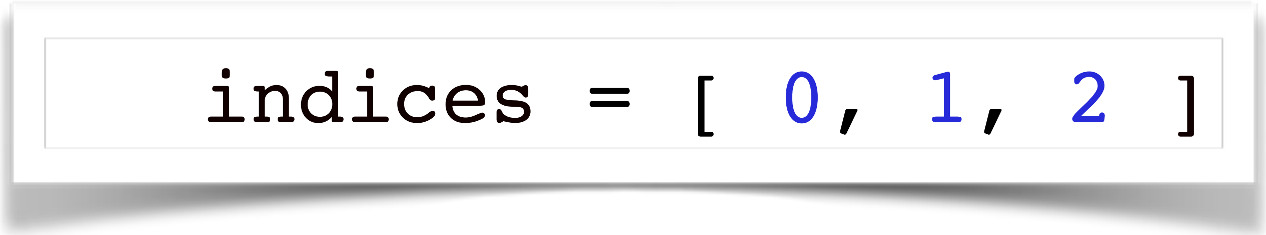
```
indices = [
    0, 1, 2,      0, 2, 3,    // Front
    4, 5, 7,      7, 5, 6,    // Back

    4, 7, 0,      0, 7, 1,    // Left
    3, 2, 6,      3, 6, 5,    // Right

    4, 0, 3,      4, 3, 5,    // Top
    1, 7, 2,      2, 7, 6     // Bottom
]
```

3D Models



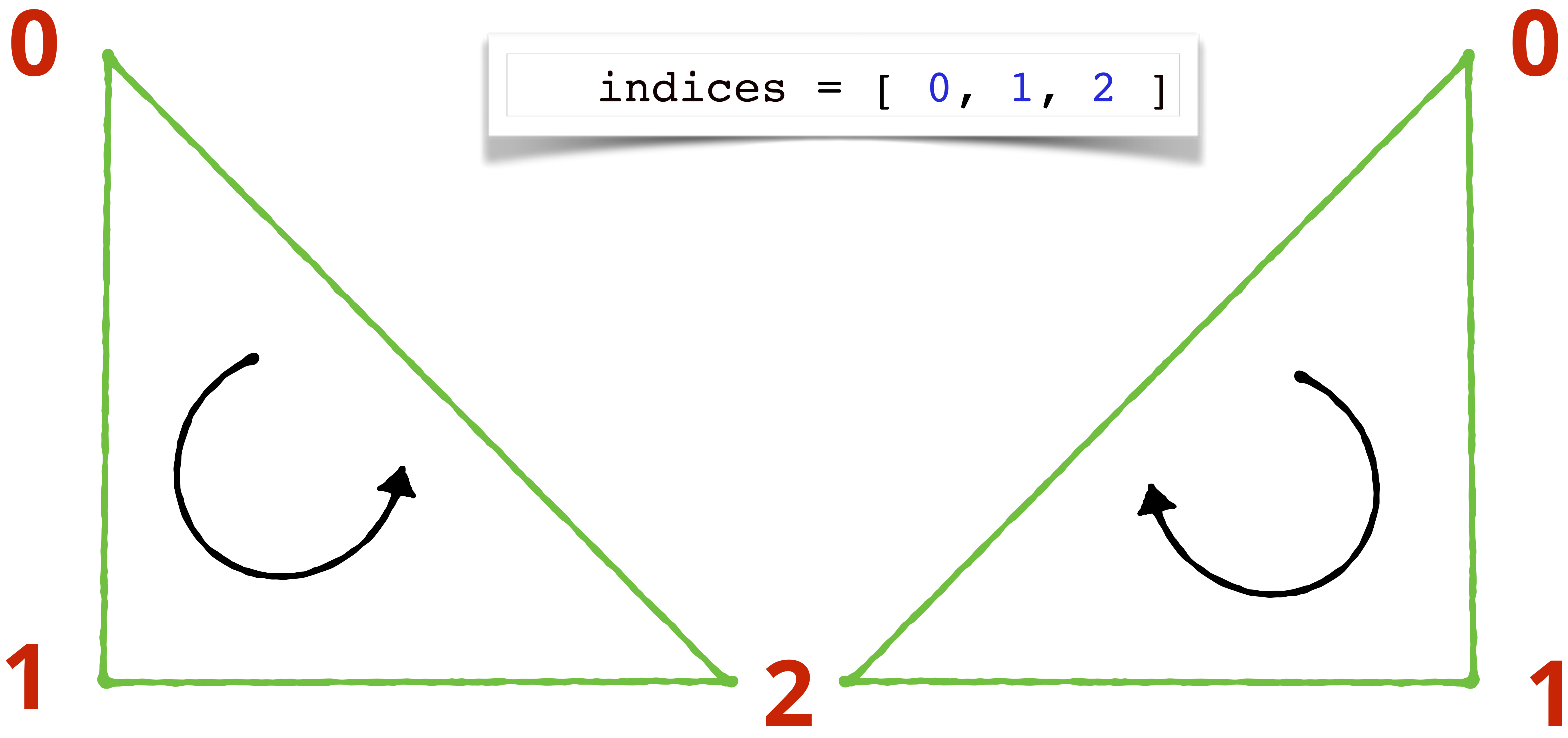
Back Face Culling





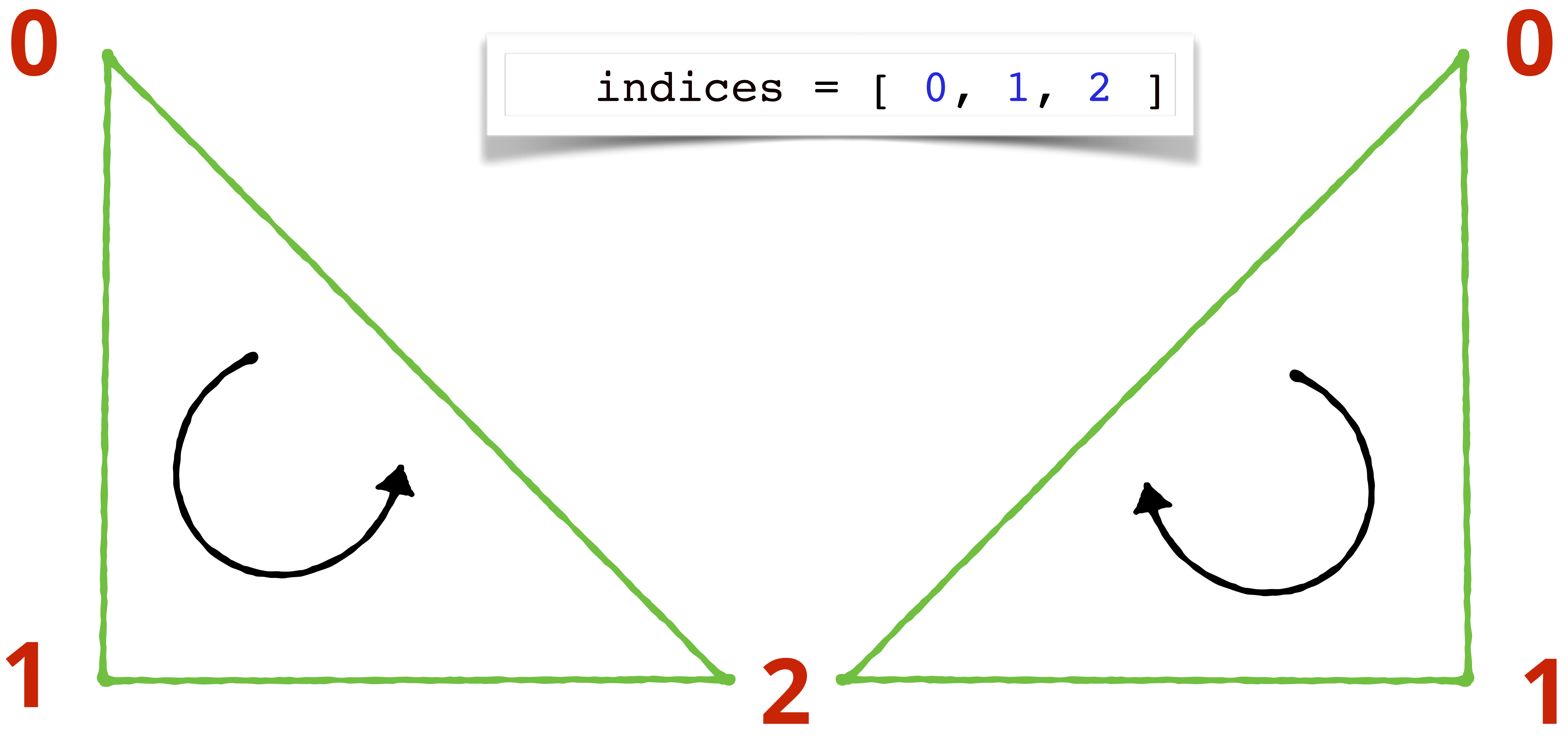
```
indices = [ 0, 1, 2 ]
```

Back Face Culling



```
indices = [ 0, 1, 2 ]
```

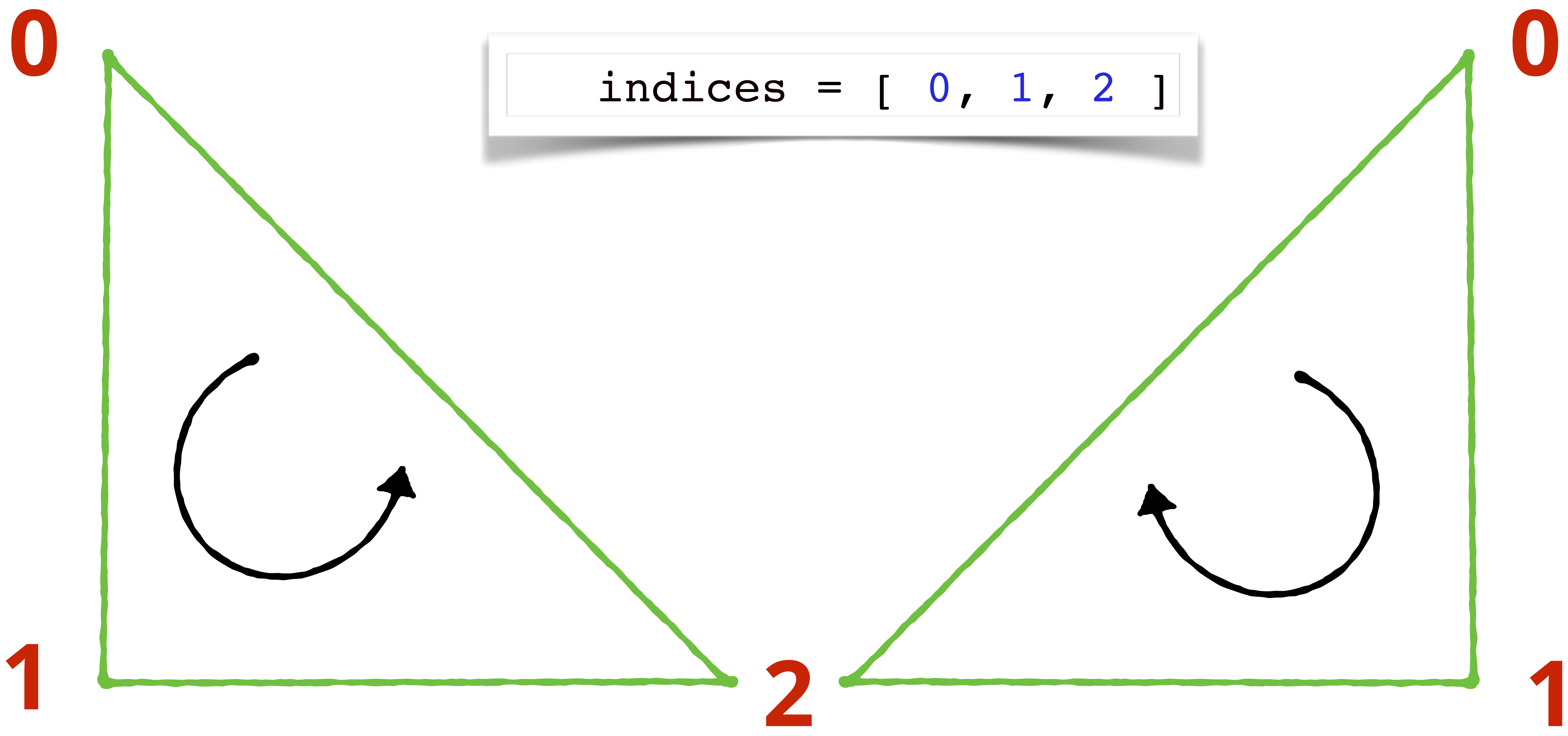
Back Face Culling



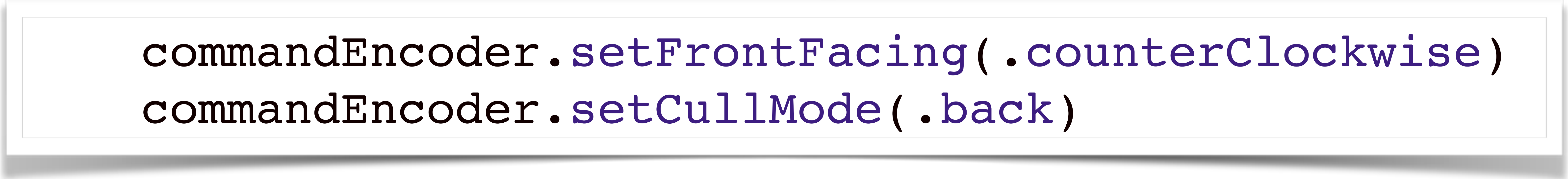
```
indices = [ 0, 1, 2 ]
```

```
commandEncoder.setFrontFacing(.counterClockwise)
```

Back Face Culling



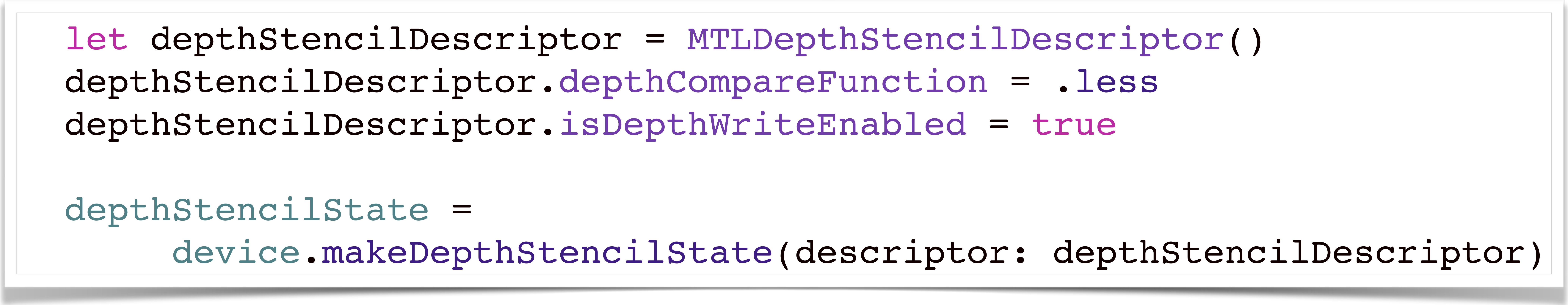
```
indices = [ 0, 1, 2 ]
```



```
commandEncoder.setFrontFacing(.counterClockwise)
commandEncoder.setCullMode(.back)
```

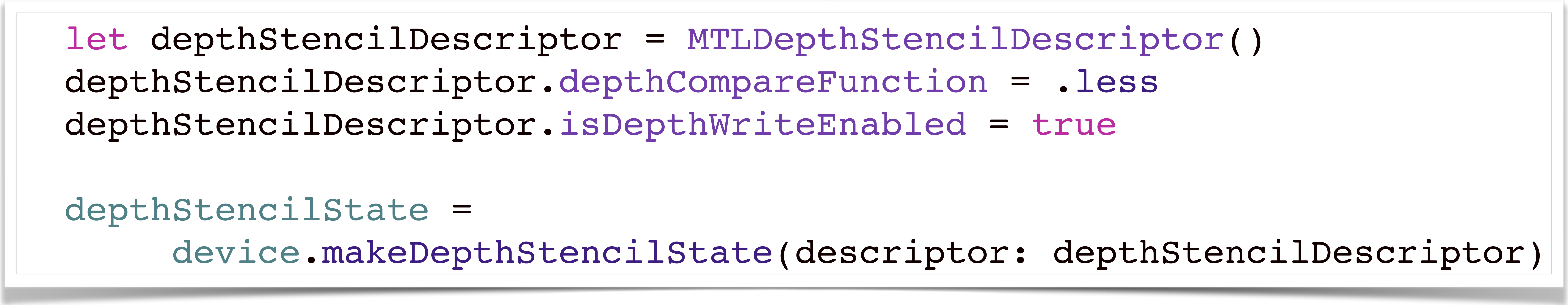
Depth Stencil State

Depth Stencil State

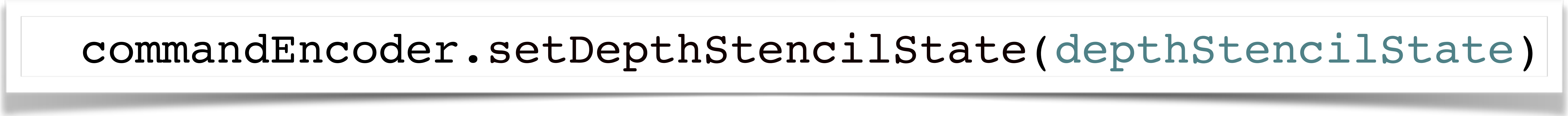


```swift
let depthStencilDescriptor = MTLDepthStencilDescriptor()
depthStencilDescriptor.depthCompareFunction = .less
depthStencilDescriptor.isDepthWriteEnabled = true

depthStencilState =
     device.makeDepthStencilState(descriptor: depthStencilDescriptor)
```

Depth Stencil State

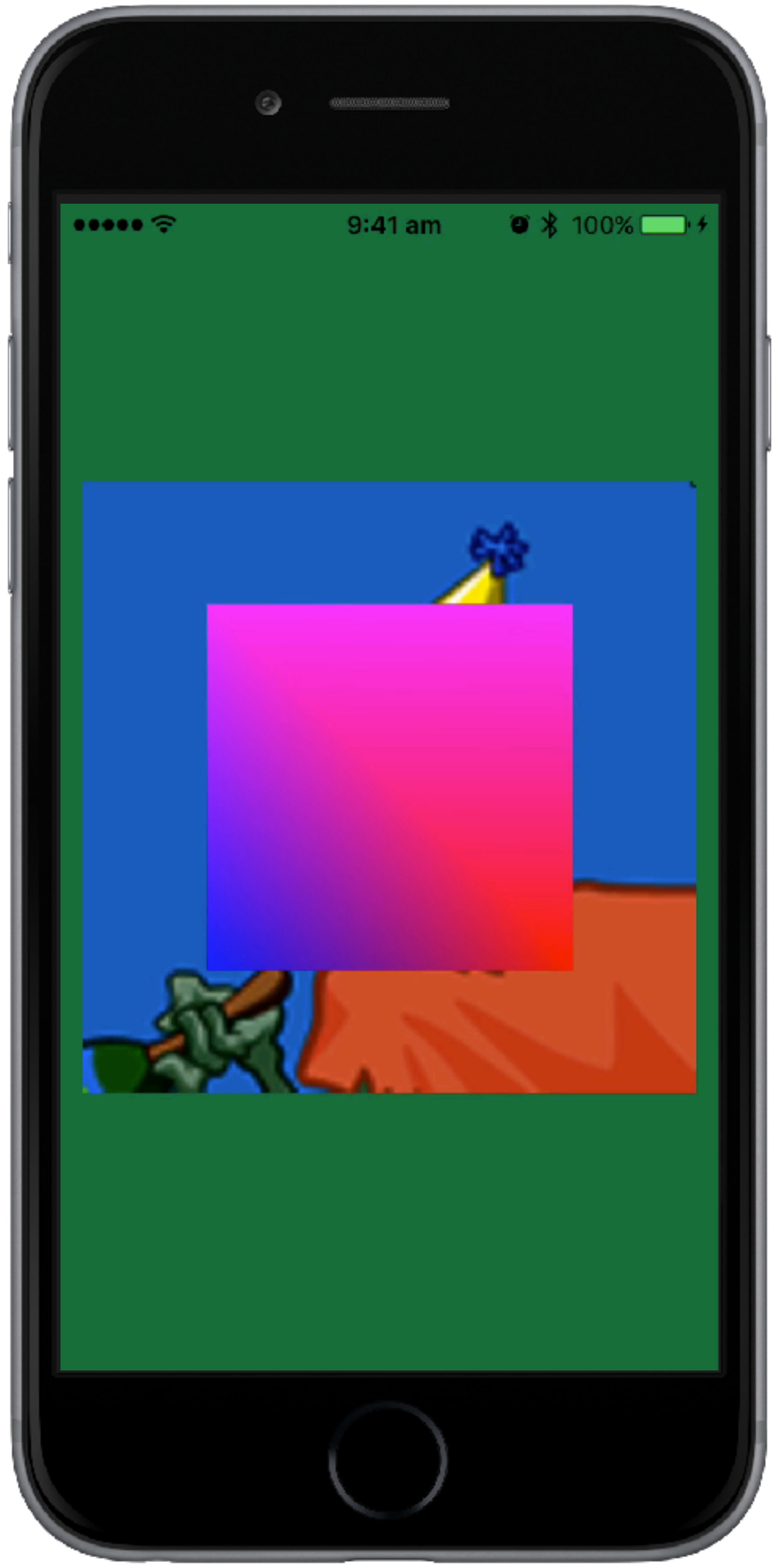


```swift
let depthStencilDescriptor = MTLDepthStencilDescriptor()
depthStencilDescriptor.depthCompareFunction = .less
depthStencilDescriptor.isDepthWriteEnabled = true

depthStencilState =
     device.makeDepthStencilState(descriptor: depthStencilDescriptor)
```

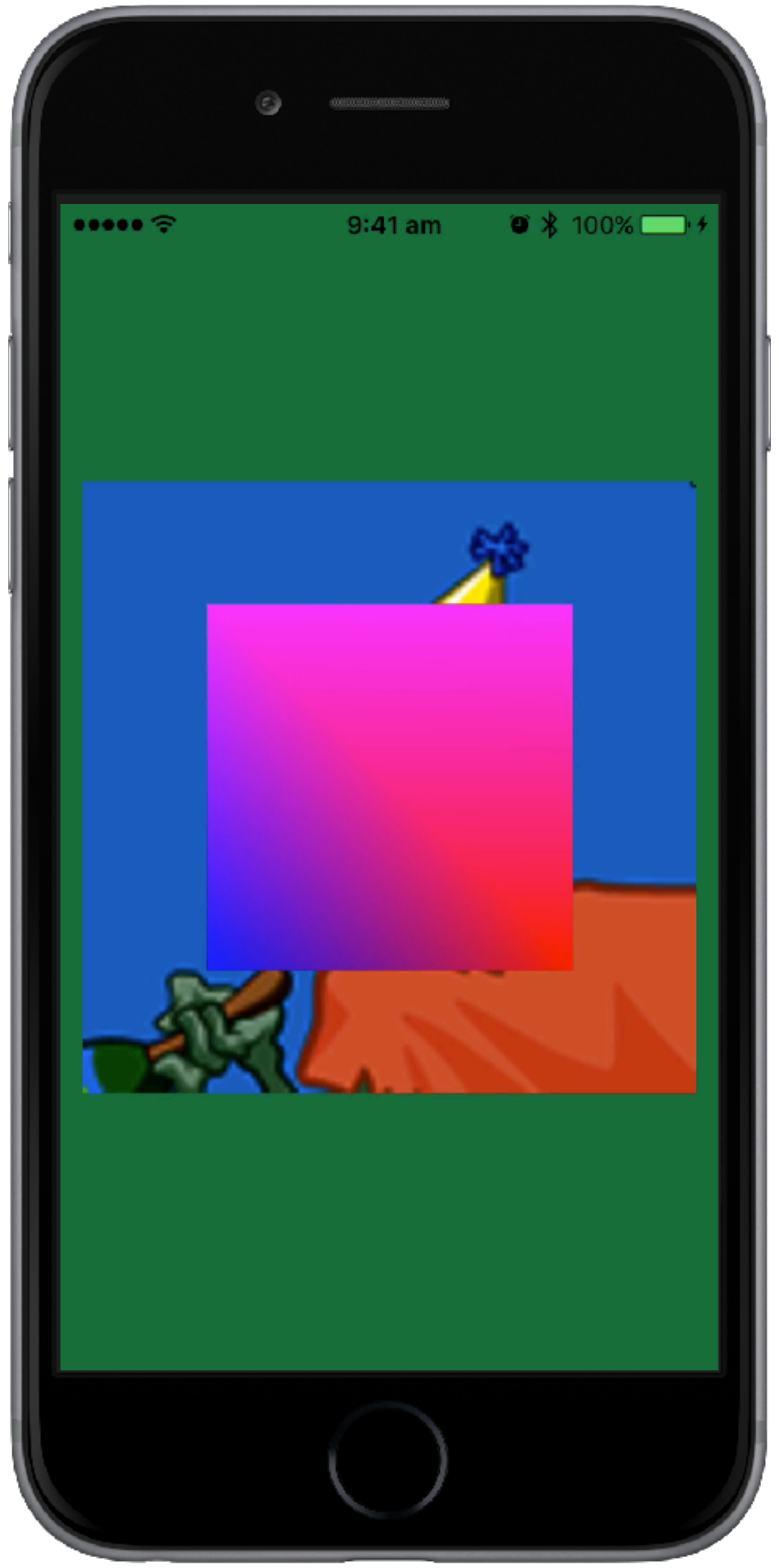


```swift
commandEncoder.setDepthStencilState(depthStencilState)
```

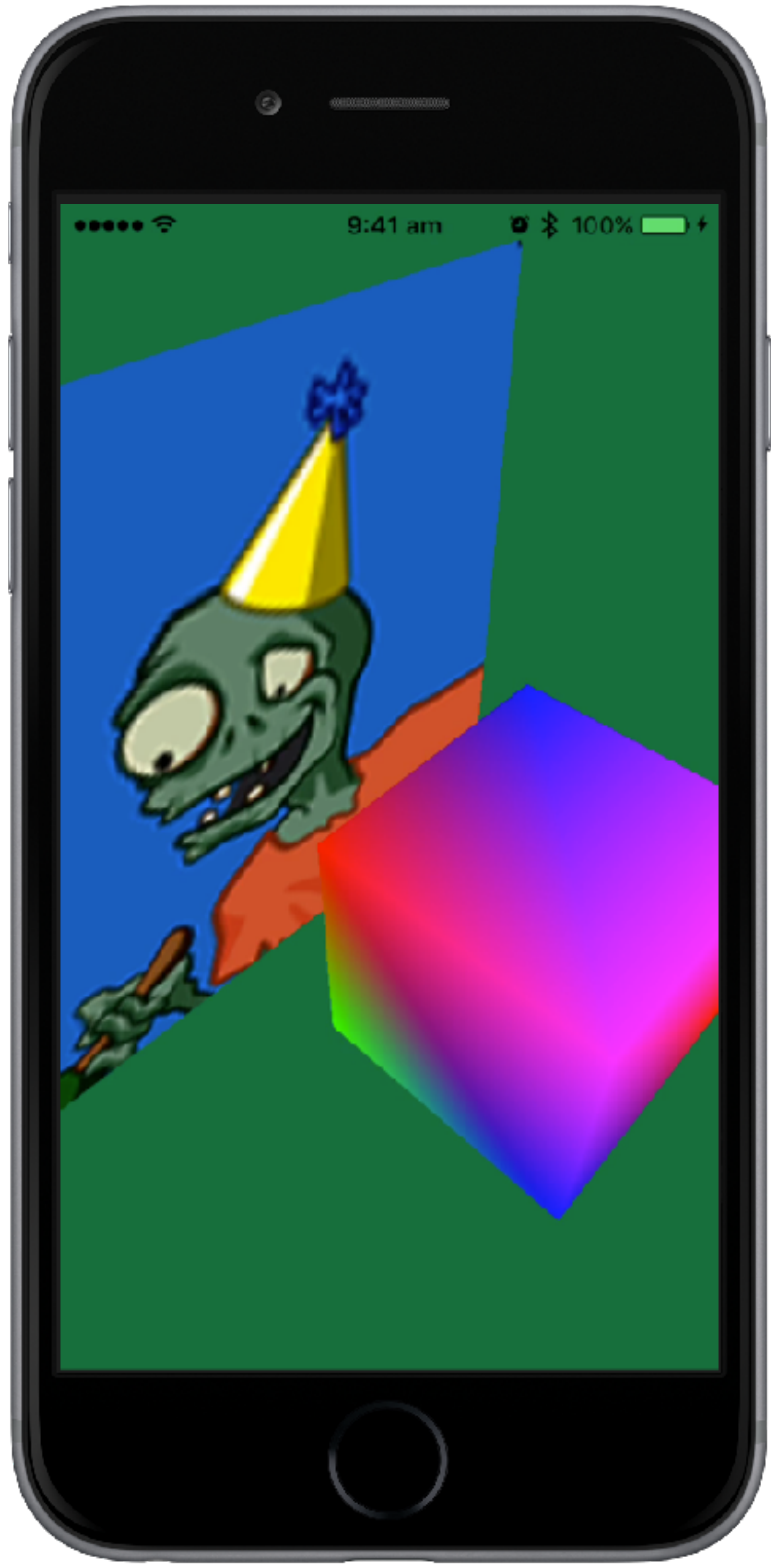
Demo



Demo



Challenge Time!



Challenge Time!