

.....

BEGINNING METAL

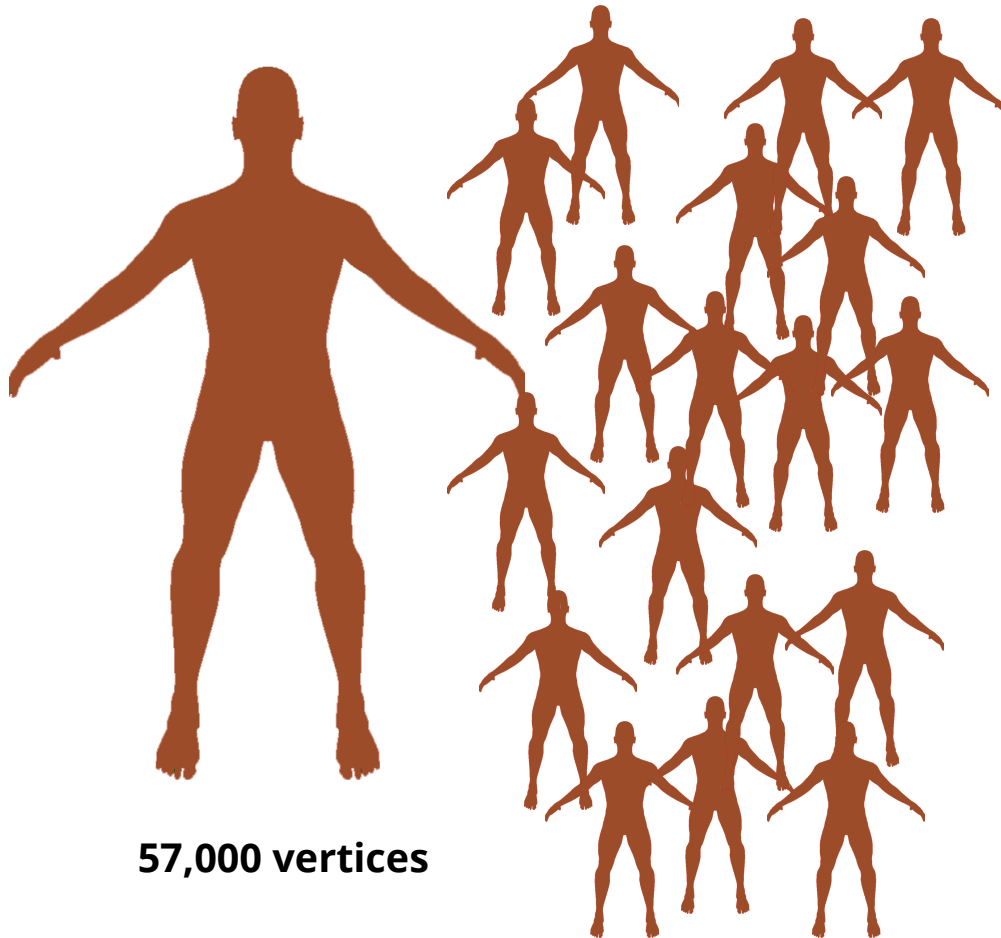
.....



PART 10: INSTANCING



WHAT IS INSTANCING



57,000 vertices

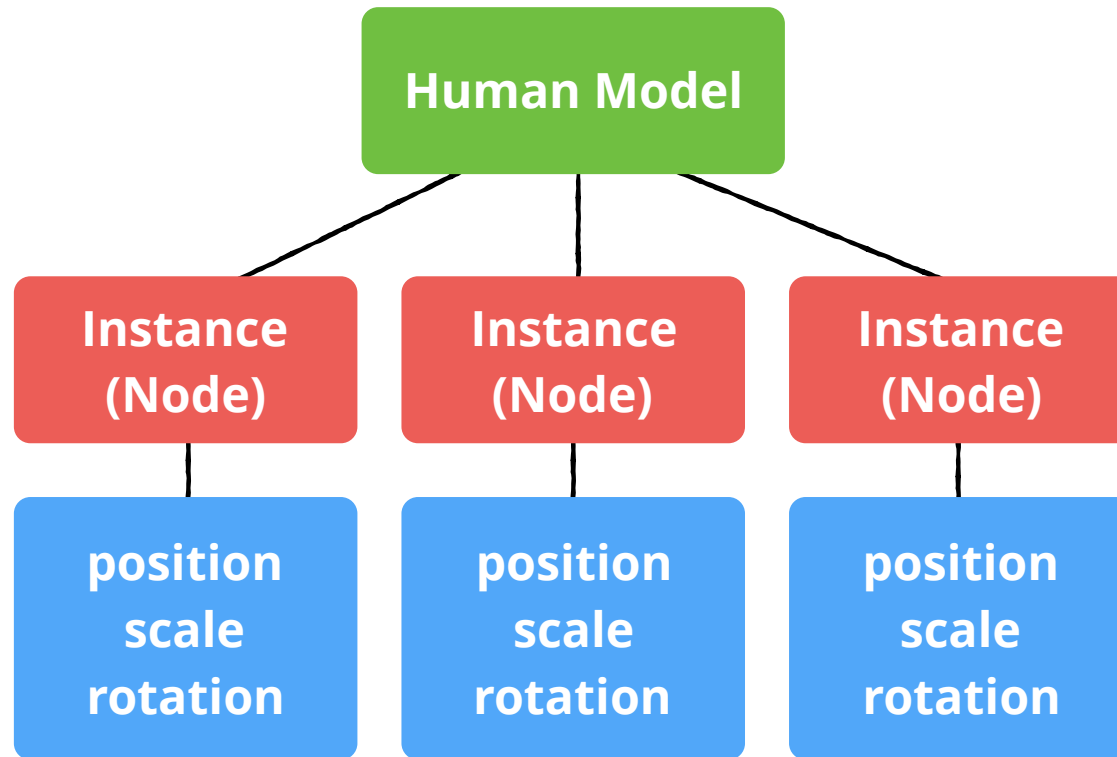


INSTANCING

```
commandEncoder.drawIndexedPrimitives(type: submesh.primitiveType,  
                                     indexCount: submesh.indexCount,  
                                     indexType: submesh.indexType,  
                                     indexBuffer: submesh.indexBuffer.buffer,  
                                     indexBufferOffset: submesh.indexBuffer.offset,  
                                     instanceCount: nodes.count)
```



INSTANCING



INSTANCING

```
instanceBuffer = device.makeBuffer(length: instanceConstants.count *  
    MemoryLayout<ModelConstants>.stride, options: [])
```

```
commandEncoder.setVertexBuffer(instanceBuffer, offset: 0, at: 1)
```

```
vertex VertexOut vertex_instance_shade(const VertexIn vertexIn [[stage_in]],  
    constant ModelConstants *instances [[buffer(1)]],  
constant SceneConstants ssceneConstants [[ buffer( ) ]],  
    uint instanceId [[instance_id]]) {
```



DEMO



CHALLENGE TIME!

