USING OBJECTION FILES WITH VULKAN
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3D MODEL FORMATS
• MANY DIFFERENT FORMATS (STL, .AMF, .X3D, .OBJ, .3DS, .BLEND, .SKP, .OFF, .PLY)
• HOLDS ALL DATA NECESSARY TO PRODUCE A MODEL
• WE CARE ABOUT: VERTEX, NORMALS, TEXTURE COORDINATES, FACES

WAVEFRONT OBJECTION FILE STRUCTURE
• Plain text ASCII (.OBJ) OR binary (.MOB)
• Simple and well documented format
• Scales with Complexity

Source: http://paulbourke.net/dataformats/obj/

WAVEFRONT OBJECTION FILE STRUCTURE: CUBE

Source: http://paulbourke.net/dataformats/obj/

SETUP
1. Move Vertex struct into separate header VERTEX_H
2. Create model struct MODEL_H
3. Parse OBJ file with LOADOBJ.CPP
4. Modify sample code
5. Choose a model

STEP 1:

Example code for loading and using an OBJ file in Vulkan.
STEP 2: ORIGINAL CODE

```cpp
struct model {
    std::vector<float> vertices;
    std::vector<int> indices;
};
```

STEP 3: PARSING OBJ FILE

```cpp
struct model LoadObjFile(const char* filename) {
    std::ifstream file(filename);
    std::string line,
    while (std::getline(file, line)) {
        if (line[0] == '#') continue;
        if (line[0] == 'v') {
            std::istringstream iss(line);
            iss >> vertex.x >> vertex.y >> vertex.z;
            vertices.push_back(vertex.x);
            vertices.push_back(vertex.y);
            vertices.push_back(vertex.z);
        }
    }
    return model {
        vertices
    };
}
```

STEP 4: MODIFY SAMPLE CODE

1. Remove struct vertex from Sample.cpp (since structs for this application section)
2. Remove warn.h
3. Remove includes “warn".
4. Under application-related global variables add
   ```
   struct vert;
   ```
5. Define `size = sizeof(struct vertex);`

STEP 5: CHOOSE A MODEL

1. 3D Models can be downloaded:
   ```
   - Free 3D Models: https://www.tinyegl.com
   ```

THIRD PARTY LIBRARIES & SOURCE

- **Source Code:**
  ```
  https://github.com/CarvellWakeMan/vulkan_loadobjfile
  ```
- **Third Party Library:**
  ```
  https://github.com/DavidWittman/tinyobjloader
  ```
- **Create an OBJ model in Blender:**
  ```
  https://www.createmesh.com/blend/3D-Model
  ```