CSE 167 (WI 2026) Exercise 1 — Due 1/16/2026

A *vertex array object* is a spreadsheet that contains the information about the geometry and apparence of the shape we want to render. The vertex array object consists of one or few *vertex buffers* containing vertex attributes (numbers sitting on vertices) and an *index buffer* that describes how the vertices are connected into triangles.

For a simple example (*e.g.* `HelloSquare.cpp` in Programming HW0 ignoring the color attributes), the following list of 2D coordinates and indices will be parsed by the shaders and rasterizers to produce a square.

$$\text{VertexBuffer} = (-0.5, -0.5, 0.5, -0.5, 0.5, 0.5, -0.5, 0.5);$$
$$\text{IndexBuffer} = (0, 1, 3, 2, 3, 1).$$

To clarify a possible ambiguity: the vertex buffer is parsed by the vertex shader as input variable of type **vec2**.

Exercise 1.1 Modifying only the above buffers, what would be a possible list of numbers in the buffers that would give rise to the shape on the right? (The lengths of the above arrays may be modified.)

```
VertexBuffer = (-0.625, 0.75,
                -0.25, 0.25,
                0.25, 0.25,
                0.625, 0.75,
                0.625, -0.625,
                -0.625, -0.625)
```

VertexBuffer =? IndexBuffer =?

```
IndexBuffer = (1,0,5,
               1,5,4,
               2,1,4,
               2,4,3)
```