Computer Graphics
Theory and Applications

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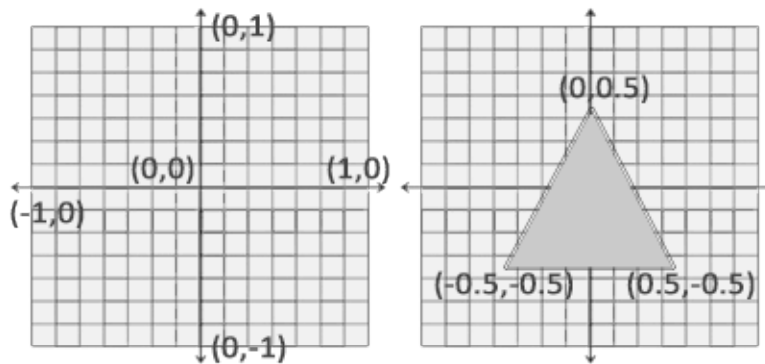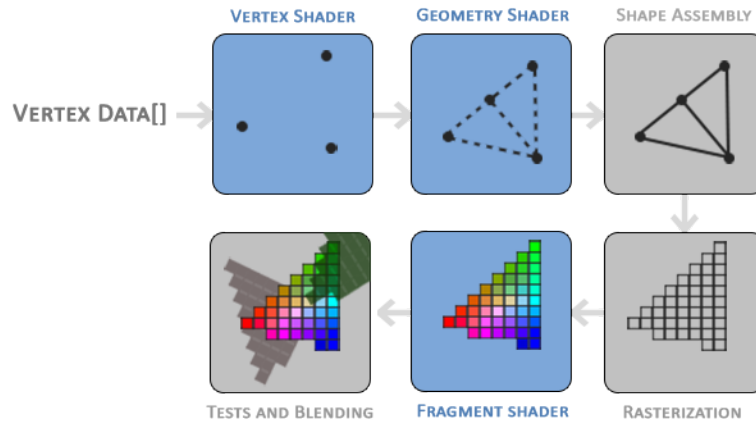
Contents

1 OpenGL

1.1 Normalized Device Coordinates (NDC)

In Normalized Device Coordinates, x, y and $z \in [-1, 1]$. This is the default coordinate system in OpenGL. The following image shows the NDC space.
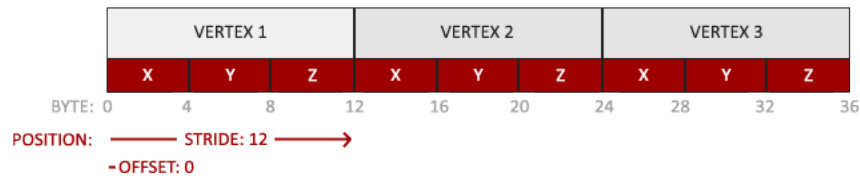

1.2 Graphics Pipeline

The order with which OpenGL proccesses vertex data:

1.3 Vertex Buffer Data

Vertex attributes are stored in the following order:

Vertices are stored in the Vertex Buffer Object (VBO).

1.4 VBO, VAO, EBO

- **VBO** stores vertex data (e.g., positions, normals, colors) in GPU memory. It allows efficient transfer of vertex data to the GPU, enabling faster rendering. You bind a VBO and then specify the vertex data using functions like glBufferData.

- **VAO** stores the configuration of vertex attributes and their associated buffers. It simplifies the process of switching between different vertex data configurations. When you bind a VAO, it automatically sets up the vertex attribute pointers and buffer bindings.

- **EBO** stores indices that define the order in which vertices should be drawn. It helps in reducing the amount of vertex data needed by reusing vertices. You bind an EBO and specify the indices using functions like glBufferData.

1.5 Hello Window

You can find the whole source code for the Hello Window here.

1.6 Hello Triangle

The whole source code for the Hello Triangle can be found here.