Drawing a Circle

Lecture 10

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Outline

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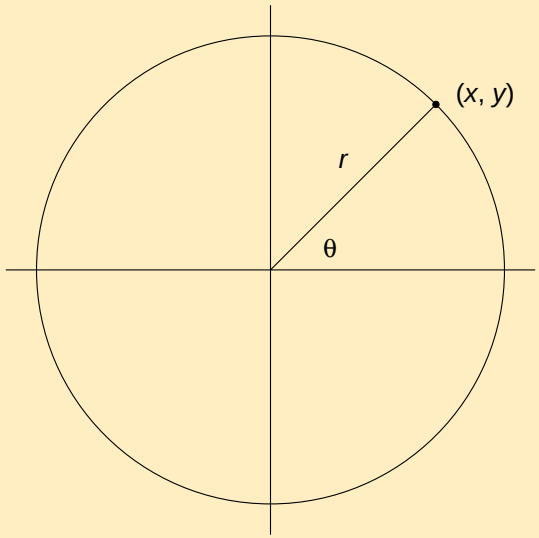
Drawing a Circle

Drawing a Circle



- The coordinates of points on a circle of radius r are

$$(r\cos\theta, r\sin\theta)$$

for $0 \leq \theta \leq 2\pi$.

Drawing a Circle

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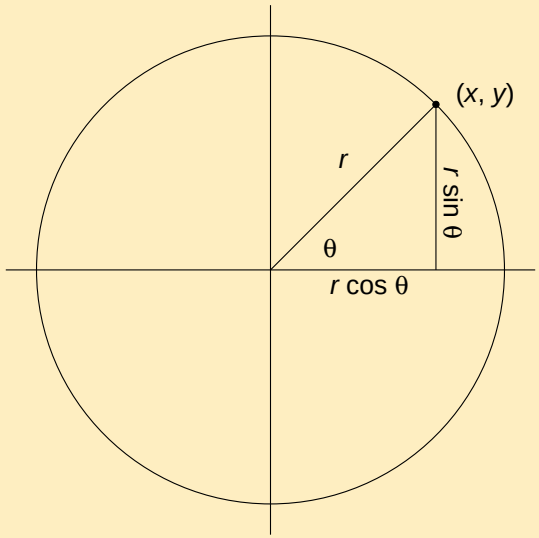


- The coordinates of points on a circle of radius r are

$$(r\cos\theta, r\sin\theta)$$

for $0 \leq \theta \leq 2\pi$.

Outline

Drawing a Circle

- Rather than draw a true circle, we draw a regular polygon with so many sides that it is indistinguishable from a circle.
- It is not practical to enter manually the coordinates of the points on a circle.
- We have to use the formulas

$$x = r\cos\theta$$
$$y = r\sin\theta$$

Dynamic Circles

- Suppose we want to change the number of sides.
- Then the size of the array will change, so we must use dynamic allocation of memory.
- And we must update the data in the VBO.

Updating the Buffer Data

Updating the Buffer Data

```
void createCircle()
{
        ⋮
    glNamedBufferStorage(VBO[CircleBuffer],
        size*sizeof(GLfloat), circle_data,
            GL_DYNAMIC_STORAGE_BIT);
        ⋮
}
```

- When we create the buffer, we must specify that the data are dynamic.
- The default is static.

Updating the Buffer Data

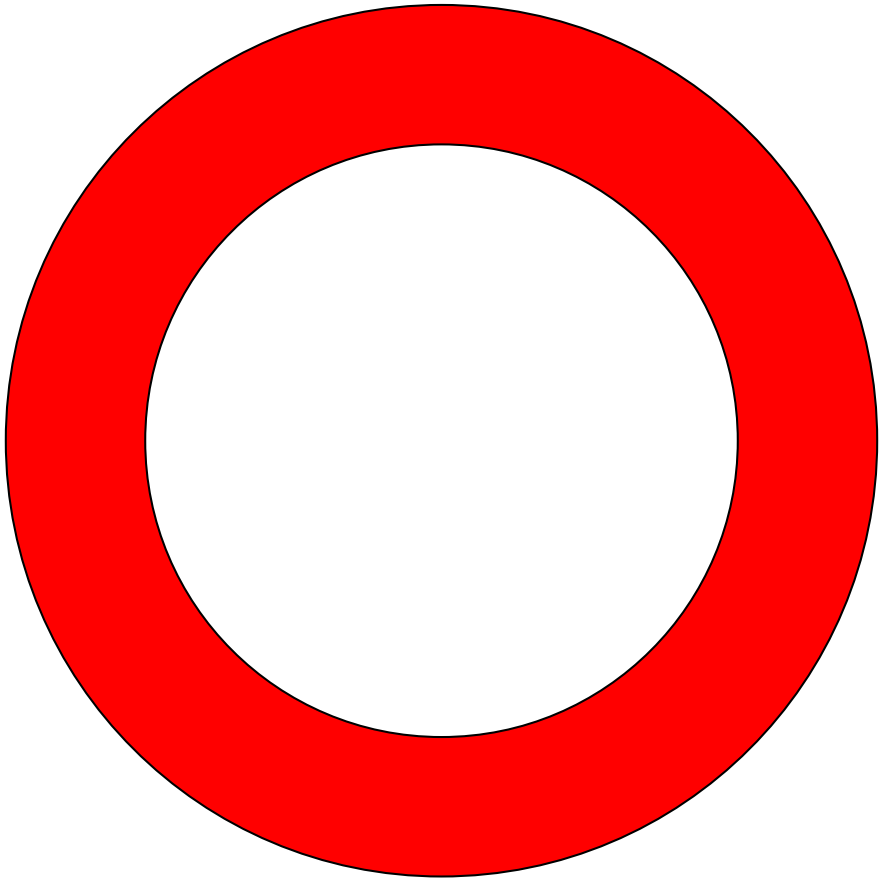
Updating the Buffer Data

```
void updateCircle()
{
        ⋮
    glNamedBufferSubData(VBO[CircleBuffer], 0,
        size * sizeof(GLfloat), circle_data);
        ⋮
}
```

- The update function is nearly identical to the create function, except that it uses `glNamedBufferSubData()` instead of `glNamedBufferStorage()`.

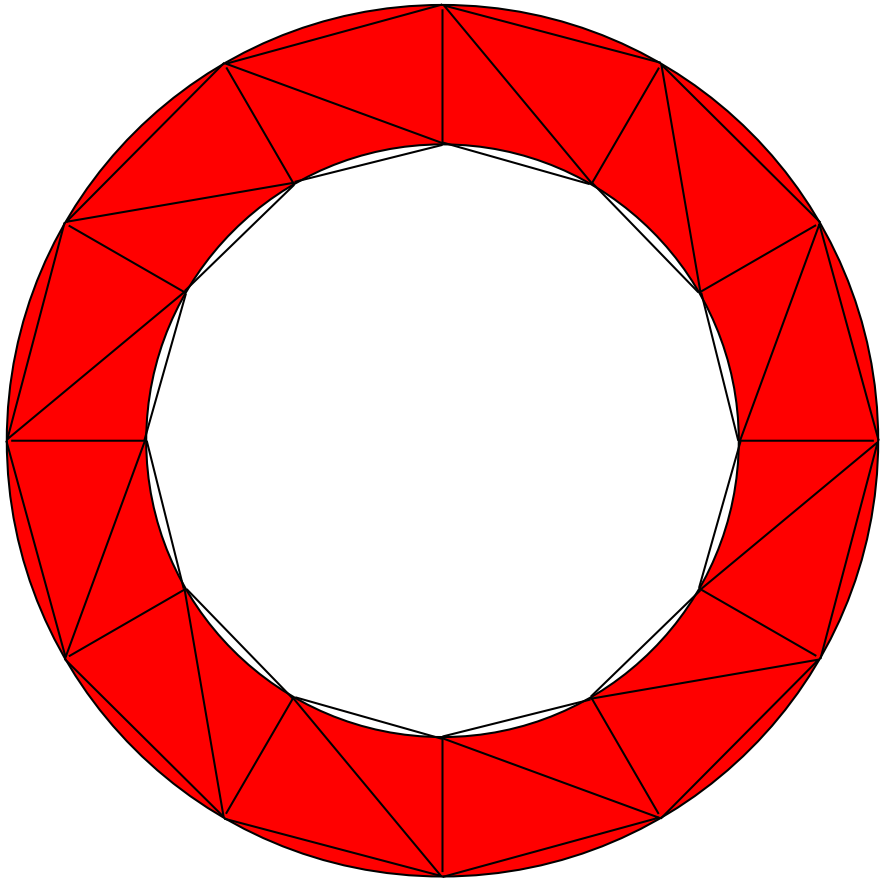
Outline

Drawing Rings



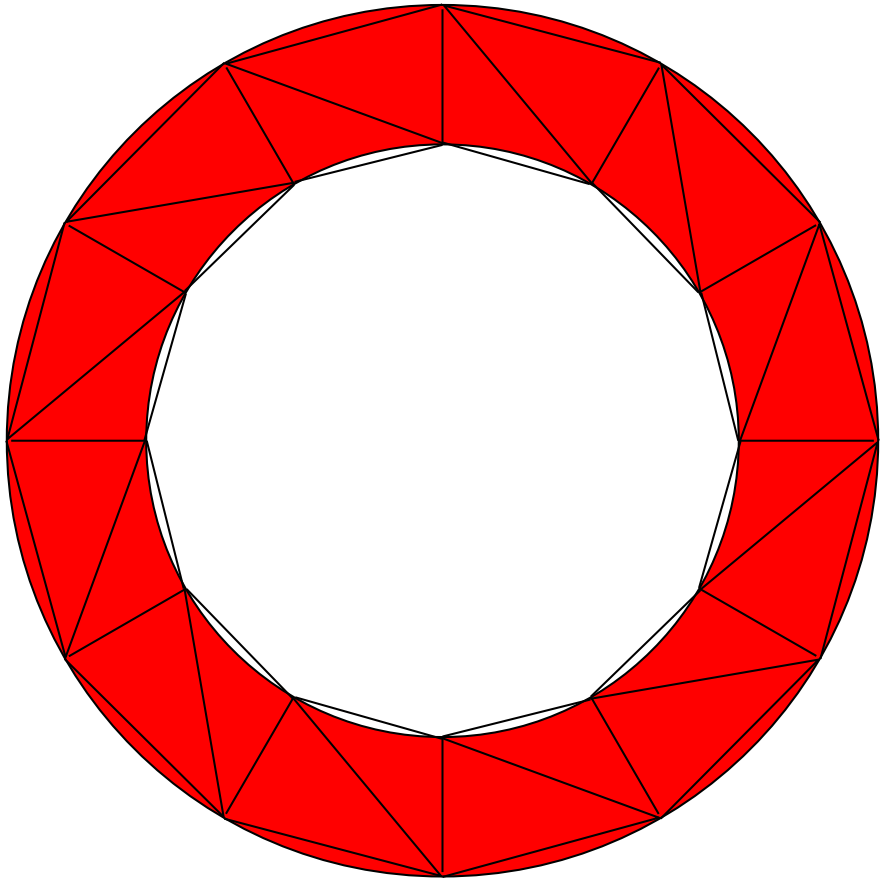
An annular region is the strip that lies between two concentric circles.

Drawing Rings



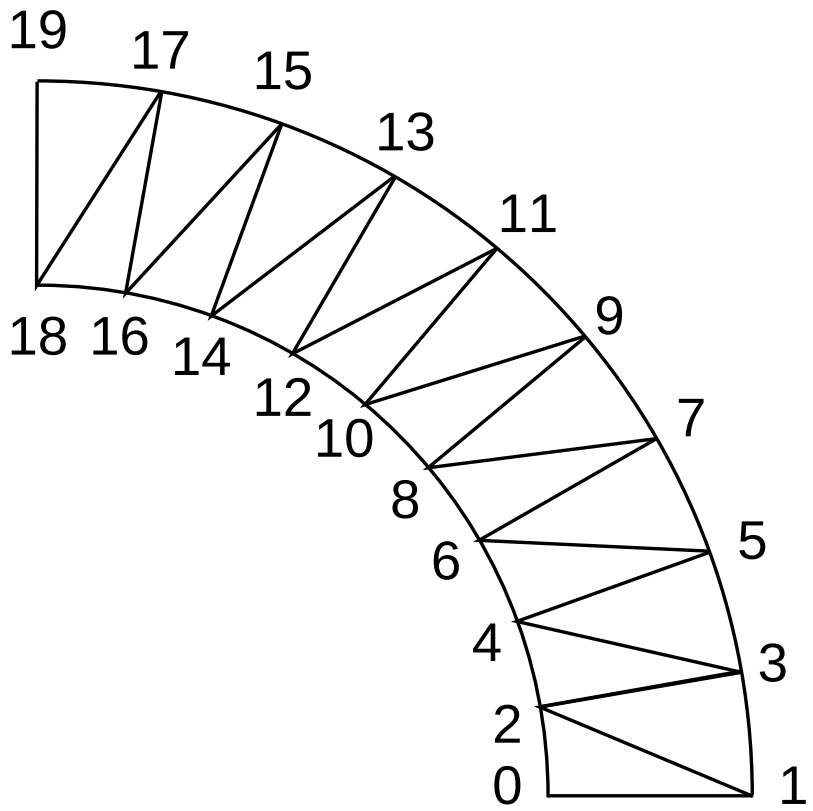
To draw such a strip, we should use a triangle strip.

Drawing Rings



Why not draw the larger red circle and overlay it with a smaller white circle?

Drawing Rings



The indexing of the vertices of a triangle strip

Outline

Assignment

Assignment

- Assignment 9.