

The aim of the lab is to understand how to model geometric shapes using distance functions and how to visualize function represented geometric objects using raytracing method. The lab exercises are set directly based on some tutorials in ShaderToy.com. You can either do the lab on Shadertoy.com or do it with RenderMonkey.

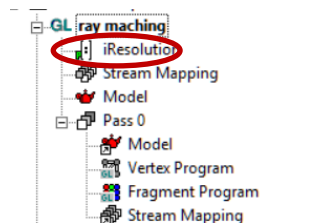
If you intend to do it on ShaderToy, just go to <https://www.shadertoy.com/> and create an account of your own if you are a new user.

If you want to do the exercises with RenderMonkey please follow the instructions described below.

1. Start from the default OpenGL Position effect.
2. Open vertex shader and replace the code with the following:

```
void main(void)
{
    gl_Position = vec4(sign(gl_Vertex.xy), 0.0, 1.0);
}
```

3. Create a 2D vector variable with name “iResolution”:



4. Open pixel shader and replace the original code with the following:

```
uniform vec2 iResolution;

void mainImage( out vec4 fragColor, in vec2 fragCoord )
{
    fragColor = vec4(0.2, 0.5, 0.5, 1.0);
}

void main(){

    mainImage(gl_FragColor, gl_FragCoord.xy);

}
```

Exercise 1. Drawing a disc.

Please follow the tutorials shown in ShaderToy at.

<https://www.shadertoy.com/view/lt3R4> (Links to an external site.)Links to an external site.

Exercise 2. Construct complex geometries following the idea of CSG.

Please follow the tutorials shown in ShaderToy at

<https://www.shadertoy.com/view/4tcGDr>

Exercise 3. Draw more distance function described objects.

Please refer to the following webpage on how to model different geometric primitives using distance functions:

<https://iquilezles.org/www/articles/distfunctions/distfunctions.htm>

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Mar. 25, 2019.