In this assignment, I researched how to set the direction of the water. What is worth talking about is the key point in this assignment is how to process information between C# scripts, shaders, and the render. Firstly, I will share you how to exchange the get information from shader in scripts.

```
Renderer rend = GetComponent<Renderer>();
rend.material.shader = Shader.Find("Unlit/Flow");
Debug.Log(rend.material.GetFloat("_Alpha"));
```

You should get your own path to use in "`Shader.Find("")`. Moreover, you need use different functions to get the variables, such as "`GetInt("")`". Then, let's talk about how to sent values to shader in scripts.

In shaders:

```
uniform int _keyNum;
uniform float4 _keyPos[100];
```

In scripts:

```
var keyPos = new Vector4[KeyPoint.Count];
...
rend.material.SetInt("_keyNum", KeyPos.Count);
rend.material.SetVectorArray("_keyPos", keyPos);
```

The name of the variables in shaders must keep the same with the stings in scripts. Now, we can consider how to get the direction of the water.

In order to deal with it, I set some key points and mark the direction of water on these points. Moreover, I sent these points' position and direction to shader as following sentences.

```
Shader.SetGlobalVectorArray("_keyPos", keyPos);
Shader.SetGlobalVectorArray("_keyDir", keyDir);
```

Then, when I deal with different points on the object which uses the shader of water, I will get the world position first in "vert" function.

```
o.worldPos = mul(unity_ObjectToWorld, v.vertex).xyz;
```

Now, we know that the point coordinate. What we should do is to compare the value on x-axis and get the neighbouring key points. Then according to the direction of key points, we can get the direction of present point now.