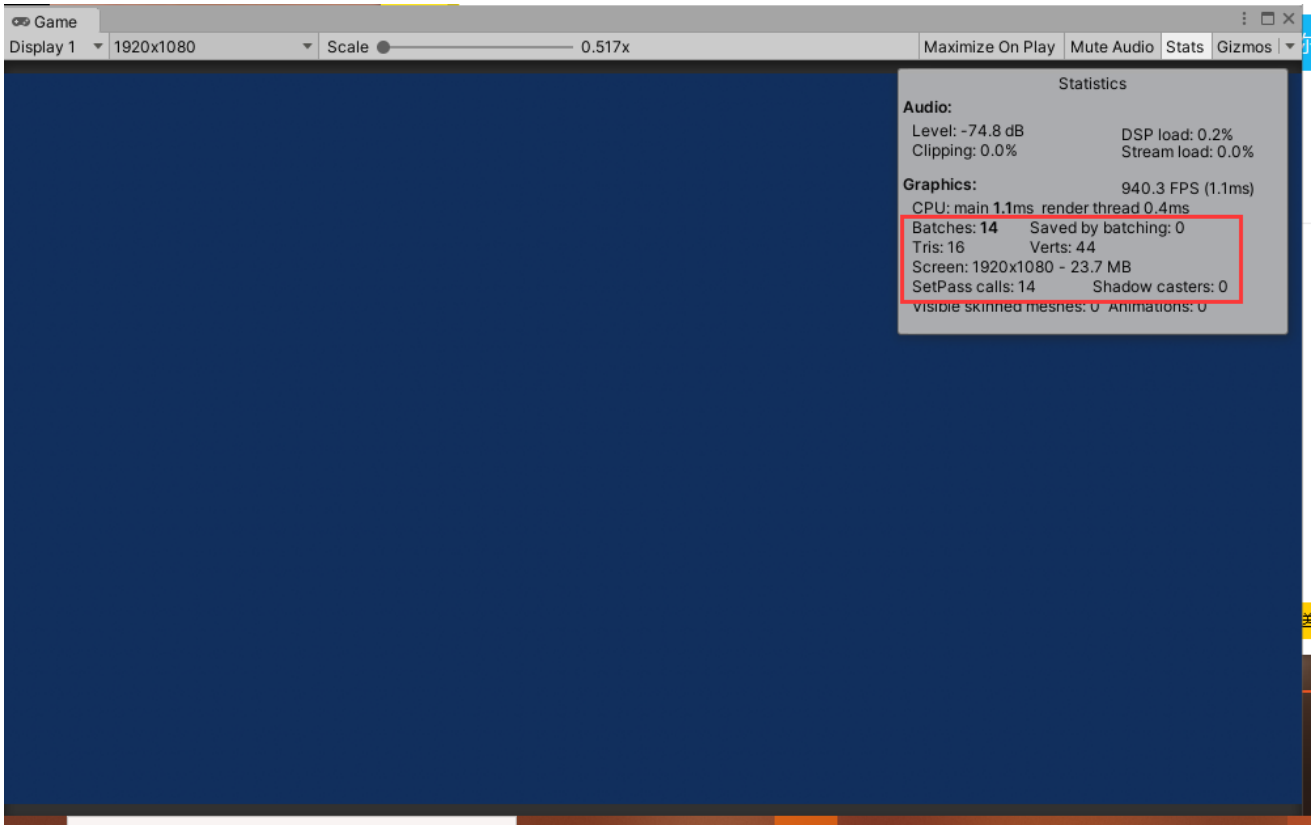
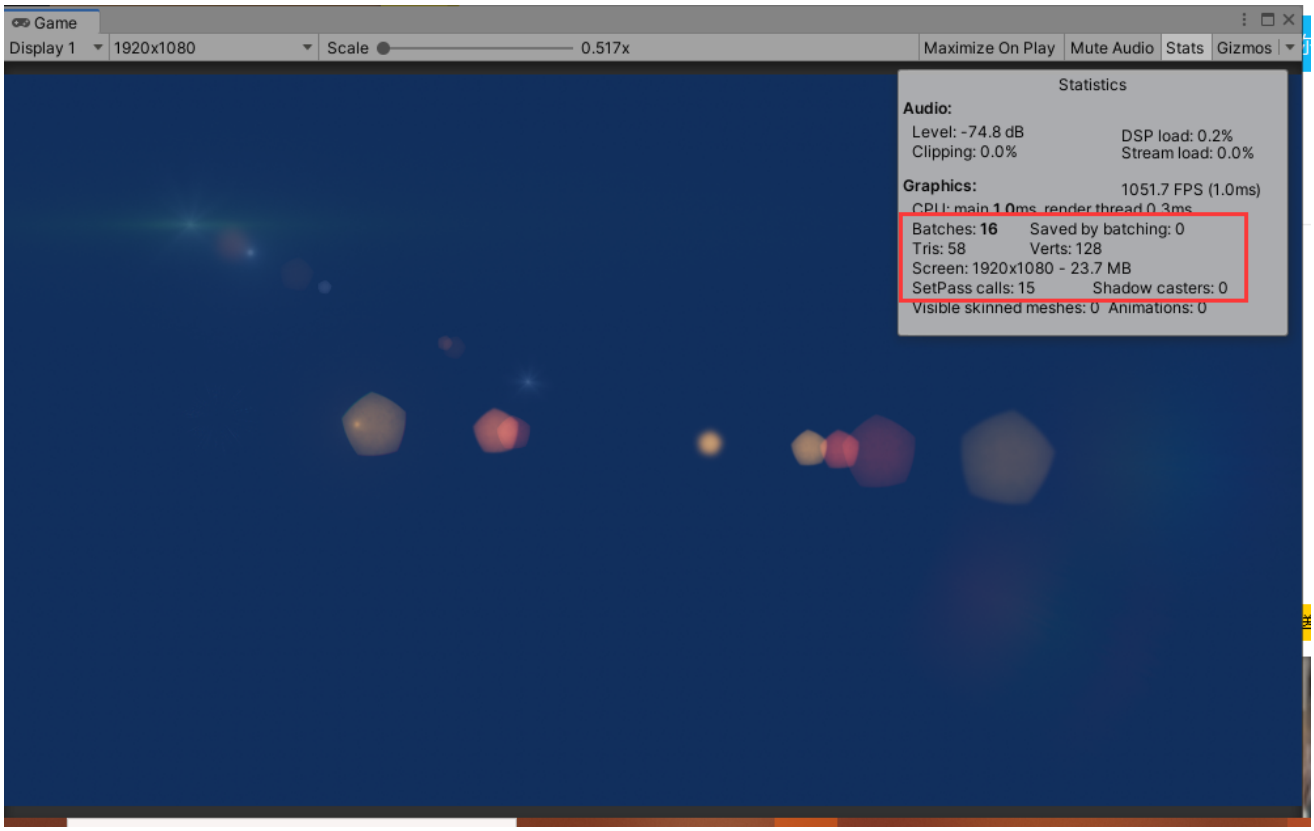
MoonFlow™ Lens Flare System

This is a *Lens flare* render system by render quad meshes in front of your camera. So it can be used in any render pipeline.

These system support **multiple** lens flares at the same time, and **each flare line cost one draw call**.





0. SpriteEditor version special settings

Slice version

In this version of asset, the flare atlas is separated by Sprite Editor. You need to change the "Texture Type" setting to "Sprite(2D and UI)", then set "Sprite Mode" to "Multiple". If you have installed Sprite Editor on your project, then you can edit it after tap apply at the moment.

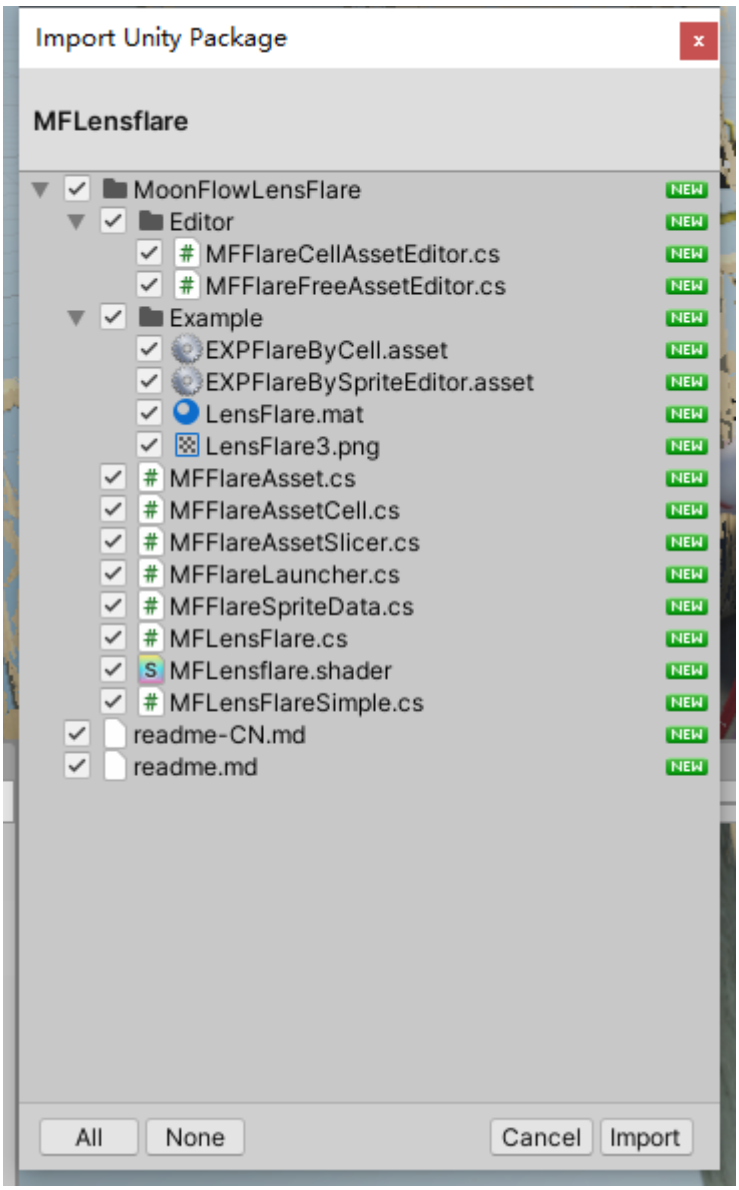
cell version

In this version, you don't need to slice by yourself, and atlas will be sliced automatically like cell mode of sprite slicer. So you need to set the amount for each axis on *"Cell"* property.

1. Setup

Download unitypackage to your computer.

Then you can see these Files :

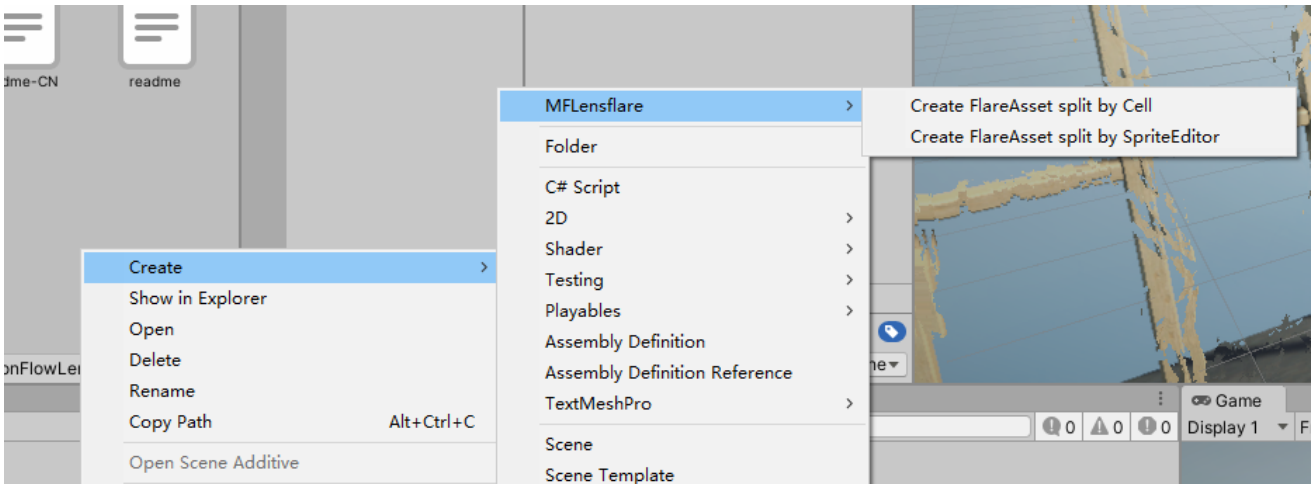


2. Init Asset

Move your cursor to *project view*, right-click and find the option:

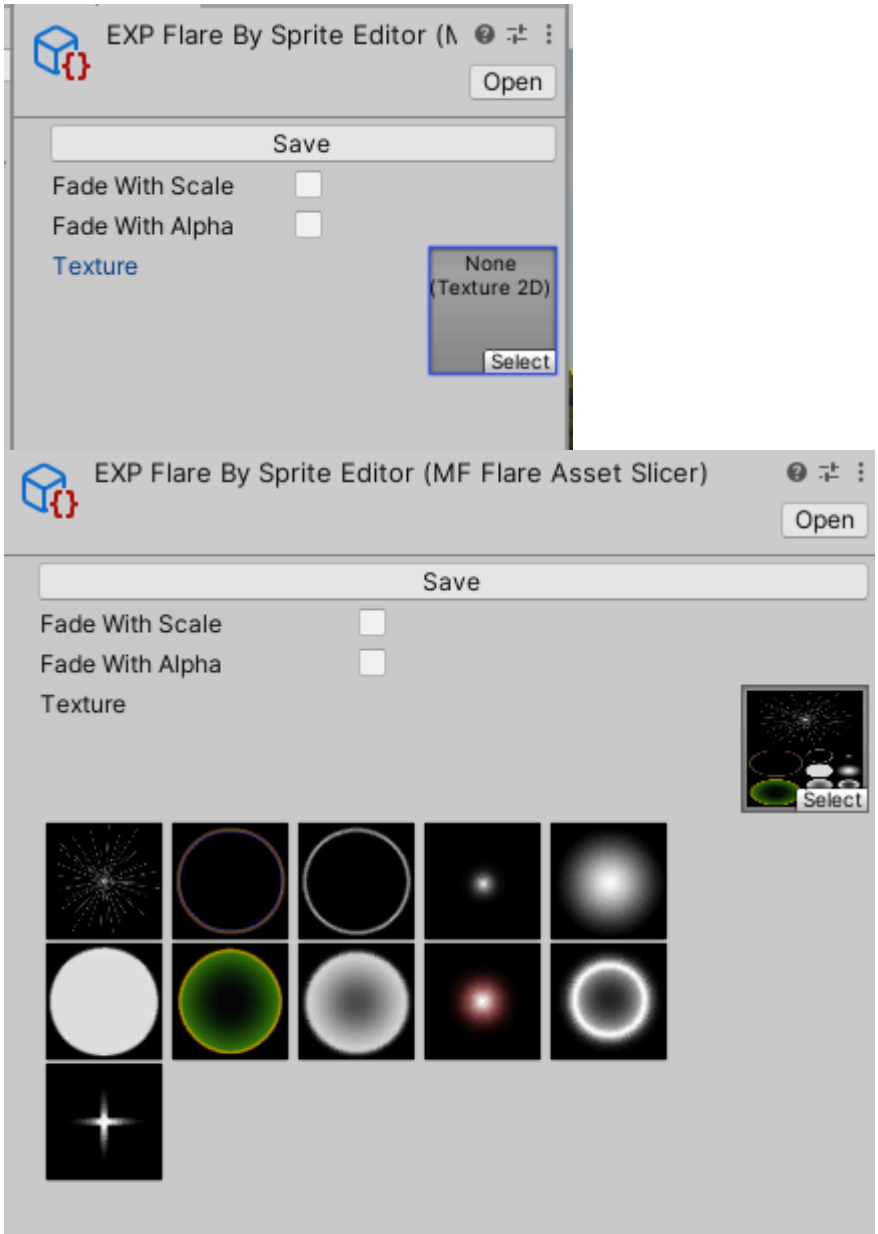
Create -> MFLensflare -> Create MFFlareData split by SpriteEditor.

Create -> MFLensflare -> Create MFFlareData split by Cell.

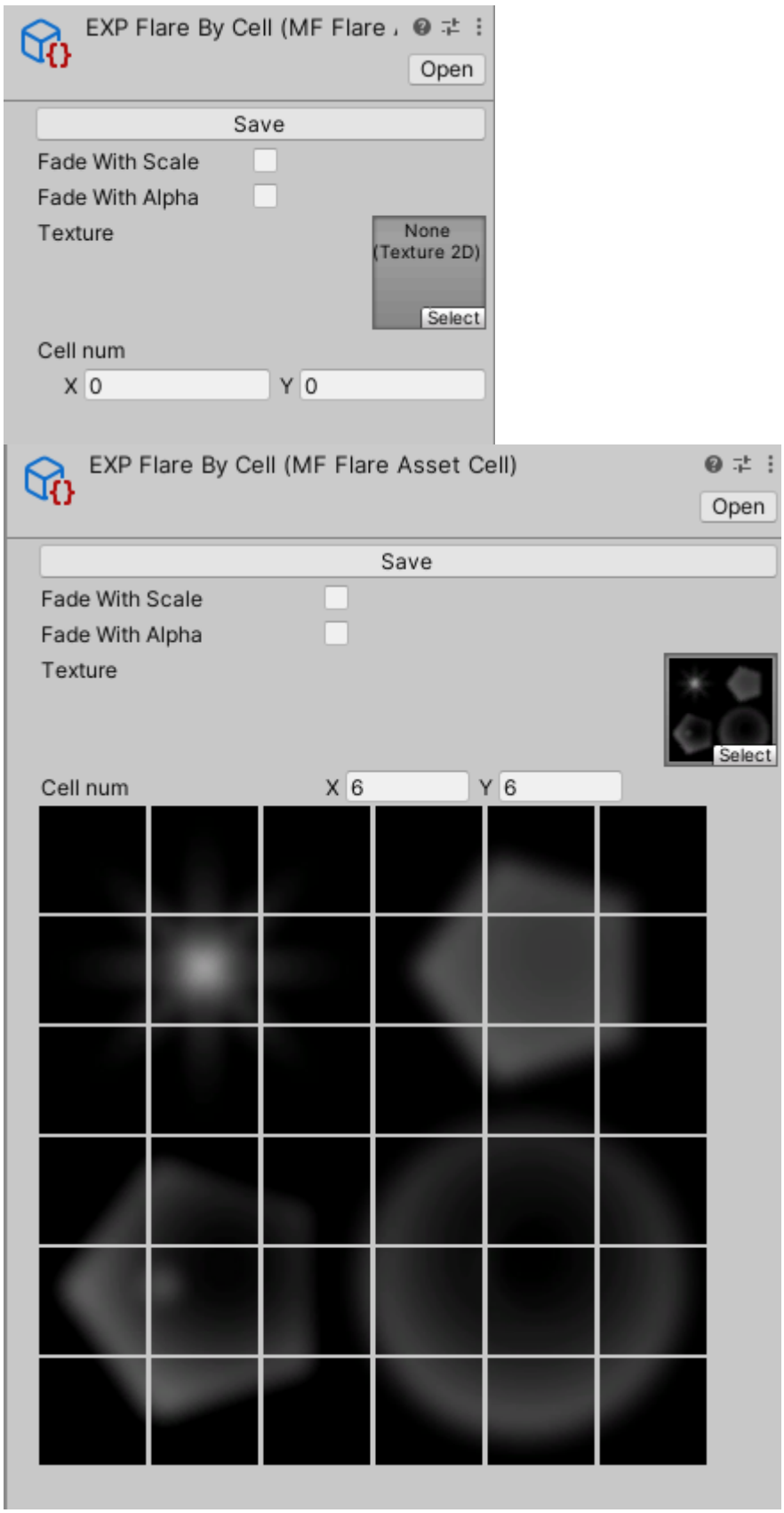


Then you can see the default settings in *Inspector view* when the asset was chosen.

SpriteEditor version



Cell version



3.Asset Settings

There are 3 global properties to set flare asset.

1) Texture

Choose the flare atlas you need.

2) Fade With Scale

Lens flare will change the sprite scale while they are fading in or fading out

3) Fade With Alpha

Lens flare will change the sprite Alpha while they are fading in or fading out

Special Settings for each asset version:

1. Slicer version

   On the *Texture Importer* settings of sprite atlas，The *Texture Type* setting need to set as *Sprite(2D and UI)*，and *Sprite Mode* need to set as *Multiple*

2. Cell version

   There is one more property called Cell(Vector2)，x is the number of flares of single line on the atlas，y is the number of flares of single column on the atlas

4.Add new flare

Lens flares based on a series of lined up sprites. So that we need to set every sprite pieces in flare assets. Click the separated atlas piece to create new flare piece. You can see following settings added in *Inspector view*.

1) Index

This solution search piece by setting index.you will find the index of every blocks on the board if you haven't chosen a sprite atlas. You can change this option to switch the piece you will use.

2) Rotation

If chosen, this piece will rotate along with light source while it is moving in view.

3) LightColor

It means the strength of single flare color which is totally mixed with light color or not.

And if the flare launcher has checked *Use Light Intensity*, the final color will also mixed with light intensity.

4) Offset

It controls the position where this piece will finally shown on screen.

The value based on the distance between light source and the center of display screen.

value = -1, this piece will coincide with the light source.

value = 0, this piece will coincide with the center of display screen.

5) Color

You can overlying a color to change the result of this piece(coexistence with light source color)

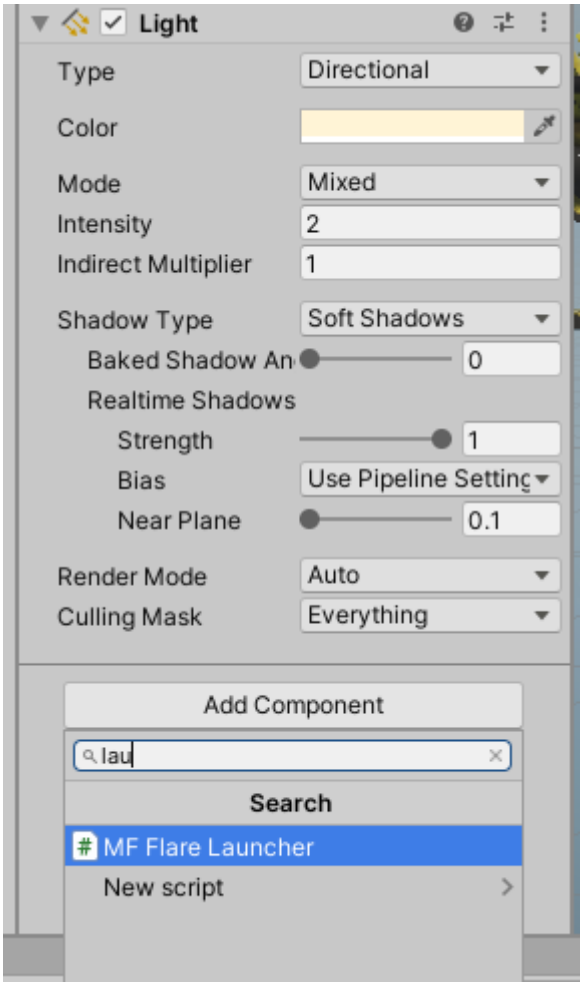
6) Scale

This piece shown on the screen based on this property.

7) Remove

Click to remove this piece from flare pieces list.

5.Add flare launcher to light source



Add *MFFlareLauncher* component to your game object. There are some settings based on light source, so that it requires Light component.

Now you can see launcher settings.

1) Directional Light

If the light source is directional light, set it true, otherwise set it false. This option will determine whether the flare will disappear or not if you are far away from the light source.

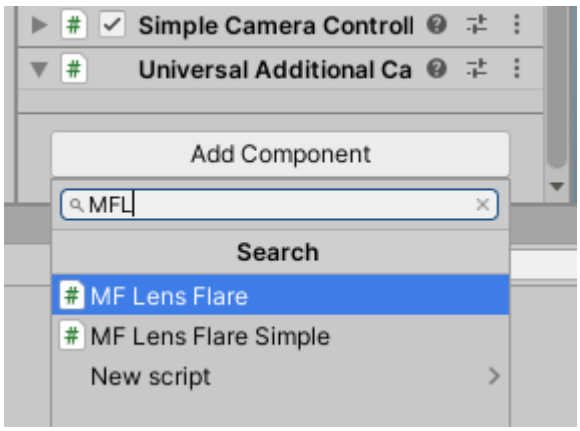
2) Use Light Intensity

the intensity of light will influence the intensity of flare on this light source if you set it true.

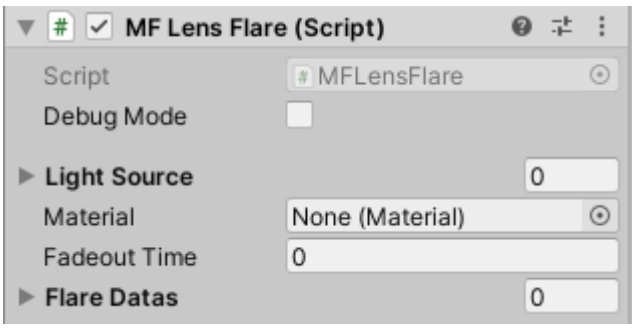
3) Asset

Set the flare asset you want to use for this light source, it can't be null

6. Add flare render to your camera



Add *MFLensFlare* component to your camera, now you can see flare render settings.



1) Debug Mode

There will render some line between real flare position and camera in scene view.

2) Material

Set a material to render your flare.**Caution: Be sure that this shader could be rendered correctly on your current render pipeline.**

The shader which used to render lens flare need to have following function, and I have already made an example called *MFLensflare.shader* in the project for you:

1. Depth map reading and occlusion determination

This solution could do occlusion determination by comparing the depth of light source with the depth of same pixel on depth map. So you need to input screen space light source position into the shader from C# script, using this screen position as uv to read your depth texture and find if light source has been obscured or not.

2. Vertex color mixing

This solusion deliver color settings of each flare asset to render by changing the vertex color of each mesh. It's quite similar as what Particle System do. So the shader need to mixing vertex color on the final step before output fragment result.

3. Queue > 3000 && Blend One One

It's easy to understand. Lens flare will not replaced color. And it also need to render some transparency pixel.

4. _MainTex

For the code in *MFLensflare.cs*, the chosen flare atlas is set by using *MaterialPropertyBlock*, and I have set the property name to "_MainTex", then the system could change atlases between different light source. You can change this property name, but be sure they are same in MFLensflare.cs and your shader at same time.

3) Fade out time

It shows how much time will cost to disappear the flares after light source disappeared from screen.

Some other optimized entries or questions

1. Incorrect(delayed) displacement sync when using cinemachine for rendered camera

   Please set execution order manually, be sure MFLensflare executed after cinemachine brain in the same tick. Look for more help:Execution order problem with assets (rainyrizzle.github.io)

2. Multiple light source with too much drawcall

   This solution allowed to use different atlas between different light sources, so each light source need one draw call to draw flare mesh. But they might be rendered just once (use just one draw call) theoretically when all the flares are from the same atlas.

3.