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Description: Create a heightfield based on given input image.

Platform: Windows 11, Visual Studio 2022.

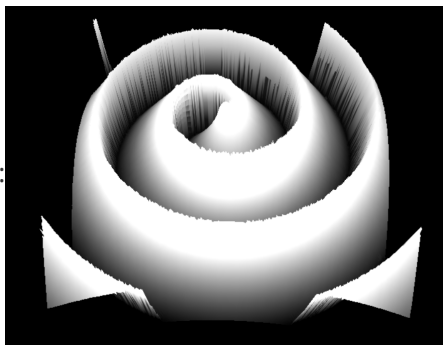
c++ version: ISO C++17 Standard.

To run the program, specify the path of image directory. For instance: hw1.exe C:\heightmap. If no path is specified, the program will keep asking for a valid one.

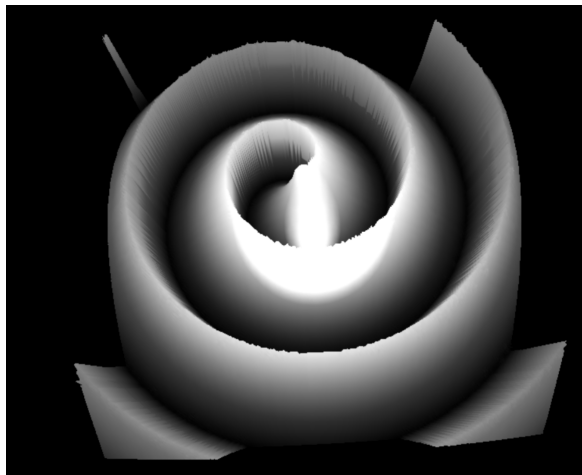
#### Features:

1. Render with lighting.
2. Draw with element arrays.
3. Support colors.
4. Support wireframe on triangles.
5. Switch images in runtime.
6. Use another approach for better smoothened color:

Before:



After:



This is done by passing the height scalar value into fragment shader and computing the final color.

7. A rough framework "Utility.h". Details in "Utility.cpp".

Main classes:

```
class EntityManager;  
class Entity;
```

```
class Component;  
class Transform;  
class Renderer;  
class Camera;  
class VertexArrayObject;
```

#### Controls:

1. Press '1' to render with Points.
2. Press '2' to render with Lines.
3. Press '3' to render with Triangles.
4. Press '4' to render with Triangles and smoothened height.
5. Press 'o' to switch to previous image.
6. Press 'p' to switch to next image.
7. Press 'l' to toggle wireframe display when render mode is Triangles.
8. Press 'v' to render with default lighting.
9. Press 'b' to render with ambient only.
10. Press 'n' to render with diffuse only.
11. Press 'm' to render with specular only.
12. Rotate with mouse drag.
13. Move with Ctrl + mouse drag.
14. Scale with Shift + mouse drag.
15. Press 'x' to toggle screenshots recording (15 screenshots per second under 120 fps).