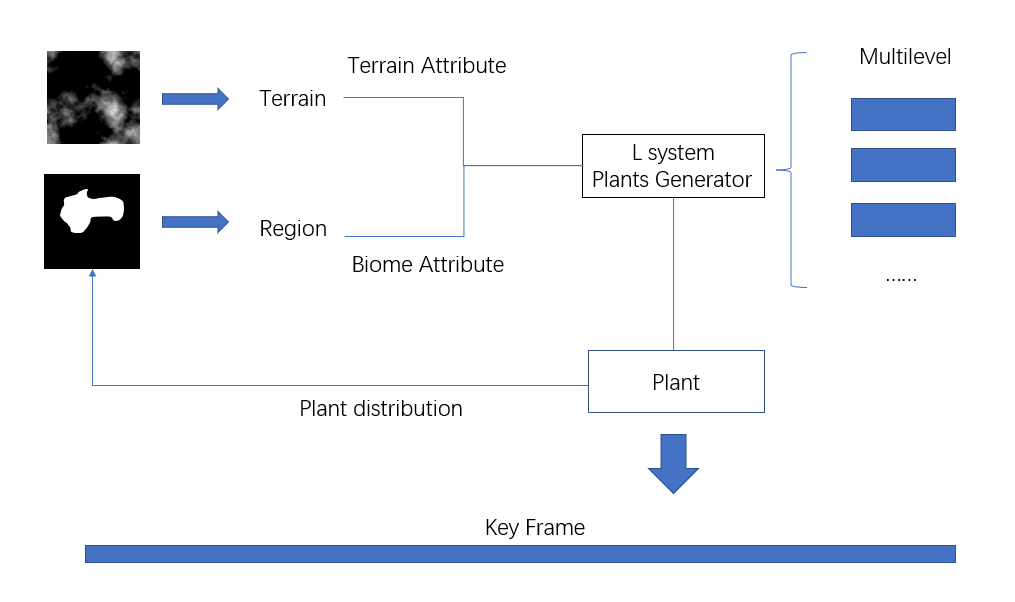
**Project report**

**Summary**

****This report will give a detailed introduction to the algorithm design and code structure of the Maya program ---- Landscape System, as well as the application instructions and operation results.

**Introduction**

Landscape System is a system that allows users to simulate the growth and distribution of plants created by L-system on the selected region of the terrain they set up. The functions of Landscape System include terrain editing, plants creation, area selection and plants filling.

**Algorithm design**

Algorithm design can be divided into four connected parts ---- Terrain generation, Region selection, Plant generation, Plant distribution, which are similar to the functional structure of Landscape System.

In the part of terrain generation, we adopt two methods: noise map and height map. The algorithm of terrain generation from noise graph is based on a random noise generating function, and the values generated by the function are assigned to the vertices of the terrain grid. The algorithm of generating terrain from height map is to gray-scale the imported height map and assign the color value of each pixel point to the grid vertices of terrain.

Region selection is based on the imported bitmap with the same size as the terrain to generate a list of the corresponding pixel length, which uses 0 and 1 to record whether each vertex of the terrain is chosen to plant trees or not.

The generation of plants We use the L-system to generate 3d plant branch models with given rules and the number of iterations. We used three rules to generate three different plant branches, and at the same time drawn two 2d leaves distributed on the branches.

Finally, the distribution of plants on the terrain is randomly distributed in the selected area. At the same time, the orientation of plants will be adjusted randomly, and the number of plants can be set by the user.

**Script structures**

**User manual**

**Results analysis**

**Shortcomings and Future work**

Although the current project has implemented many functions, there are some flaws and some unimplemented functions that we expect, which will become our future work.

Flaws:

1.The water surface will directly submerge the plants

2.The types of L-system are not rich enough

3.The function of the noise map to generate terrain can be optimized

Unimplemented functions:

1.Plant distribution according to environmental factors

2.Animation of plant growth