The Model of Four Color Theorem

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Abstract
There is no perfect solution to the four-color theorem, although mathematicians have demonstrated it with computers. People have been asking: What is the essence of the four-color theorem? We think that the four color theorem is a space partition problem. We started from one-dimensional space, then expanded from one-dimensional space to two-dimensional space, and the problem was solved perfectly.

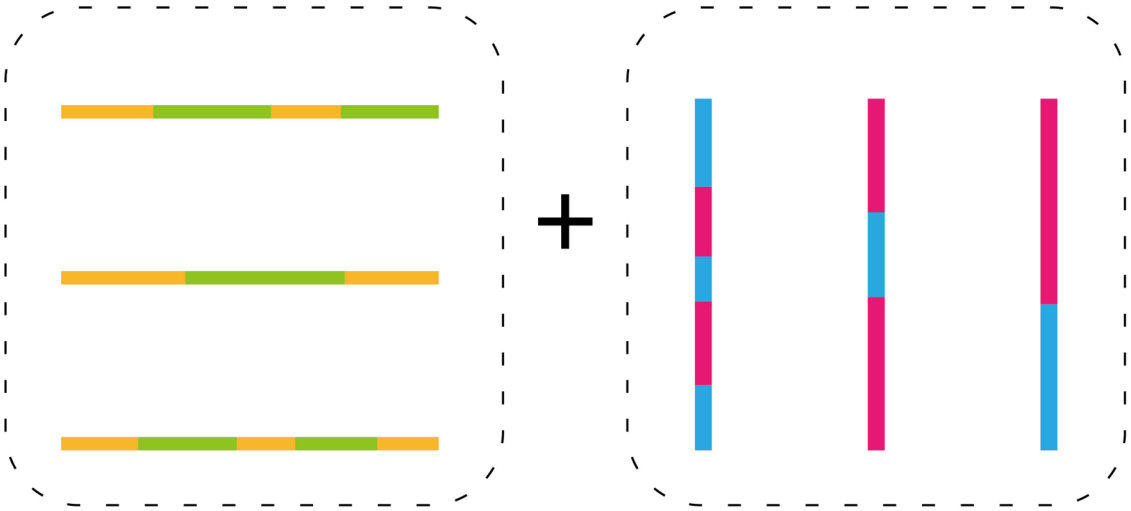
Keyword
Four color theorem, space, dimension

Introduction
The minimum number of colors and dimensions are the key to the problem.
1. Divide one-dimensional space
One dimensional space has only one dimension, Divide the one-dimensional space, and any two adjacent parts have different colors, so at least two colors are required. Therefore, the minimum number of colors in one dimension=2. Figure 1

Fig. 1 Division in one-dimensional space, minimum number of colors=2

2. Split 2D space
Divide the two-dimensional space, and any two adjacent parts have different colors. The two-dimensional space has two dimensions, which obviously need at least: （The minimum number of colors in one dimension）*2, that is, 2*2=4 colors. Figure 2

Fig. 2 Division of two-dimensional space,
(minimum number of colors in one dimension) * 2



3. Special examples
In general, the minimum number of colors in two-dimensional space is 4. However, in some special cases, the minimum number of colors can be smaller, such as 2. Figure 3

Fig. 3 One of the special cases, the minimum number of colors=2

Conclusion
1. The four-color theorem is right.
2. The minimum number of colors: 1D:2*1, 2D: 2*2, 3D: 2*3.

Reference
Graph Theory, 5th Edition. By Reinhard Diestel 2018.