

## **A logical proof of the Four Color Problem**

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The Four Color Conjecture is a well-known coloring problem of graphs. Since its advent, there are a lot of solvers. One of the early pioneers was Percy John Heawood, who has proved the Five Color Theorem. In addition, Kempe first demonstrated an important conclusion about planar graph: in any map, there must be a country with five or fewer neighbors. Kempe's proof proposed two important concepts -- "configuration" and "reducibility", which laid the foundation for further solving the Four Color Problem. The Four Color Problem had previously been proved by use of computer. Based on Kempe's concepts of "configuration" and "reducibility", this paper attempts to provide a non-computer proof of the Four Color Problem through rigorous logical analysis.

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