Math 45 Spreadsheet Project

(From *A Problem Solving Approach to Mathematics for Elementary School Teachers*, 6th Edition by Billstein, Libeskind & Lott, Addison-Wesley Pub., 1997, pg. 145.)

The following figure contains a map of the western portion of the continental United States. Each state contains a number to indicate the approximate number of thousands of square miles in the state. For example, Montana contains approximately 147,000 mi^2. You are asked to color the map and are given four colors, numbered 1, 2, 3, and 4. The cost for coloring the map is \$1, \$2, \$3, and \$4 respectively, for each color per 1000 mi^2. For example, if Montana were colored with the number 2, the cost would $2 \cdot 47$, or \$294; if it were colored with the 1, the cost would be \$147. The goal is to color the map as cheaply as possible. There are only two rules to consider in coloring the map:

1. If two states have a common border, for example, Texas and Louisiana, they cannot be the same color.

2. When coloring Utah, Colorado, Arizona, and New Mexico, states that all touch each other at one point, you may color Colorado and Arizona, for, example, the same color, but Utah and New Mexico must be colored differently. That is to say, at least three colors must be used in these four states.

Use a spreadsheet with headings similar to those in the table below to record decisions and to update the computations as your try the problem.

State	No. of Square Miles	Color Value	Cost = Product of number of Square Miles x Color Value
Arizona	114		
Arkansas	53		
California	159		
. . .	. . .		
Wyoming	98