- Similar statement, different difficulty

- Graph coloring: assign colors to vertices, so that connected vertices are of different color
  
  minimize number of colors used.

- 2-COLORING
  
  - Can solve by BFS (color odd layers blue, even layers yellow)

- 3-COLORING

- Simple reduction examples
  
  - L1S: 5, 4, 6, 1, 2, 3, 9, 8, 10
  
  1, 2, 3, 8, 10
- LCS  2, 1, 3, 4, 6, 5
   2, 3, 1, 6, 5, 4
   2, 3, 6, 5

- Given: solution to LCS
  \[ \text{LCS}(a[], b[]) \]

\[ \text{LIS}(a[]) \]

bij = sort(a[])

return LCS(a[], b[])

\[ a[]: 5, 4, 6, 2, 3, 9, 8, 10 \]

sort b[]: 1, 2, 3, 4, 5, 6, 8, 9, 10

- Example of NP-Problem

- 3-COLORING

- Is there a way to color G using 3 colors?

- Prover: answer Yes/No. If Yes, also give a coloring.