

COMPUTER SCIENCE 20, SPRING 2012  
DISCRETE MATHEMATICS FOR COMPUTER SCIENCE

Class #12 (Induction)

**Homework, due in hard copy Friday 2/24/2012 at 10:10am**

**Please write your TF's name on your homework, and list the names of any students with whom you collaborated.**

1. Suppose that the plane ([http://en.wikipedia.org/wiki/Plane\\_\(geometry\)](http://en.wikipedia.org/wiki/Plane_(geometry))) is cut into regions by drawing (infinitely long) straight lines, and these regions are colored black or white. Using induction, prove that it is always possible to choose colors for the regions so that adjacent regions are never the same color. Here “adjacent” does not include the case where two regions that touch only at a corner. (*Hint: Induct on the number of lines drawn. What happens when you add another line? Draw a picture!*)