

Outline for Lecture 12

Joe Kilian

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1. Hardness of Independent Set/Clique
 - Setting up the array
 - asymptotic free bits
 - The final relationship
2. Harness of Coloring
 - Relationship between Coloring/Independent Set
 - Fractional Chromatic Number
 - A parallel theorem
 - 3-coloring example
3. Upper Bounds
 - (a) Vertex Cover
 - Greedy Heuristic
 - Good to within a factor of 2
 - $7/6 + \epsilon$ is hard
 - (b) 3SAT
 - How to satisfy $7/8$ of equations
 - Hastad - best possible
 - What about 2SAT?
 - (c) Set Cover
 - Greedy Heuristic
 - Proof of $\log n$ optimality
 - Lower bound on greedy heuristic
 - $\log n$ about best one can do
 - (d) 3-colorability
 - Wigderson Trick
 - one can do better
 - Maybe one can 6 color a 3-colorable graph