Computational Complexity

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1 Reductions and Completeness

- 1. Comparing problem difficulties.
- 2. Definition of reductions.
- 3. Completeness.

2 The class NP

- 1. Needles and Haystacks.
- 2. Hamilton path.
- 3. First definition.
- 4. Asymmetricity of **NP**.
- 5. \mathbf{P} and \mathbf{NP} .

3 Sample problems in NP

- 1. kSAT.
- 2. 1SAT, 2SAT, HornSAT are in ${\bf P}.$
- 3. Hamilton Path to SAT.
- 4. Boolean circuits.
- 5. The Circuit Value and Circuit SAT problems.
- 6. Reducing Circuit SAT to SAT.
- 7. Graph Coloring.
- 8. Integer partitioning, Subset Sum.