

NP-completeness

Abhiram Ranade

April 5, 2016

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NP does contain "easy" problems also, e.g. class P.

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- ▶ If you want to say, "probably there is no polytime algorithm for problem Q ", show that Q is NP-hard.
- ▶ Strategy for proving that a problem R is NP-Hard:
Prove that some NPC problem reduces to R .

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Alternatively: Show it is in NP, and reducible from an NPC problem.

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Show that it is NP-hard, and in NP.
Alternatively: Show it is in NP, and reducible from an NPC problem.
- ▶ If you prove a problem NP-hard, you have shown that it is as hard to design polytime algorithms for the problem as any problem in NP, and no harder.