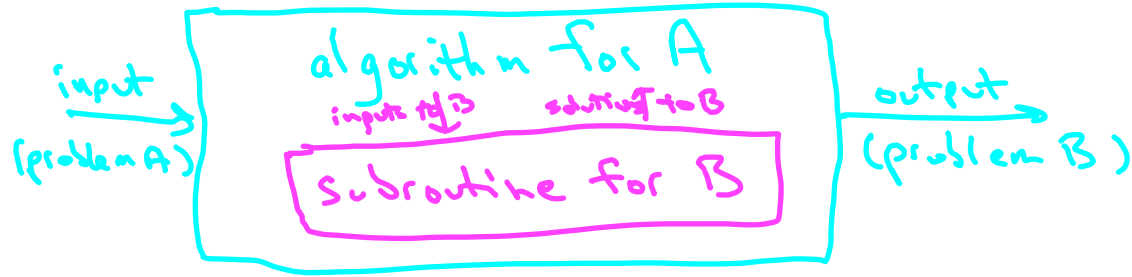


Section 21.3: Problem-Specific Algorithms vs. Magic Boxes

Reductions to Magic Boxes



Key point: reduction from A to B transfers tractability (from B to A), requires only a "magic box" for solving B.

MIP and SAT Solvers

Solver: usually a sophisticated algorithm, carefully tuned + expertly implemented, available "off-the-shelf."

MIP: mixed integer programming.

SAT: satisfiability.

Goals

Non-goal: learn how MIP / SAT solvers work.

(Complicated - Search for "branch + bound", and "conflict-driven clause learning")

Goal #1: Awareness of semi-reliable magic boxes for MIP & SAT.

Goal #2: Examples of NP-hard problems that can be encoded as MIP or SAT.

Goal #3: Know where to go next to learn more.