

For Wednesday

- No reading
- Homework:
 - Chapter 9, exercises 11, 15, 16

Exam 2

- Friday
- Covers material through minimum spanning trees
- Take home handed out at the exam due the following Wednesday

Research Paper

- Any questions?

Program 4

- Any questions?

Review questions?

Another Class of Intractable Problems

- Polynomial problems are considered tractable.
- What does NP mean?

Non-deterministic Polynomial

- A deterministic machine must always make a single choice.
- Suppose you had a non-deterministic computer.
- Then you could “pick” all of the different choices at once (or automatically pick the best solution).

The Class NP

- Can determine that a solution is the correct solution in polynomial time.
- All problems with polynomial time solutions fit into this class.
- Some decidable problems do not. Consider problems for which the solution is of exponential length.

The Big Question

- Are there problem in NP that are not in P?
- Brings us to the class of NP-complete and NP-hard problems.
- NP-complete problems are reducible to one another.

Examples

- Traveling Salesman
- Hamiltonian Cycle
- Satisfiability (technically, 3Sat)
- Graph coloring
- Knapsack
- Bin packing