Always provide explanations and show as much work as possible.

Solutions to odd-numbered exercises are available at `https://www.algorist.com/algowiki/index.php/Solution_Wiki,_The_Algorithm_Design_Manual,_3rd_Edition`.

- If you are stuck on an even problem, try to find a similar odd-numbered exercise.

- If an odd-numbered problem is assigned, you are expected to (1) first attempt the solution on your own, (2) write and explain your solution in your own words.

- The solutions are written by the community, meaning that some problems may not have solutions and some solutions may be incorrect! I found at least one incorrect solution the last time I taught the course.

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1. Exercise 1-2 from Skiena.

2. 1-5.

3. Your classmate claims that all jelly beans are the same color. They give the following proof:

   Proof. (By induction.) Base case: when we have a single jelly bean it can only be one color.

   Inductive hypothesis: Assume that all sets of n jelly beans are the same color. Consider a set of $n+1$ jelly beans. Choose a subset A of size n from this set; these beans must be the same color by our inductive hypothesis.

   Now consider the bean you did not pick. Swap this bean with any bean from the set A. This forms a set B of n beans, and so must be the same color by our inductive hypothesis.

   Sets A and B share $n-1$ beans, hence each set must be the same color. In other words, all $n+1$ beans are the same color. □

   What is wrong with this proof?

4. 1-8

5. 1-9

6. 1-14

7. 1-22. Interviewers love to ask estimation questions like this. The important part here is your *process*, not the actual answer you get. Make some simplistic assumptions and ballpark it.

8. 2-2

9. 2-7

10. 2-10

11. 2-17

12. 2-26

13. 2-30

14. 2-41