ProgTeam Spring Week 1

Interactive Problems

Classic/Google Interview Question:

- You have an egg drop contraption and are at Google's HQ, an 100 story building.
- Assuming your device takes no damage (only the eggs do), can you figure out what the maximum floor you can drop the device from that won't damage the egg?
- What's the minimum amount of tests you need to do?

Classic/Google Interview Question:

- Fairly straight forward binary search:
  - (You need 6 queries)

- How are these types of questions turned into competitive programming questions?

Interactive Problems

- You output a “query”, and get some type of response back
- Important! Flush the output stream after making each query

```
                                    ? Floor 50
safe
                                    ? Floor 75
broken
                                    ? Floor 63
safe
                                    ...
                                    ! Floor 72!
```

Two Types of Problems

- “Guessing” problems: using queries to gain information
  - Most common interactive problem
  - See: the egg drop problem
    - (Binary search is not uncommon here)
  - Almost always a maximum number of queries
- “Game” problems: win a game against some adversary
  - The judge will run its own AI to make a move against you
  - Usually DP-problems or “Nim” problems (or both)