

Elevators

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Assume all buildings are 100 stories high, and if you opt for a button that takes you to the 101st floor or higher, or to floors numbered zero or below, the elevator will go nowhere. Also, the designers programmed the buttons to de-activate after a single use, and then re-activate after a different button has been used. This thwarts those impatient people who can't seem to push the same button enough times.

Example problem: Given the set of four buttons at the right, can you get from the 40th floor to the 30th in fewer than six moves. **Solution:** from 40 visit 37, 48, 45, and then down 15 to floor 30.

UP 7	UP 11
DOWN 3	DOWN 15

Stuck in a Square Elevator

Problem 1: Using the set of buttons below, can you get from the 100th to the 92nd floor in fewer than 8 moves? Recall that you cannot use the same button twice in succession.

Remember: the same button cannot be used twice in succession.

Problem 2: Using the same four buttons, can you get from the 24th to the 1st floor in fewer than 10 moves?

Problem 3: Using those same buttons, can you get from the 1st floor to the 2nd floor in fewer than 10 moves?

UP 4	UP 25
DOWN 9	DOWN 16

Stuck in Fibonacci's Elevator

Problem 4: Using the set of buttons below, can you get from the 2nd to the 1st floor in fewer than 12 moves?

UP 8	UP 13
DOWN 5	DOWN 21

Problem 5: Using the same four buttons, can you get from the 50th to the 30th floor in fewer than 12 moves?

Problem 6: Using those same buttons, can you get from the 1st floor to the 100th in fewer than 20 moves?

Finally, can you solve any of these in fewer moves than we show you in the solutions?

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