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.

UP 7	UP 11
DOWN 3	DOWN 15

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.

Stuck in a Five-Star Elevator

Problem 1: Using the set of buttons below, can you get from the 100th to the 98th floor in fewer than 8 moves? Recall that you cannot use the same button twice in succession.

UP 12	UP 22
DOWN 5	DOWN 35

Problem 2: Using the same four buttons, can you get from the 25th to the 27th floor in fewer than 5 moves?

Problem 3: Using those same buttons, can you get from the 5th to the 1st floor in fewer than 9 moves?

Stuck in a Power Elevator

Problem 4: Using the set of buttons below, can you get from the 5th to the 8th floor in fewer than 10 moves?

Problem 5: Using the same four buttons, can you get from the 1st to the 100th floor in fewer than 10 moves?

UP 4	UP 27
DOWN 8	DOWN 9

Problem 6: Using those same buttons, can you get from the 2nd to the 1st floor in fewer than 12 moves?

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