

# Elevators

# 3

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.

<b>UP</b> <b>7</b>	<b>UP</b> <b>11</b>
<b>DOWN</b> <b>3</b>	<b>DOWN</b> <b>15</b>

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## Stuck in a Prime Elevator

Problem 1: Using the set of buttons below, can you get from the 50th to the 51st floor in fewer than 10 moves?

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

Problem 2; Using the same four buttons, can you get from the 5th to the 1st floor in fewer than 10 moves?

Problem 3; Using those same buttons, can you get from the 100th floor to the 96th floor in fewer than 9 moves?

<b>UP</b> <b>5</b>	<b>UP</b> <b>11</b>
<b>DOWN</b> <b>2</b>	<b>DOWN</b> <b>17</b>

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## Stuck in Fibonacci's Elevator Again!

Problem 4: Using the set of buttons below, can you get from the 80th to the 100th floor in fewer than 10 moves?

<b>UP</b> <b>5</b>	<b>UP</b> <b>21</b>
<b>DOWN</b> <b>8</b>	<b>DOWN</b> <b>13</b>

Problem 5: Using the same four buttons, can you get from the 100th to the 99th floor in fewer than 10 moves?

Problem 6: Using those same buttons, can you get from the 11th to the 1st floor in fewer than 16 moves?

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

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