Extra Lab Test
CSE 4108

Safely Cracked

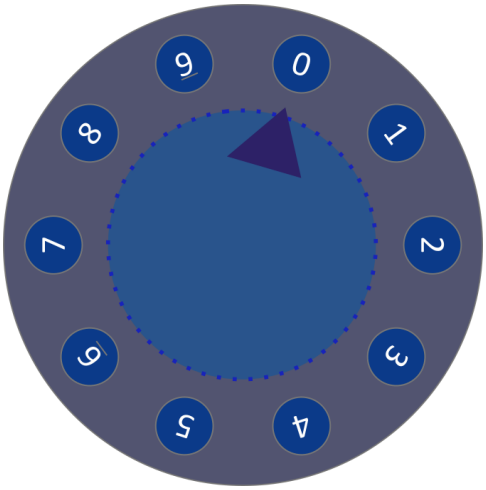
Scenario

Mr. XY just bought a brand new combination locked safe with a rotating knob. The knob needs to be rotated in a specific way to open the safe. To be very specific, the knob needs to be rotated certain ticks to the left, then certain ticks to the right, then left again and then right to open the safe (Sequence: LEFT, RIGHT, LEFT, RIGHT). Mr. XY being a Cyber Security enthusiast, often changes the amount of rotation required in each direction. The safe knob has 10 ticks marked from 0 to 9 clockwise and the mechanism of the shape with a reference picture is given in the next section.

As a veteran Safe Cracker and a Computer Science student, your duty is to write a C program that would take a rotation sequence of four values in the directions LEFT, RIGHT, LEFT, RIGHT as input (of course it is the code to open the safe) and print out where the knob will land after each rotation. The knob will always start from 0.

Safe's Mechanism

- Rotating the knob 4 times to the right while it is in 0 will bring the knob to 4. Similarly, if the knob is initially at 1, rotating it 3 times to the left will bring it to 8.
- So a rotation sequence of 3, 4, 5, 6 in the directions LEFT, RIGHT, LEFT, RIGHT will bring the knob to 7, 1, 6, 2 respectively. LEFT is counter-clockwise and RIGHT is clockwise.
- The safe has a safety mechanism and it cannot be rotated more than 9 ticks at one go in one direction.



Input

Four digits **without** any space in between representing the amount of ticks rotated in the direction LEFT, RIGHT, LEFT, RIGHT respectively. A single digit is always between 0 to 9.

Output

Four digits separated **without** any space on which the knob lands after each rotation.

Samples

Input	Output	Explanation
3456	7162	Explanation is given in the Safe's Mechanism section.
0909	0998	The knob is only rotated in the right direction (clockwise) in 2nd and 4th turn, so after 2nd, the knob goes to 9, remains there in the 3rd turn and rotates the whole circle to 8 after the 4th turn.
9999	1010	Rotating 9 ticks left brings the knob to 1 by traveling backward. Next 9 ticks right turn cancels the previous one out. Then these 2 steps are repeated again.
4321	6978	Follow previous explanations.

Hint

Since all the input rotations are single digit, can the input somehow be made simplified without extracting digits from a single integer?