

## 1-8 Puzzle

The 1-8 puzzle has been a famous problem for many intro reinforcement learning class. However, we would like to solve it today and find the least number of moves. To debrief on what is the 1-8 puzzle, the objective is to make the board into the 1-8 configuration.

At each position, a move is defined as picking a cell on the board next to the empty cell and moving it to the empty cell.

### Input

The input consists of three lines, each representing a row of cells with three number from 0 to 8, where 0 denotes the empty cell. The input denotes the state of the 1-8 puzzle, which is guarantee to be a valid state that is either reachable or unreachable.

### Output

The output is one integer that denotes the least number of moves needed to solve the 8-puzzle. If the puzzle is not solvable, return  $-1$ .

#### Sample Input

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```
1 2 3
4 5 6
7 8 0
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1 2 3
4 5 6
7 0 8
```

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#### Sample Output

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```
0
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1
```

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