



COMPETITIE

# PROG-A-THON

## 3: Rook Movement

**Level:** easy

**Time limit:** 2.000 seconds

A rook can move either horizontally or vertically on a chess board. On an  $8 \times 8$  chess board, we want to find a way to move the rook from **a1** to **h8** with exactly  $n$  moves. During these moves, the rook visits every cell on which it ends a move (including the starting cell **a1**). Because we want an original route, we require that the rook never visits the same cell twice.

### Input

The input consists of a single number  $n$  ( $2 \leq n \leq 63$ ) indicating the number of moves the rook should make.

### Output

Output a list, separated by spaces, of the  $n + 1$  visited cells in the order in which they are visited by the rook. A cell can never appear twice in this list (as that would mean that the cell is visited twice). The list of visited cells should always begin with **a1** and end with **h8**.

There is always a solution possible to move the rook from **a1** to **h8** in the desired number of moves. You may output any list of cells that satisfies the above constraints (there may be multiple possibilities).

#### Sample input 1

2

#### Sample input 2

4

#### Sample output 1

a1 a8 h8

#### Sample output 2

a1 e1 b1 b8 h8