The miles of fertile ground that lie amongst that small knot of villages known as *The Endians* have been ploughed for generations. As each farmer has taught their own ploughing method to their descendants, so each descendant has increased the complexity of that method. On occasion because they have gained land; on occasion to show their skill; on occasion by misunderstanding the instructions.

2	3
1	4

1st Generation

The ploughing method is based on rotating U-shapes that cover 2×2 squares of land. In each generation the total area ploughed started at (0,0) in the bottom-left and finished in the bottom-right, the plough only moving horizontally or vertically, never reploughing any land.

6	7	10	11
5	8	9	12
4	3	14	13
1	2	15	16

2nd Generation

- In the 1st generation only a single 2×2 area was ploughed, as shown by the order given in the diagram. This was passed down by the 1st generation with the instructions *"Plough going north, east and south"*, those being the directions by which the plough moved;
- In the 2nd generation, the farmer mistakenly followed the instructions by ploughing a 2×2 U-shape, then moving north, ploughing another 2×2 U-shape, then moving east, etc... as shown in the second diagram. They passed on instructions beginning *"Plough going east, north, west, north, ...";*
- Future generations followed this approach, by design or co-incidence, ploughing U-shapes in between their ancestor's directions;
- The start of the 3rd generation's ploughing is shown in the final diagram.

16	13	12	11	⋯
15	14	9	10	⋯
2	3	8	7	⋯
1	4	5	6	⋯

3rd Generation

Note that, the starting square in every 2×2 area together with the desired direction afterwards (or ending position for the last 2×2 area) only permits one rotation of the U-shape for that area.

From generation to generation, as the sun shines with meridian splendour, each farmer has asked the same question — *"where am I?"*.

For example:
- In the 1st generation the farmer was at (1,1) when ploughing the 3rd square;
- In the 2nd generation the farmer was at (2,3) when ploughing the 10th square;
- In the 3rd generation the farmer was at (3,2) when ploughing the 10th square.

Write a program whose input is a single line containing a pair of integers g $(1 \le g \le 31)$ then s $(1 \le s \le 2^{2g})$ indicating the generation being considered and the square of land respectively.

You should output a pair of integers, giving the co-ordinates of the sth square of land that is ploughed in the gth generation.