Task Sob

It was a dark and dreary Christmas Eve when our hero pondered, weak and weary, over a quaint and curious COCI task. When he nodded, nearly napping, suddenly he heard a tapping, tapping and a mighty roar. A giant reindeer broke through his chamber door, merely this and nothing more. While our hero's heart slightly fluttered, the beast simply uttered: *"I won't leave until you solve this problem"*.

In the problem you were given two integers N and M and you were supposed to perfectly match the numbers from sets $A = \{0, 1, 2, \ldots, N-1\}$ and $B = \{M, \ldots, M+N-1\}$ into N pairs, such that for the matched numbers $x \in A$ and $y \in B$ it holds $x \,\&\, y = x$, where $\&$ denotes a bitwise AND operation.

Input

The first line contains two integers N and M ($1 \leq N \leq M, N + M \leq 10^6$) from the task description.

Output

You should output N lines and in each line you should output two integers x and y, where x belongs to set A and y belongs to set B. Numbers in each line should correspond to one of the matched pairs from task description.

It is possible to prove that the solution always exists.

Scoring

Subtask	Score	Constraints
1	10	N is a power of 2
2	29	$N + M$ is a power of 2
3	39	$N + M \leq 1000$
4	32	No additional constraints.

Examples

input

```
1 3
```

output

```
0 3
```

input

```
3 5
```

output

```
0 5
1 7
2 6
```

input

```
5 10
```

output

```
0 12
1 13
2 10
3 11
4 14
```