Bitwise Operators

Objective
This challenge will let you learn about bitwise operators in C.

Inside the CPU, mathematical operations like addition, subtraction, multiplication and division are done in bit-level. To perform bit-level operations in C programming, bitwise operators are used which are explained below.

- `Bitwise AND operator &` The output of bitwise AND is *1* if the corresponding bits of two operands is *1*. If either bit of an operand is *0*, the result of corresponding bit is evaluated to *0*. It is denoted by &.
- `Bitwise OR operator |` The output of bitwise OR is *1* if at least one corresponding bit of two operands is *1*. It is denoted by |.
- `Bitwise XOR (exclusive OR) operator ^` The result of bitwise XOR operator is *1* if the corresponding bits of two operands are opposite. It is denoted by $\oplus$.

For example, for integers 3 and 5,

```
3 = 00000011 (In Binary)
5 = 00000101 (In Binary)

AND operation     OR operation      XOR operation
  00000011          00000011          00000011
& 00000101        | 00000101        ^ 00000101
 ________          ________          ________
  00000001 = 1      00000111 = 7      00000110 = 6
```

Task
Given set $S = \{1, 2, 3, \ldots, n\}$, find:

- the maximum value of $a\&b$ which is less than a given integer k, where a and b (where $a < b$) are two integers from set S.
- the maximum value of $a|b$ which is less than a given integer k, where a and b (where $a < b$) are two integers from set S.
- the maximum value of $a \oplus b$ which is less than a given integer k, where a and b (where $a < b$) are two integers from set S.

Input Format

The only line contains 2 space-separated integers, n and k, respectively.

Constraints

- $2 \leq n \leq 10^3$
- $2 \leq k \leq n$

Output Format

- The first line of output contains the maximum possible value of $a\&b$.
- The second line of output contains the maximum possible value of $a|b$.
- The second line of output contains the maximum possible value of $a \oplus b$.

Sample Input 0

```
5 4
```

Sample Output 0

```
2
3
3
```

Explanation 0

$n = 5, k = 4$

$S = \{1, 2, 3, 4, 5\}$

All possible values of a and b are:

1. $\mathrm{a} = 1, \mathrm{b} = 2;\ \mathrm{a} \,\&\, \mathrm{b} = 0;\ \mathrm{a} \mid \mathrm{b} = 3;\ \mathrm{a} \oplus \mathrm{b} = 3;$
2. $\mathrm{a} = 1, \mathrm{b} = 3;\ \mathrm{a} \,\&\, \mathrm{b} = 1;\ \mathrm{a} \mid \mathrm{b} = 3;\ \mathrm{a} \oplus \mathrm{b} = 2;$
3. $\mathrm{a} = 1, \mathrm{b} = 4;\ \mathrm{a} \,\&\, \mathrm{b} = 0;\ \mathrm{a} \mid \mathrm{b} = 5;\ \mathrm{a} \oplus \mathrm{b} = 5;$
4. $\mathrm{a} = 1, \mathrm{b} = 5;\ \mathrm{a} \,\&\, \mathrm{b} = 1;\ \mathrm{a} \mid \mathrm{b} = 5;\ \mathrm{a} \oplus \mathrm{b} = 4;$
5. $\mathrm{a} = 2, \mathrm{b} = 3;\ \mathrm{a} \,\&\, \mathrm{b} = 2;\ \mathrm{a} \mid \mathrm{b} = 3;\ \mathrm{a} \oplus \mathrm{b} = 1;$
6. $\mathrm{a} = 2, \mathrm{b} = 4;\ \mathrm{a} \,\&\, \mathrm{b} = 0;\ \mathrm{a} \mid \mathrm{b} = 6;\ \mathrm{a} \oplus \mathrm{b} = 6;$
7. $\mathrm{a} = 2, \mathrm{b} = 5;\ \mathrm{a} \,\&\, \mathrm{b} = 0;\ \mathrm{a} \mid \mathrm{b} = 7;\ \mathrm{a} \oplus \mathrm{b} = 7;$
8. $\mathrm{a} = 3, \mathrm{b} = 4;\ \mathrm{a} \,\&\, \mathrm{b} = 0;\ \mathrm{a} \mid \mathrm{b} = 7;\ \mathrm{a} \oplus \mathrm{b} = 7;$
9. $\mathrm{a} = 3, \mathrm{b} = 5;\ \mathrm{a} \,\&\, \mathrm{b} = 1;\ \mathrm{a} \mid \mathrm{b} = 7;\ \mathrm{a} \oplus \mathrm{b} = 6;$
10. $\mathrm{a} = 4, \mathrm{b} = 5;\ \mathrm{a} \,\&\, \mathrm{b} = 4;\ \mathrm{a} \mid \mathrm{b} = 5;\ \mathrm{a} \oplus \mathrm{b} = 1;$

- The maximum possible value of $a \& b$ that is also $< (k = 4)$ is 2, so we print 2 on first line.
- The maximum possible value of $a | b$ that is also $< (k = 4)$ is 3, so we print 3 on second line.
- The maximum possible value of $a \oplus b$ that is also $< (k = 4)$ is 3, so we print 3 on third line.