**Day 29 - Bitwise AND**

<https://www.hackerrank.com/challenges/30-bitwise-and/problem>

**Objective**  
Welcome to the last day! Today, we're discussing bitwise operations. Check out the [Tutorial](https://www.hackerrank.com/challenges/30-bitwise-and/tutorial) tab for learning materials and an instructional video!

**Task**  
Given set S = {1, 2, 3, …, N}. Find two integers, A and B (where A < B), from set S such that the value of A&B is the maximum possible and also less than a given integer, K. In this case, & represents the bitwise AND operator.

**Function Description**  
Complete the bitwiseAnd function in the editor below.

bitwiseAnd has the following paramter(s):  
- int N: the maximum integer to consider  
- int K: the limit of the result, inclusive

**Returns**  
- int: the maximum value of A&B within the limit.

**Input Format**

The first line contains an integer, T, the number of test cases.  
Each of the T subsequent lines defines a test case as 2 space-separated integers, N and K, respectively.

**Constraints**

* 1 <= T <= 103
* 2 <= N <= 103
* 2 <= K <= N

**Sample Input**

STDIN Function

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3 T = 3

5 2 N = 5, K = 2

8 5 N = 8, K = 5

2 2 N = 8, K = 5

**Sample Output**

1

4

0

**Explanation**

N = 5, K = 2, S = {1, 2, 3, 4, 5}

All possible values of A and B are:

1. A = 1, B = 2; A&B = 0
2. A = 1, B = 3; A&B = 1
3. A = 1, B = 4; A&B = 0
4. A = 1, B = 5; A&B = 1
5. A = 2, B = 3; A&B = 2
6. A = 2, B = 4; A&B = 0
7. A = 2, B = 5; A&B = 0
8. A = 3, B = 4; A&B = 0
9. A = 3, B = 5; A&B = 1
10. A = 4, B = 5; A&B = 4

The maximum possible value of A&B that is also < (K = 2) is 1, so we print 1 on a new line.