Sherlock and Squares ★

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Watson likes to challenge Sherlock's math ability. He will provide a starting and ending value that describe a range of integers, inclusive of the endpoints. Sherlock must determine the number of square integers within that range.

Note: A square integer is an integer which is the square of an integer, e.g. $\mathbf{1, 4, 9, 16, 25}$.

Example

$a = 24$

$b = 49$

There are three square integers in the range: $\mathbf{25, 36}$ and $\mathbf{49}$. Return $\mathbf{3}$.

Function Description

Complete the squares function in the editor below. It should return an integer representing the number of square integers in the inclusive range from a to b.

squares has the following parameter(s):

- int a: the lower range boundary
- int b: the upper range boundary

Returns

- int: the number of square integers in the range

Input Format

The first line contains q, the number of test cases.

Each of the next q lines contains two space-separated integers, a and b, the starting and ending integers in the ranges.

Constraints

$1 \leq q \leq 100$

$1 \leq a \leq b \leq 10^9$

Sample Input

```
2
3 9
17 24
```

Sample Output

```
2
0
```

Explanation

Test Case #00: In range $[3, 9]$, 4 and 9 are the two square integers.

Test Case #01: In range $[17, 24]$, there are no square integers.

Change Theme Language Python 3

```
#!/bin/python3

```

```
import math
import os
import random
import re
import sys

#
# Complete the 'squares' function below.
#
# The function is expected to return an INTEGER.
# The function accepts following parameters:
#  1. INTEGER a
#  2. INTEGER b
#

def squares(a, b):
    # Write your code here
    left = math.ceil(math.sqrt(a))
    right = math.floor(math.sqrt(b))
    return right - left + 1

if __name__ == '__main__':
    fptr = open(os.environ['OUTPUT_PATH'], 'w')

    q = int(input().strip())

    for q_itr in range(q):
        first_multiple_input = input().rstrip().split()

        a = int(first_multiple_input[0])

        b = int(first_multiple_input[1])
```

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Fetching Results

Test case 0 | Test case 4 | Test case 8

Test case 1 | Test case 5 | Test case 9

Test case 2 | Test case 6

Test case 3 | Test case 7