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Number of perfect squares between two given numbers

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Given two given numbers a and b where 1<=a<=b, find the number of perfect squares between a and b (a and b

Examples

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Algo

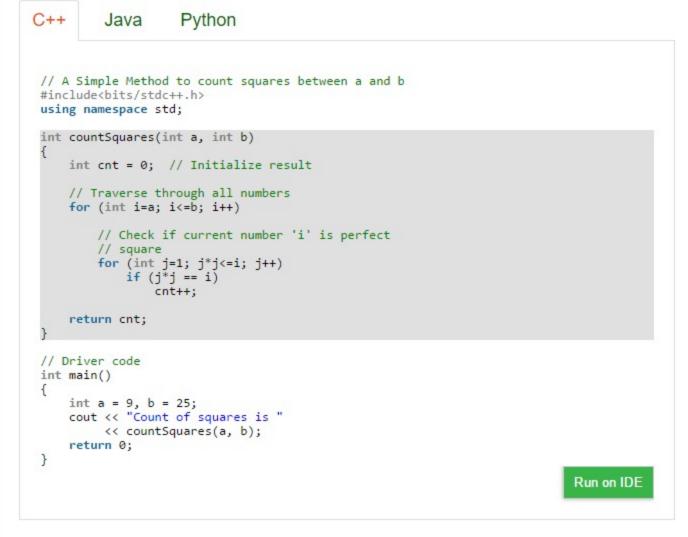
String

```
Input : a = 3, b = 8
Output : 1
The only perfect in given range is 4.
Input : a = 9, b = 25
Output : 3
The three squares in given range are 9,
16 and 25
```

We strongly recommend that you click here and practice it, before moving on to the solution.

Method 1: One naive approach is to check all the numbers between a and b (inclusive a and b) and increase

count by one whenever we encounter a perfect square. Following is the code for the above approach:



Output:

Count of squares is 3

between them using

An upper bound on time Complexity of this solution is O((b-a) * sqrt(b)).

floor(sqrt(b)) - ceil(sqrt(a)) + 1

Method 2 (Efficient) We can simply take square root of 'a' and square root of 'b' and count the perfect squares

```
We take floor of sqrt(b) because we need to consider
 numbers before b.
 We take ceil of sqrt(a) because we need to consider
 numbers after a.
 For example, let b = 24, a = 8. floor(sqrt(b)) = 4,
 ceil(sqrt(a)) = 3. And number of squares is 4 - 3 + 1
 = 2. The two numbers are 9 and 16.
Following is the code for the above approach:
```

Java Python

```
// An Efficient Method to count squares between a and b
#include<bits/stdc++.h>
using namespace std;
// An efficient solution to count square between a
// and b
int countSquares(int a, int b)
    return (floor(sqrt(b)) - ceil(sqrt(a)) + 1);
// Driver code
int main()
    int a = 9, b = 25;
    cout << "Count of squares is "
        << countSquares(a, b);
    return 0;
                                                                            Run on IDE
```

Count of squares is 3

Output:

Time complexity of this solution is O(Log b). A typical implementation of square root for a number n takes time equal to O(Log n) [See this for a sample implementation of square root]

This article is contributed by Rahul Aggarwal. If you like GeeksforGeeks and would like to contribute, you can also write an article and mail your article to contribute@geeksforgeeks.org. See your article appearing on the GeeksforGeeks main page and help other Geeks.

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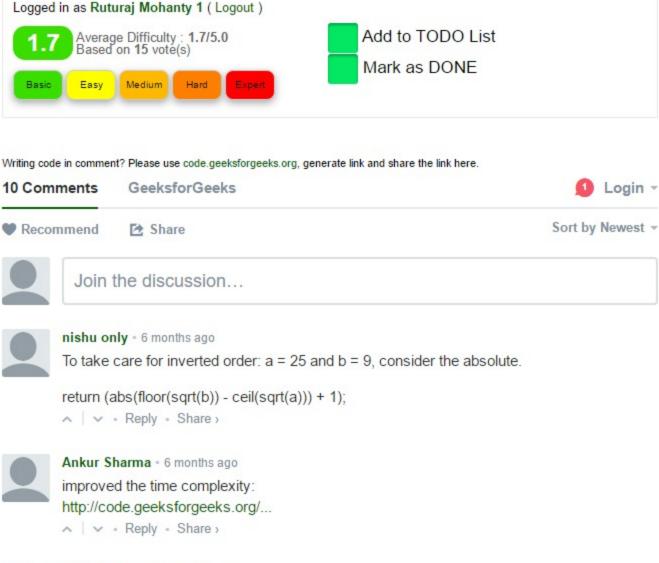
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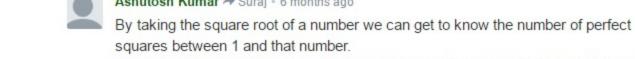
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Suraj - 6 months ago Why taking perfect square of the upper and the lower bound and calculating the perfect



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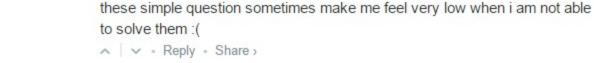
∧ V - Reply - Share > Ashutosh Kumar → Suraj - 6 months ago

squares between 1 and that number. If we subtract two such values, what'd be left is nothing but the number of perfect squares between the two numbers.

not able to think of this approach why????????

(ceil() and floor() are used just for inclusion/exclusion purposes, as the case may 1 ^ V - Reply - Share

Suraj - Ashutosh Kumar - 6 months ago Why i was not able to think of a solution like this, am i weak in something,



Ashutosh Kumar → Suraj - 6 months ago Practice is the key. Start practicing from today, you'll start feeling the difference in a week or so.

No point feeling low, we've got a community like this to help each other out. Cheers mate!

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Suraj Ashutosh Kumar - 6 months ago Thanks ashutosh:) For Boosting

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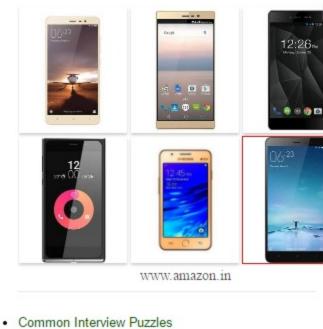
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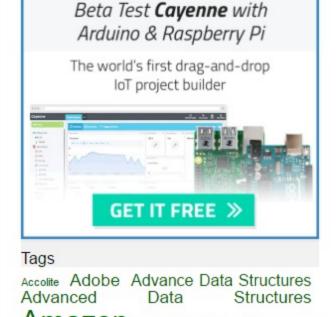
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squares between them is giving the right ans ?? i saw this question on hackerRank but was

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