829. Consecutive Numbers Sum

DescriptionHintsSubmissionsDiscussSolution

Given a positive integer `N`, how many ways can we write it as a sum of consecutive positive integers?

Example 1:

```
Input: 5
Output: 2
Explanation: 5 = 5 = 2 + 3
```

Example 2:

```
Input: 9
Output: 3
Explanation: 9 = 9 = 4 + 5 = 2 + 3 + 4
```

Example 3:

```
Input: 15
Output: 4
Explanation: 15 = 15 = 8 + 7 = 4 + 5 + 6 = 1 + 2 + 3 + 4 + 5
```

Note: `1 <= N <= 10 ^ 9`.

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Let the sequence first number is a, the last number is b;
so n = (a+b) * (b-a+1) / 2;
2n = (a+b) * (b-a+1);

now, enumerate the factor of 2*n, they are i and j;
b = (j + i - 1)/2, a = (j - i + 1)/2;
so j + i shoule be odd, this is the code following:

```
int consecutiveNumbersSum(int n)
{
    int ret = 1;
    n *= 2;
    int bound = (int)sqrt(n);
    for (int i = 2 ; i <= bound; ++i)
    {
        if (n % i != 0) continue;

        int j = n / i;
        if (((i + j - 1) & 1) == 0) ++ret;
    }
    return ret;
}
```