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[Dashboard](#) > [Algorithms](#) > [Recursion](#) > [The Power Sum](#)Badge Progress [\(Details\)](#)

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# The Power Sum

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Problem

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Leaderboard

Discussions

Find the number of ways that a given integer,  $X$ , can be expressed as the sum of the  $N^{\text{th}}$  power of unique, natural numbers.

## Input Format

The first line contains an integer  $X$ .

The second line contains an integer  $N$ .

## Constraints

- $1 \leq X \leq 1000$
- $2 \leq N \leq 10$

## Output Format

Output a single integer, the answer to the problem explained above.

## Sample Input 0

```
10
2
```

## Sample Output 0

```
1
```

## Explanation 0

If  $X = 10$  and  $N = 2$ , we need to find the number of ways that **10** can be represented as the sum of squares of unique numbers.

$$10 = 1^2 + 3^2$$

This is the only way in which **10** can be expressed as the sum of unique squares.

## Sample Input 1

```
100
2
```

## Sample Output 1

```
3
```

## Explanation 1

$$100 = 10^2 = 6^2 + 8^2 = 1^2 + 3^2 + 4^2 + 5^2 + 7^2$$

## Sample Input 2

```
100
3
```

## Sample Output 2

```
1
```

## Explanation 2

**100** can be expressed as the sum of the cubes of **1, 2, 3, 4**.

**(1 + 8 + 27 + 64 = 100)**. There is no other way to express **100** as the sum of cubes.

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Max Score: 20



Difficulty: Easy

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C++  

```
1 #include <cmath>
2 #include <cstdio>
3 #include <vector>
4 #include <iostream>
5 #include <algorithm>
6 using namespace std;
7
8 int calculate_ways(int x, int n, int startint = 1) {
9     if (x == 0) {
10         return 1;
11     }
12
13     if (x <= 0 || startint > x) {
14         return 0;
15     }
16
17     return calculate_ways( x - pow(startint, n), n, startint + 1 ) // either include the current number
18         + calculate_ways(x, n, startint + 1); // or don't
19 }
20
21
22 int main() {
23     int x, n;
24     cin >> x >> n;
25
26     cout << calculate_ways(x, n);
27
28     return 0;
29 }
30
```

Line: 1 Col: 1

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