Beautiful Triplets

HackerRank

Given a sequence of integers a, a triplet $(a[i], a[j], a[k])$ is beautiful if:

- $i < j < k$
- $a[j] - a[i] = a[k] - a[j] = d$

Given an increasing sequenc of integers and the value of d, count the number of beautiful triplets in the sequence.

Example
$arr = [2, 2, 3, 4, 5]$
$d = 1$

There are three beautiful triplets, by index: $[i, j, k] = [0, 2, 3], [1, 2, 3], [2, 3, 4]$. To test the first triplet, $arr[j] - arr[i] = 3 - 2 = 1$ and $arr[k] - arr[j] = 4 - 3 = 1$.

Function Description

Complete the *beautifulTriplets* function in the editor below.

beautifulTriplets has the following parameters:

- *int d:* the value to match
- *int arr[n]:* the sequence, sorted ascending

Returns

- *int:* the number of beautiful triplets

Input Format

The first line contains 2 space-separated integers, n and d, the length of the sequence and the beautiful difference.
The second line contains n space-separated integers $arr[i]$.

Constraints

- $1 \leq n \leq 10^4$
- $1 \leq d \leq 20$
- $0 \leq arr[i] \leq 2 \times 10^4$
- $arr[i] > arr[i-1]$

Sample Input

```
STDIN           Function
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```

```
7 3             arr[] size n = 7, d = 3
1 2 4 5 7 8 10  arr = [1, 2, 4, 5, 7, 8, 10]
```

Sample Output

```
3
```

Explanation

There are many possible triplets $(arr[i], arr[j], arr[k])$, but our only beautiful triplets are $(1, 4, 7)$, $(4, 7, 10)$ and $(2, 5, 8)$ by value, not index. Please see the equations below:

$7 - 4 = 4 - 1 = 3 = d$
$10 - 7 = 7 - 4 = 3 = d$
$8 - 5 = 5 - 2 = 3 = d$

Recall that a beautiful triplet satisfies the following equivalence relation:
$arr[j] - arr[i] = arr[k] - arr[j] = d$ where $i < j < k$.