UCF Local Contest (Final Round) — September 11, 2021

K-gap Subsequence

filename: `kgap`
Difficulty Level: `Medium-Hard`
Time Limit: `4 seconds`

A subsequence of a given sequence of integers is a subset of the values in the sequence in the same order. A *k*-gap subsequence of a sequence of integers is a subsequence such that consecutive elements in the subsequence differ by at least *k*. For example, the sequence

3, **12**, **8**, **4**, 2, 5, 1, **9**, 8, 6, **5**, **1**, **7**

has a 4-gap subsequence of 3, 12, 8, 4, 9, 5, 1 and 7 (highlighted in bold above) since

|3 − 12|, |12 − 8|, |8 − 4|, |4 − 9|, |9 − 5|, |5 − 1| and |1 − 7| are all 4 or greater.

The Problem:

Given a sequence and a value of *k*, determine the length of the longest *k*-gap subsequence.

The Input:

The first input line contains two space separated integers: n ($1 \le n \le 300{,}000$), indicating the length of the sequence, and k ($1 \le k \le 10^9$), indicating the value of k for the input case.

The following input line contains n space separated integers. The i^{th} of these integers is a_i ($1 \le a_i \le 10^9$), the i^{th} value of the input sequence.

The Output:

Print the length of the longest *k*-gap subsequence of the input sequence.

Sample Input	**Sample Output**
10 2 1 2 3 2 1 3 1 3 5 6	7
5 12 3 7 14 20 32	3
13 4 3 12 8 4 2 5 1 9 8 6 5 1 7	8