Shooting Game II

Problem Code: SHOOTING2

Design Challenge

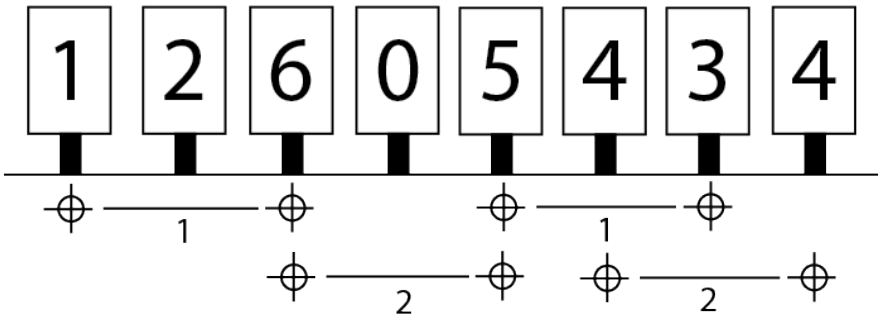
Task Description

You have participated in a shooting game and you had a lot of fun. So what? You play it again!

n targets are arranged ahead of you in a row. Each target has a number of points which will be given to you if you take it down. Your gun is a little special. It can hit m consecutive targets with one fire. But this time, ahha, you can shoot **twice** :). This would probably give you many more points. So you wonder again, what is the maximum points you can get with two shots?

Note that though you can fire twice, each target can award you its points only **once**. However, you may shoot a target twice (you simply get zero points with the second shot). You may also shoot outside the field if you wish (i.e. you may want to aim at the left-most/rightmost target and let your gun range extend beyond the left/right borders).

See below for an example. There are $n = 8$ targets (with their scores written) and your gun has a range of $m = 3$. Last time we shot the 5th, 6th and 7th targets. We can simply aim the second shot at 1st, 2nd and 3rd targets. This is shown below as *Plan 1*. However, this is a sub-optimal plan as you only get $1 + 2 + 6 + 5 + 4 + 3 = 21$ points. Consider *Plan 2* as illustrated. *Plan 2* gives you 22 points and is indeed optimal.



Constraints

$1 \leq m \leq n$, scores are all non-negative integers.

Examples

Case 1: $n = 8, m = 3$, scores are [1, 2, 6, 0, 5, 4, 3, 4]

Answer: 22

See the above illustration.

Case 2: $n = 6, m = 2$, scores are [1, 2, 3, 3, 2, 1]

Answer: 10

Take down the middle four objects.

Case 3: $n = 7, m = 1$, scores are [1, 7, 2, 9, 3, 4, 5]

Answer: 16

Well.. your gun turns out to be not special. So you choose the two targets with the highest and second-highest points.

Case 4: $n = 5, m = 5$, scores are [1, 2, 3, 4, 5]

Answer: 15

Yeah. Your gun is just too powerful to take down everything within one shot. Fire at the air to celebrate using your second shot :D.

Requirements

Time: $O(n)$ **Space:** $O(n)$