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Zonal Computing Olympiad 2010, 12 Dec 2009

10:00 am–1:00 pm IST

Problem 1 : Sequence game

You are given a sequence of N positive integers i_1, i_2, \dots, i_N . In addition, you are given a starting integer b and lower and upper integer limits min and max , respectively. Note that $0 \leq min \leq b \leq max$ always.

The sequence game is played as follows. Initially, your score is b . In step 1, you can either add i_1 to b or subtract i_1 from b to get a new score b_1 . In step 2, you update b_1 by adding or subtracting i_2 to get a new score b_2 . Proceeding in this way, in step j , you update b_{j-1} by adding or subtracting i_j to get a new score b_j . The rule is that each score b_j should always lie between min and max , inclusive: that is, for each j , $1 \leq j \leq N$, it should be the case that $min \leq b_j \leq max$. Your final score is b_N , after using the last number in the sequence.

Your aim is to maximise your final score while playing according to the rules. If there is no way to complete all N steps without going outside the bounds min and max , your score is -1.

For example, suppose the sequence of numbers you have is $[2,3,4]$, b is 5, min is 0 and max is 8. After step 1, the score can be 3 or 7. After step 2, the score can be 0, 4, or 6. A score of 10 is not allowed since max is 8. After step 3, the score can be 0, 2, 4, or 8. Thus, in this game, the maximum score you can obtain at the end of the sequence is 8.

Input format

The first line of the input contains four integers N , b , min and max , whose meaning is as explained above. The second line of input contains N space separated integers, the sequence over which the game is played.

Output format

Your output should be a single line consisting of one integer, the maximum final score that you can achieve.

Testdata

In all cases, $N \leq 10^3$ and $0 \leq min \leq b \leq max \leq 10^3$.

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Sample Input

3 5 0 8
2 3 4

Sample Output

8