

Richness of Special Subsets

locked

Problem	Submissions	Leaderboard
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The efficiency of fulfillment centres is of great importance to Amazon - an efficient and robust network of fulfillment centres not only helps in ensuring fast and timely delivery of products, but can also help in reducing operational costs. Amazon invests huge sums of money in research and development to improve the efficiency of their network of fulfillment centres.

In the city of Tenochtitlan, there is one main fulfillment centre, and all other centers can be reached through this centre. However the roads in this network are unidirectional. Moreover, each center (apart from the main center) has only one incoming road, and at most two outgoing roads, situated on its left and right, connecting it to other centres. Assume that the only product available at these centres is the "Aladdin product". On a daily basis, each centre i reports an integer value V_i , which is either the surplus number of Aladdin products available in its inventory (given as a positive integer), or the number of additional Aladdin products required by that centre to meet the demand (given as a negative integer).

A special subset is a group of fulfillment centres such that the induced network on only those centres turns out to be a binary search tree.

Note : All centers at its left path should have a lesser number than its own, and all centers on the right path should have a higher number than its own.

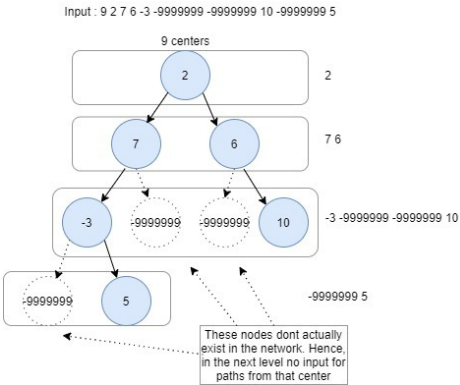
For optimizing the operational costs of this network, the engineers at Amazon calculate the sum of the values reported by all the centres belonging to a special subset, and call it the 'richness' of that special subset.

Find the special subset with the maximum 'richness' within a given network, and print this maximum 'richness' value.

Input Format

The first number is the length of the following input sequence which describes the network.

In the input, the network is specified in the form of a modified level order traversal (left to right) of the network, starting from the main centre. Any non-existent roads are represented with the value of -9999999.



For the above network, there are two special subsets. One is formed by the centers with requirements [7, -3, 5] and the other with the centers having requirements [6, 10]. The richness of the second subset is 16 whereas the first one is only 9. Hence, 16 is printed.

Constraints

$$-4 \times 10^4 \leq V_i \leq 4 \times 10^4$$

$$1 \leq N \leq 2 \times 10^5$$

Output Format

Print a single integer, denoting the maximum 'richness' value over all special subsets in this network.

Sample Input 0

15 1 4 3 2 4 2 5 -9999999 -9999999 -9999999 -9999999 -9999999 -9999999 4 6

Sample Output 0

20

Sample Input 1

5 4 3 -9999999 1 2

Sample Output 1

2

Sample Input 2

7 5 4 8 3 -9999999 6 3

Sample Output 2

7

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Submissions: 258

Max Score: 100

Difficulty: Medium

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C

🗖 ⚙

1▼

#include <stdio.h>

2

#include <string.h>

3

#include <math.h>

4

#include <stdlib.h>

5

6▼

int main() {

7

8▼

/* Enter your code here. Read input from STDIN. Print output to STDOUT */

9

return 0;

10

}

11

Line: 1 Col: 1

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Run Code

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