Problem D
Hypercube Network

Input file: *testdata.in*
Time limit: 4 second

Problem Description

A hypercube network of dimension n is builded by 2^n nodes. And it has the following properties:

- The nodes are identified with a node number in the range 0 ... $2^n - 1$.

- Two nodes are connected if and only if the binary representation of the node number of the two nodes differs in exactly 1 bit.

- The binary representation of nodes in a hypercube of dimension n has n bits.

Now every node in the hypercube is assigned with a weight w. Please find a path with the smallest total weight from s to d.

Technical Specification

1. $t \leq 10$

2. $n \leq 20$

3. $0 \leq s, d \leq 2^N - 1$

4. $w \leq 10000$

Input Format

The first line of the input contains an integer t indicating the number of test cases. There are two lines in each test case, the first line contains three integers n s d. (n indicating the dimension of the hypercube network. s indicating the node number of the start node. d indicating the node number of the end node.) The second line is the weight of every node in the hypercude network with dimension n. Every number is seperated by a space.

Output Format

For each test case, output the smallest total weight of the path from s to d in a single line.

Sample Input

```
2
2 3 3
1 2 3 4
2 0 1
1 2 3 4
```

Sample Output

```
4
3
```