

# Re-Arrange II

For a sequence of N integers,  $A_1, A_2, \dots, A_N$

We can calculate the stability factor P, as

$P = \text{sum of all } (\text{abs}(A_i - A_{i-1}) * C[i]) \text{ where } 2 \leq i \leq N$

$C[i]$  is the cost of putting a number at position i

Your task is find the minimum P for the given N numbers considering all the different permutations of them.

## Input

First line contains an integer T ( $1 \leq T \leq 10$ ) which denotes the total number of test cases. Each test case consists of three lines.

The first line contains the integer N ( $1 \leq N \leq 15$ ). The second line contains a space separated list of N integers ( $< 150$ ) which denote the given set of numbers.

The third line contains a space separated list of N integers. The ith integer on this line denotes the value for  $C[i]$  ( $1 \leq C[i] < 150$ )

## Output

For each test case, print the minimum possible value of P considering all permutations of the given numbers.

## Example

**Input:**

```
1
5
1 8 3 6 5
1 2 3 4 5
```

**Output**

```
24
```

One of the possible permutation of given numbers which has  $p = 24$  is 1, 3, 5, 6, 8