

[CONTESTS](#) | [PROBLEMS](#) [SUBMISSIONS](#) [SUBMIT](#)

Genius

time limit per test: 2 seconds
 memory limit per test: 32 megabytes
 input: standard input
 output: standard output

Please note the non-standard memory limit.

There are n problems numbered with integers from 1 to n . i -th problem has the complexity $c_i = 2^i$, tag tag_i and score s_i .

After solving the problem i it's allowed to solve problem j if and only if $IQ < |c_i - c_j|$ and $tag_i \neq tag_j$. After solving it your IQ changes and becomes $IQ = |c_i - c_j|$ and you gain $|s_i - s_j|$ points.

Any problem can be the first. You can solve problems in any order and as many times as you want.

Initially your $IQ = 0$. Find the maximum number of points that can be earned.

Input

The first line contains a single integer t ($1 \leq t \leq 100$) — the number of test cases.

The first line of each test case contains an integer n ($1 \leq n \leq 5000$) — the number of problems.

The second line of each test case contains n integers $tag_1, tag_2, \dots, tag_n$ ($1 \leq tag_i \leq n$) — tags of the problems.

The third line of each test case contains n integers s_1, s_2, \dots, s_n ($1 \leq s_i \leq 10^9$) — scores of the problems.

It's guaranteed that sum of n over all test cases does not exceed 5000.

Output

For each test case print a single integer — the maximum number of points that can be earned.

Example

input
5
4
1 2 3 4
5 10 15 20
4
1 2 1 2
5 10 15 20
4
2 2 4 1
2 8 19 1
2
1 1
6 9
1
1
666
output
35
30
42
0
0

Note

In the first test case optimal sequence of solving problems is as follows:

1. $1 \rightarrow 2$, after that total score is 5 and $IQ = 2$
2. $2 \rightarrow 3$, after that total score is 10 and $IQ = 4$
3. $3 \rightarrow 1$, after that total score is 20 and $IQ = 6$
4. $1 \rightarrow 4$, after that total score is 35 and $IQ = 14$

In the second test case optimal sequence of solving problems is as follows:

1. $1 \rightarrow 2$, after that total score is 5 and $IQ = 2$
2. $2 \rightarrow 3$, after that total score is 10 and $IQ = 4$
3. $3 \rightarrow 4$, after that total score is 15 and $IQ = 8$
4. $4 \rightarrow 1$, after that total score is 35 and $IQ = 14$

In the third test case optimal sequence of solving problems is as follows:

1. $1 \rightarrow 3$, after that total score is 17 and $IQ = 6$
2. $3 \rightarrow 4$, after that total score is 35 and $IQ = 8$
3. $4 \rightarrow 2$, after that total score is 42 and $IQ = 12$