Monosodium Glutamate

MSG, or *monosodium glutamate*, known colloquially in Vietnam as *bột ngọt*, *mì chính*, or *vị tinh*, is a flavor enhancer commonly used in Vietnamese cuisine. MSG is known for its ability to provide *umami* flavor to soups, broths, and stir-fried dishes. In short, to quote a certain Malaysian uncle, MSG stands for "Make Sh't Good". *Fuiyoh!*

Minh has just opened a restaurant. His menu consists of n dishes, where the i-th dish is of category c_i. One day, a Malaysian uncle came to his restaurant. After tasting each of Minh's n dishes, he shook his head and exclaimed, "Your food taste like sadness. Where the MSG? MSG is the king of flavor. No wonder your restaurant look empty like my marriage. Haiyaaa..." Minh immediately realized this uncle was the real deal. He decided to take his advice and add MSG to his dishes.

After careful analysis, Minh has determined that adding MSG to the i-th dish will increase its tastiness by a_i (a_i can be negative – despite what the uncle might think, MSG does not Make *All* Sh't Good). Furthermore, adding MSG to multiple dishes of the same category will only affect the *last* dish of that category. In other words, if Minh adds MSG to dishes $i_1 < i_2 < \cdots < i_k$ of the same category, only dish i_k will have its tastiness increased by a_{i_k}, while the tastiness of dishes $i_1, i_2, \ldots, i_{k-1}$ will remain unchanged.

Since Minh is too busy to find the optimal way to add MSG to his dishes, he decided to choose a nonempty segment $[l, r]$ of his menu and add MSG to all dishes $l, l+1, \ldots, r$. Minh wants to know the maximum total increase in tastiness he can achieve among all possible segments $[l, r]$. Please help Minh find the answer.

Input

Each test contains multiple test cases. The first line contains the number of test cases τ ($1 \le \tau \le 10^4$). The description of the test cases follows.

- The first line of each test case contains an integer n ($1 \le n \le 10^6$) – the number of dishes in Minh's menu.
- The second line contains n integers $c_1, c_2, \ldots, c_n$ ($1 \le c_i \le n$) – the categories of Minh's dishes.
- The third line contains n integers $a_1, a_2, \ldots, a_n$ ($-10^9 \le a_i \le 10^9$) – the tastiness increases of Minh's dishes.

It is guaranteed that the sum of n over all test cases does not exceed 10^6.

Output

For each test case, print a single integer – the maximum total increase in tastiness.

Sample Input 1	Sample Output 1
4 3 1 1 2 1 -2 3 4 1 2 3 4 5 6 -7 8 2 1 1 -6 -7 5 1 3 2 3 4 100 -1000000000 1 -100 100	3 12 -6 101

Sample Explanation

In the first test case, the optimal segment is $[3, 3]$ with a total increase of 3. Note that for the segment $[1, 3]$, dishes 1 and 2 are both of category 1, so only dish 2 is affected, and the total increase is only $-2 + 3 = 1$.

In the second test case, all dishes are of different categories, so the total increase of a segment is simply the sum of $a_l, a_{l+1}, \ldots, a_r$. The optimal segment is $[1, 4]$ with a total increase of $5 + 6 + (-7) + 8 = 12$.

In the third test case, every segment has a negative total increase. Since the segment must be nonempty, the optimal segment is $[1, 1]$ with a total increase of -6.

In the fourth test case, the optimal segment is $[1, 5]$. Dishes 2 and 4 are both of category 3, so only dish 4 is affected, and the large decrease of dish 2 is ignored. The total increase is $100 + 1 + (-100) + 100 = 101$.