2822 Merging Sequences Problem

Let S be a sequence of n integers, where $S[k]$ with $1 \leq k \leq n$ denotes the k-th number of S. The *maximum prefix sum* of S, denoted $h(S)$, is defined to be

$$h(S) = \max_{0 \leq j \leq n} \sum_{1 \leq k \leq j} S[k]$$

(Note that the range for j starting from 0 is to ensure $h(S) \geq 0$, because $\sum_{1 \leq k \leq 0} S[k] = 0$.) For example, if

$$\begin{aligned} W &= -2, 1, -3; \\ X &= 1, 2, 4, 3, -1, -5, 2, 0, -1, 3, -2; \\ Y &= -1, 2, 0, 1, 3, -5, 3, 2, 4, -2, -1, \end{aligned}$$

then $h(W) = 0$, $h(X) = 1 + 2 + 4 + 3 = 10$ and $h(Y) = -1 + 2 + 0 + 1 + 3 - 5 + 3 + 2 + 4 = 9$.

For each $i = 1, 2, \ldots, l$, let S_i be a sequence of n_i integers. We say that a sequence S of n numbers is a *merged* sequence of S_1, S_2, $\ldots$, S_l if the following conditions hold.

1. $n = n_1 + n_2 + \cdots + n$.
2. There is a 1-1 mapping f from $\{1, 2, \ldots, n\}$ to $\{(i, j) | 1 \leq i \leq l \text{ and } 1 \leq j \leq n_i\}$ such that if $f(t) = (i, j)$ then $S[t] = S_i[j]$.
3. If $t < t'$, $f(t) = (i, j)$ and $f(t') = (i, j')$, then $j < j'$.

For example, if we have

$$\begin{aligned} S1 &= 1, 3, -5, 2, -2; \\ S2 &= 2, 4, -1; \\ S3 &= -1, 0, 3, \end{aligned}$$

then both X and Y above are merged sequences of S_1, S_2, S_3. The following sequence, however, is not a merged sequence of S_1, S_2, S_3.

$$Z = 1, 3, -5, 2, -2, 2, 4, -1, -1, 3, 0.$$

(Clearly, if the last two numbers 3 and 0 in Z are exchanged, then the resulting sequence is a merged sequence of S_1, S_2, S_3.)

Your job is to produce a merged sequence $S^\star$ of $S_1, S_2, \ldots, S_l$ with minimum $h(S^\star)$. For instance, the following sequence is a merged sequence for the above S_1, S_2, S_3 whose maximum prefix sum is minimized:

$$S^\star = -1, 1, 0, 3, -5, 2, -2, 2, 4, -1, 3.$$

One can verify that $h(S^\star) = -1 + 1 + 0 + 3 - 5 + 2 - 2 + 2 + 4 - 1 + 3 = 6$.

Input

The first line contains a number m with $1 \leq m \leq 10$ indicating the number of test cases. Each of the next m lines lists a test case. Each test case lists those l ($1 \leq l \leq 5$) input sequences separated by numbers 9999. Each test case ends with a number -9999. Two consecutive numbers in a sequence are separated by at least one single space. You may assume that each input sequence consists of at most 100 integers, each of which is between -100 and 100.

Output

For each test case $S_1, S_2, \ldots, S_l$, output its $h(S^\star)$ in a single line.

Sample Input

```
3
1 3 -5 2 -2 9999 2 4 -1 9999 -1 0 3 -9999
5 1 1 9999 -2 -2 -2 9999 10 -20 -9999
-2 1 -3 -9999
```

Sample Output

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6
4
0
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