Problem B. Wash

Time limit: 10 seconds

Mr.Panda is about to engage in his favourite activity doing laundry! He's brought L indistinguishable loads of laundry to his local laundromat, which has N washing machines and M dryers.

The i^{th} washing machine takes W_i minutes to wash one load of laundry, and the i^{th} dryer takes D_i minutes to dry a load of laundry.

At any point in time, each machine may only be processing at most one load of laundry.

As one might expect, Panda wants to wash and then dry each of his L loads of laundry. Each load of laundry will go through the following steps in order:

1. A non-negative amount of time after Panda arrives at the laundromat, Panda places the load in an unoccupied washing machine i.
2. W_i minutes later, he removes the load from the washing machine, placing it in a temporary holding basket (which has unlimited space)
3. A non-negative amount of time later, he places the load in an unoccupied dryer j
4. D_j minutes later, he removes the load from the dryer

Panda can instantaneously add laundry to or remove laundry from a machine. Help Panda minimize the amount of time (in minutes after he arrives at the laundromat) after which he can be done washing and drying all L loads of laundry!

Input

The first line of the input gives the number of test cases, T.

T test cases follow. Each test case consists of three lines. The first line contains three integer L, N, and M.

The second line contains N integers W_1, W_2, $\cdots$, W_N representing the wash time of each wash machine.

The third line contains M integers D_1, D_2, ..., D_M representing the dry time of each dryer.

Output

For each test case, output one line containing "`Case #x: y`", where `x` is the test case number (starting from `1`) and `y` is the minimum time it will take Panda to finish his laundry.

Limits

- $1 \leq T \leq 100$.
- $1 \leq L \leq 10^6$.
- $1 \leq N, M \leq 10^5$.
- $1 \leq W_i, D_i \leq 10^9$.

Sample input and output

Sample Input	Sample Output
2 1 1 1 1200 34 2 3 2 100 10 1 10 10	Case #1: 1234 Case #2: 12