

1286 – Space Shuttle Experiments

Professor Spook is consulting for NASA, which is planning a series of space shuttle flights and must decide which commercial experiments to perform and which instruments to have on board each flight. For each flight NASA considers a set $E = \{E_1, E_2, \dots, E_m\}$ of instruments experiments and the commercial sponsor of E_j has agreed to pay NASA p_j dollars for the results of the experiments.

The experiments use a set $I = \{I_1, I_2, \dots, I_n\}$ of instruments; each experiment E_j requires some of the instruments from the set. The cost of carrying instruments I_k is c_k dollars. And an instrument can be used for multiple experiments.

The professor's job is to determine which experiments to perform and which instruments to carry for a given flight in order to maximize the net revenue, which is the total income from the experiments performed minus the total cost of the instruments carried. Since he is not a programmer, he asked your help.

Input

Input starts with an integer T (≤ 100), denoting the number of test cases.

Each case starts with a line containing two integers m ($1 \leq m \leq 100$) and n ($1 \leq n \leq 100$), where m denotes the number of experiments and n denotes the number of instruments. The next line contains m space separated integers, where the j^{th} integer denotes the commercial sponsor of E_j paying NASA p_j ($1 \leq p_j \leq 10000$) dollars for the result of the experiment. The next line contains n space separated integers, where the k^{th} integer denotes the cost of carrying the k^{th} instrument, c_k ($1 \leq c_k \leq 10000$). Each of the next m lines contains an integer q_i ($1 \leq q_i \leq n$) followed by q_i distinct integers each between 1 and n , separated by spaces. These q_i integers denote the required instruments for the i^{th} experiment.

Output

For each case, print the case number and the maximum revenue NASA can make using the experiments.

Sample Input	Output for Sample Input
2 1 1 10 20 1 1 3 5 20 30 40 1 2 30 4 50 3 1 2 3 3 2 3 4 1 5	Case 1: 0 Case 2: 13