1106 – Gone Fishing

John is going on a fishing trip. He has **h** hours available, and there are **n** lakes in the area all reachable along a single, one-way road. John starts at lake **1**, but he can finish at any lake he wants. He can only travel from one lake to the next one, but he does not have to stop at any lake unless he wishes to. For each **i (1 to n-1)**, the number of **5**-minute intervals it takes to travel from lake **i** to lake **i+1** is denoted t_i. For example, t_3**=4** means that it takes **20** minutes to travel from lake **3** to **4**.

To help plan his fishing trip, John has gathered some information about the lakes. For each lake **i**, the number of fish expected to be caught in the initial **5** minutes, denoted f_i, is known. Each **5** minutes of fishing decreases the number of fish expected to be caught in the next **5**-minute interval by a constant rate of d_i. If the number of fish expected to be caught in an interval is less than or equal to d_i, there will be no more fish left in the lake in the next interval. To simplify the planning, John assumes that no one else will be fishing at the lakes to affect the number of fish he expects to catch. Write a program to help John plan his fishing trip to maximize the number of fish expected to be caught. The number of minutes spent at each lake must be a multiple of **5**.

Input

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

Each case starts with a line containing two integers **n (2 ≤ n ≤ 25)** and **h (1 ≤ h ≤ 16)**. Next, there is a line of **n** integers specifying f_i **(0 ≤** f_i **≤ 1000)**, then a line of **n** integers d_i **(0 ≤** d_i **≤1000)**, and finally, a line of **n-1** integers denoting t_i **(0 <** t_i **< 192)**.

Output

For each test case, print the case number first. Then print the number of minutes spent at each lake, separated by commas, for the plan achieving the maximum number of fish expected to be caught. This is followed by a line containing the number of fish expected. If multiple plans exist, choose the one that spends as long as possible at lake **1**. If there is still a tie, choose the one that spends as long as possible at lake **2**, and so on.

Sample Input	Output for Sample Input
3 2 1 10 1 2 5 2 4 4 10 15 20 17 0 3 4 3 1 2 3 4 4 10 15 50 30 0 3 4 3 1 2 3	Case 1: 45, 5 Number of fish expected: 31 Case 2: 240, 0, 0, 0 Number of fish expected: 480 Case 3: 115, 10, 50, 35 Number of fish expected: 724