

贪心算法也是很巧妙的，有时要做一些转化。

第 17 题: poj 1042 钓鱼

Gone Fishing

Description

John is going on a fishing trip. He has h hours available ($1 \leq h \leq 16$), and there are n lakes in the area ($2 \leq n \leq 25$) 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 $i = 1, \dots, n - 1$, the number of 5-minute intervals it takes to travel from lake i to lake $i + 1$ is denoted t_i ($0 < t_i \leq 192$). For example, $t_3 = 4$ means that it takes 20 minutes to travel from lake 3 to lake 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 ($f_i \geq 0$), 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 ($d_i \geq 0$). 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

You will be given a number of cases in the input. Each case starts with a line containing n . This is followed by a line containing h . Next, there is a line of n integers specifying f_i ($1 \leq i \leq n$), then a line of n integers d_i ($1 \leq i \leq n$), and finally, a line of $n - 1$ integers t_i ($1 \leq i \leq n - 1$). Input is terminated by a case in which $n = 0$.

Output

For each test case, 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 (you should print the entire plan on one line even if it exceeds 80 characters). 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, even if no fish are expected to be caught in some intervals. If there is still a tie, choose the one that spends as long as possible at lake 2, and so on. Insert a blank line between cases.

Sample Input

```
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
0
```

Sample Output

```
45, 5
Number of fish expected: 31

240, 0, 0, 0
Number of fish expected: 480

115, 10, 50, 35
Number of fish expected: 724
```

题目大意：

一个人打算在编号 $1 \sim n$ 的湖里钓鱼，钓鱼是单向走的，不能往回走。给你 n 个湖，每个湖初始鱼的数量 p_i ，每次每个湖钓鱼后鱼的减少量 d_i ，第 i 个湖到第 $i+1$ 湖的距离时间 t_i （单位是 5min），可以在任何湖停止钓鱼。求如何钓鱼才能才能在 h 小时内钓鱼量最多。输出在每个湖钓鱼的时间。相同钓鱼量情况下，输出湖编号小的用时多的时间。

第 18 题: POJ 1328 Radar Installation

Radar Installation

Description Assume the coasting is an infinite straight line. Land is in one side of coasting, sea in the other. Each small island is a point locating in the sea side. And any radar installation, locating on the coasting, can only cover d distance, so an island in the sea can be covered by a radar installation, if the distance between them is at most d .

We use Cartesian coordinate system, defining the coasting is the x -axis. The sea side is above x -axis, and the land side below. Given the position of each island in the sea, and given the distance of the coverage of the radar installation, your task is to write a program to find the minimal number of radar installations to cover all the islands. Note that the position of an island is represented by its x - y coordinates.

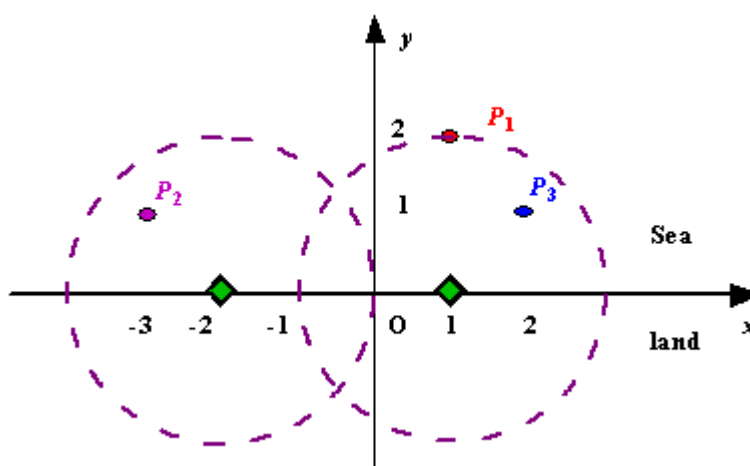


Figure A Sample Input of Radar Installations

Input

The input consists of several test cases. The first line of each case contains two integers n ($1 \leq n \leq 1000$) and d , where n is the number of islands in the sea and d is the distance of coverage of the radar installation. This is followed by n lines each containing two integers representing the coordinate of the position of each island. Then a blank line follows to separate the cases.

The input is terminated by a line containing pair of zeros

Output

For each test case output one line consisting of the test case number followed by the minimal number of radar installations needed. "-1" installation means no solution for that case.

Sample Input

```
3 2
1 2
-3 1
2 1

1 2
0 2

0 0
```

Sample Output

```
Case 1: 2
Case 2: 1
```

题目大意：

假设海岸线是一条无限延伸的直线。陆地在这条线的一侧，而海洋在另一侧。每一个小的岛屿是海洋上的一个点。雷达坐落于海岸线上，只能覆盖 d 距离，所以如果小岛能够被覆盖到的话，它们之间的距离最多为 d 。计算出能够覆盖给出的所有岛屿的最少雷达数目。

提示：区间覆盖问题

第 19 题: POJ 3040 Allowance

Allowance

Description

As a reward for record milk production, Farmer John has decided to start paying Bessie the cow a small weekly allowance. FJ has a set of coins in N ($1 \leq N \leq 20$) different denominations, where each denomination of coin evenly divides the next-larger denomination (e.g., 1 cent coins, 5 cent coins, 10 cent coins, and 50 cent coins). Using the given set of coins, he would like to pay Bessie at least some given amount of money C ($1 \leq C \leq 100,000,000$) every week. Please help him compute the maximum number of weeks he can pay Bessie.

Input

* Line 1: Two space-separated integers: N and C

* Lines 2.. $N+1$: Each line corresponds to a denomination of coin and contains two integers: the value V ($1 \leq V \leq 100,000,000$) of the denomination, and the number of coins B ($1 \leq B \leq 1,000,000$) of this denomination in Farmer John's possession.

Output

* Line 1: A single integer that is the number of weeks Farmer John can pay Bessie at least C allowance

Sample Input

```
3 6
10 1
1 100
5 120
```

Sample Output

```
111
```

Hint

INPUT DETAILS:

FJ would like to pay Bessie 6 cents per week. He has 100 1-cent coins, 120 5-cent coins, and 1 10-cent coin.

OUTPUT DETAILS:

FJ can overpay Bessie with the one 10-cent coin for 1 week, then pay Bessie two 5-cent coins for 10 weeks and then pay Bessie one 1-cent coin and one 5-cent coin for 100 weeks.

题目大意：

农夫要给奶牛 Bessie 每周津贴。农夫有 N 种不同面额不同数量的硬币，而且相邻大小的硬币面额存在整除关系（1 分、5 分、10 分、50 分）。他每周至少要给奶牛 C 分钱，计算他所有的钱最多可以给奶牛多少周。

提示：存在从大到小和从小到大的两个方向的贪心。

第 20 题: POJ1700 Crossing River

Crossing River

Description

A group of N people wishes to go across a river with only one boat, which can at most carry two persons. Therefore some sort of shuttle arrangement must be arranged in order to row the boat back and forth so that all people may cross. Each person has a different rowing speed; the speed of a couple is determined by the speed of the slower one. Your job is to determine a strategy that minimizes the time for these people to get across.

Input

The first line of the input contains a single integer T ($1 \leq T \leq 20$), the number of test cases. Then T cases follow. The first line of each case contains N , and the second line contains N integers giving the time for each people to cross the river. Each case is preceded by a blank line. There won't be more than 1000 people and nobody takes more than 100 seconds to cross.

Output

For each test case, print a line containing the total number of seconds required for all the N people to cross the river.

Sample Input

```
1
4
1 2 5 10
```

Sample Output

```
17
```

题目大意:

每个人过河都有自己的过河时间。有 n 个人想过河，但只有一只小船，最多只能装 2 个人。每一次过河，过河时间为用时最多的人过河时间，如果还有人没有过河，那么过去一个用时最少的送回船。问 n 人过河最少要多少时间。

选做：第 21 题：POJ 2586

Y2K Accounting Bug

Description

Accounting for Computer Machinists (ACM) has suffered from the Y2K bug and lost some vital data for preparing annual report for MS Inc.

All what they remember is that MS Inc. posted a surplus or a deficit each month of 1999 and each month when MS Inc. posted surplus, the amount of surplus was s and each month when MS Inc. posted deficit, the deficit was d . They do not remember which or how many months posted surplus or deficit. MS Inc., unlike other companies, posts their earnings for each consecutive 5 months during a year. ACM knows that each of these 8 postings reported a deficit but they do not know how much. The chief accountant is almost sure that MS Inc. was about to post surplus for the entire year of 1999. Almost but not quite.

Write a program, which decides whether MS Inc. suffered a deficit during 1999, or if a surplus for 1999 was possible, what is the maximum amount of surplus that they can post.

Input

Input is a sequence of lines, each containing two positive integers s and d .

Output

For each line of input, output one line containing either a single integer giving the amount of surplus for the entire year, or output Deficit if it is impossible.

Sample Input

```
59 237
375 743
200000 849694
2500000 8000000
```

题目大意：

有一个公司由于 Y2K 病毒使公司盈亏数据丢失，但该公司每月的盈亏是一个定数，要么一个月赢利 s ，要么一月亏 d 。现在 ACM 只知道该公司每五个月有一个盈亏报表，而且每次报表赢利情况都为亏。在一年中这样的报表总共有 8 次（1 到 5，2 到 6， \dots ，8 到 12），现在要编一个程序确定当赢 s 和亏 d 给出，并满足每张报表为亏的情况下，全年公司最高可赢利多少，若存在，则输出多多额，若不存在，输出“Deficit”。

提示：更多的是枚举。