

**DEPARTMENT OF CENTRE OF EXCELLENCE**

**DATA STRUCTURES**

**1.There are two cars-one running with petrol and other running with diesel with following information:**

**Petrol diesel**

**Distance/Liter in kilometers/liter: (A) A1 A2**

**Fuel-cost/Liter: (B) B1 B2**

**Showroom Price: (C ) C1 C2**

**Average Monthly Run in kilometers: (D) D1 D2**

**Maintenance Cost per month: (E) E1 E2**

**We need to find out which car has the lowest total cost, aver a horizon of 60 months.**

**Constraints**

1 <A <= 50

1<B<=100

10^5<C<= 10^9

1<D<10^4

1<E<= 10^4

**- Input**

The input has 10 lines, with each line containing one integer

The first line contains an integer A1 denoting distance/Liter (Mileage) for petrol car

The second line contains an-integer B1 denoting fuel-cost/Liter for petrol

The third line contains an integer C1 denoting showroom Price for petrol

The fourth line contains an integer D1 denoting average Monthly Run in kilometres for petrol car

The fifth line contains an integer E1 denoting maintenance Cost per month for petrol car

The sixth line contains an integer A2 denoting distance/Liter (Mileage) fo The seventh line contains an integer B2 denoting fuel-cost/Liter for diesel car

The eighth line contains an integer C2 denoting showroom Price for diese The ninth line contains an integer D2 denoting average Monthly Run in kilometres for diesel car

The tenth line contains an integer E2 denoting maintenance Cost per month for diesel car

**Output**

Print "petrol" if petrol car is more cost efficient or print "diesel" if diesel car is more cost efficient.

**2.plumber wants to check whether a pipe junction where N incoming pipes and M outgoing pipes are balanced, and, if not, needs to balance the junction by adding an input pipe oran output pipe of a suitable capacity.**

**At the junction, there are a set of input pipes and a set of output pipes. Each pipe has a rated capacity and an actual capacity The actual capacity for each pipe is lower than the rated capacity by a constant R, the 'rust factor, which depends on the material of the pipe, and is the same for all the pipes at the junction. For example, if the rated capacity is 65 and is 2 the actual capacity is 63**

**A junction is balanced if the sum of the actual capacities of the input pipes is the same as the sum of the actual capacities of the output pipes if it is not balanced, the plumber add one input pipe or one output pipe to balance the junction, and determine the rated capacity of that added pipe A**

**Here we have N incoming pipes and M outgoing pipes. The incoming pipes may be of different rated capacities Similarly, the outgoing pipes may also be of different rated capacities**

**Find the rated capacity of the pipe required to make the junction balanced if the combined actual capacity of the incoming pipes is more than the combined actual capacity of the outgoing pipes then the plumber will need to add an outgoing pipe Conversely, if the combined actual capacity of the incoming pipes is less than the combined actual capacity of the outgoing pipes then the plumber will need to add an incoming pipe**

**if an outgoing pipe is added then denote its rated capacity as a negative number if an incoming pipe is added then denote its rated capacity as a positive arbe**

**-Constraints**

1<=N,M,R,<= 1000

1<=Incoming[i] Outgoing[i]<=10000

**Input**

The input has three lines

The first line contains three space separated integers N M R denoting the number of incoming pipes, outgoing pipes and rust factor respectively.

The second line contains N space separated integers denoting the rated capacity of each incoming pipe.

The third line contains M space separated integers denoting the rated capacity of each outgoing pipe.

**Output**

Print the rated capacity of the pipe required to balance the junction OR print "BALANCED if the junction is already balanced.

**Time Limit**

1

**Explanation**

**Example 1**

**Input**

3 3 2

85 75 95

70 80 45

**Output**

-62

**Explanation**

There are 3 input pipes, 3 output pipes, and the rust factor is 2.

The rated capacities of the input pipes are85,75 and 95 respectively.

**3. Traveler wants to start his/her journey from Pune to Ahmedabad. Before starting the journey, he/she uses the GPS system to find all the paths to reach from the source to the destination. He/she will use the smallest or the second smallest path to start the journey. Write a logic to find the smallest and the second smallest distance from the list of all distances.**

**Input**

The first input contains N, the total number of paths from the source to the destination..

2. The second input contains N sorted integers separated by newline A1, A2... An, representing the distance of all paths.

**Output**

Output contains two numbers separated by a single space character.

If all paths are equal, then the system should generate a message as "Equal".

If N is less than 2, then the system should generate a message as "Invalid Input".

**Constraints**

2 <N<= 10

1 <= A[i]<= 1000

**Example 1:**

INPUT

4

100

400

300

250

**Output**

100 250

**Explanation**

Out of the given 4 possible paths, only 100 are the smallest distances to reach the des

**Example 2:**

Input

1

200

**Output**

Invalid Input

**4. Auction Number**

Vechile problem

-**Problem Description**

Codu is fond of vehicle numbers. Codu wants to compute the number of vehicles can be registered in his state. A vehicle normally has a registration number like ST 01 AB 1234. Each registration number has four parts, separated by spaces. The first part has two letters common for all cars in the state. The next two digit number is the number of the district where the car is registered within the state. It is always two digits, and may have a leading zero. After that, the next part consists of two letters (AB) denoting the series and the last part is a 4 digit number (this will always be four digits, even if it has leading zeroes). The entire registration number is unique to each vehicle. You have been given the number of districts in state and a range of letters and a set of digits that can be used for forming a vehicle registration number. You need to find the maximum number of vehicles that can be registered in the state with non-special numbers, subject to the rules

The state has identified some numbers as special, and will not be issued normally, but will only be available by auction. In these plates, the last part (consisting of four digits) has three or more repetitions of one digit such as 0001, 0000, 0100, 2212 so on. The output should consist of the maximum number of vehicles that can be registered in the state with non-special numbers

Constraints

1<= Number of districts < 100

A <=Range of alphabets <= Z

0 <= Range of digits <= 9

Width of district columns will be always equal to 2.

Ex district 1 will be represented as 01.

**Input**

The input has three lines

The first line contains an integer denoting the number of districts in the state.

The second line contains two space separated characters denoting the range of letters that can be used for the third part For example, if the input says BF any of the letters BCDE or F may be used in any combination for the third part

The third line contains space separated integers denoting the range of digits.

**Output**

Print the total number of vehicles that can be registered

-Time Limit

1

Explanation

Example 1

Input

1

AB

01

Output

24

Explanation

Here, only one district is present. Hence, number plate will start from ST D1 AA 0000, ST 01 AA 0001, etc. However, we need to exclude auction-able numbers. After doing so , the overay count of non special vehicle registration numbers remains 24. For example, ST 01 AA 0011, ST 01 ST 0110.. so on.

Example 2

Input

2

AC

12

Output

108

Explanation

Here, two districts are present Number plate can start from STI21 or ST 02 Hence number plate will start from ST 01 AA 1111, ST 01 AA 1112, etc. Howe, we need to exclude auction able numbers. After doing so, the overall count of non-special vehicle registration numbers remains 108 For example, ST 02 AC 2121, 31 02 BC 2112, ST 02 AA 1122 so on.

**5. An e-commerce website wishes to find the lucky customer who will**

**be eligible for full value cash back. For this purpose, a number N is fed**

**to the system. It will return another number that is calculated by an**

**algorithm. In the algorithm, a sequence is generated, in which each**

**number is the sum of the two preceding numbers. Initially the**

**sequence will have two 1’s in it. The system will return the Nth number**

**from the generated sequence which is treated as the order ID. The**

**lucky customer will be the one who has placed that order.**

**Write an algorithm to help the website find the lucky customer.**

**Input**

The input consists of an integer token, representing the number fed to

the system (N).

**Output**

Print an integer representing the order ID of the lucky customer.

Example

Input:

8

Output:

21