Day 2 Question 1: Packet Routing

Your solution: N:\packet\packet.{pas,c,cpp}
Input file: packet.in
Output file: packet.out

The date is October 29th, 1969. Today, scientists at UCLA made history by exchanging data between two computers over a network. The transmission wasn't very spectacular: only the first two letters of the word "login" were received before the system crashed. Nevertheless, the researchers are beginning to design larger computer networks and they need your help.

A computer network is a collection of N ($2 <= N <= 100$) computers and W wires. The computers are identified by the numbers 1, 2, ..., N. Each wire connects exactly two computers, allowing packets of data to flow in both directions between the computers. The wires are placed so that it is possible to send packets (directly or indirectly by passing through other computers) between every pair of computers. In fact, the placement of the wires has been optimized so that there is exactly one path between every pair of computers. If the packet travels along several wires to get from the source computer to the destination computer, the time needed for the packet to travel along this path is the sum of the times required for the packet to travel along each individual wire. You are to write a program that computes the amount of time needed for a packet to travel between a given pair of distinct computers.

Input

The first line of the input file contains the three positive integers N, W, P.
For each wire, a line follows giving the identification numbers of the two computers connected by the wire, and an integer between 1 and 500 giving the time required for a packet to travel along this wire.
P ($1 <= P <= 10000$) is the number of packets which need to be sent. For each packet, a line follows giving the identification numbers of the packet's source and destination computers.

Output

For each packet, find the route through the network which will allow the packet to travel from the source computer to the destination computer. Output the travel time of this route on a single line.

Sample Input

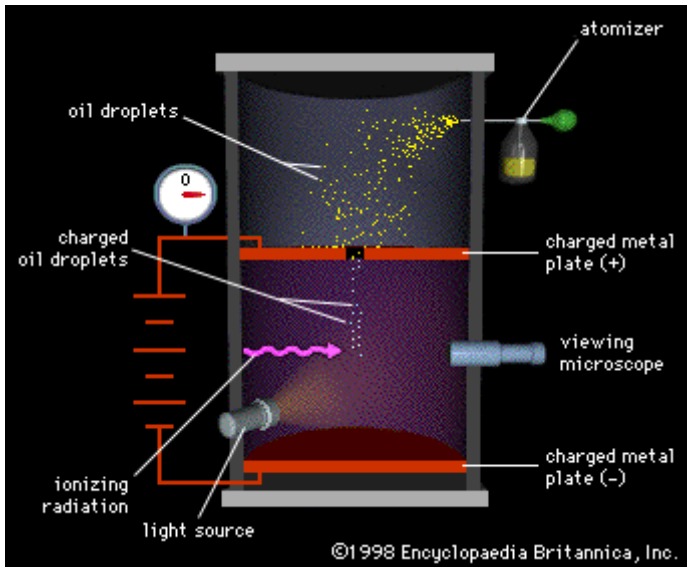
```
3 2 3
1 2 100
2 3 150
2 1
2 3
1 3
```

Output for Sample Input

100
150
250

Day 2 Question 2: Millikan's Oil Droplet Experiment

Your solution: N:\oil\oil.{pas,c,cpp}
Input file: oil.in
Output file: oil.out



Millikan's famous Oil Droplet Experiment showed that electrical charge is quantized; that is that the electrical charge on any object is the sum of a number of elementary electrical charges. The electron is the most common subatomic particle that carries a single elementary electrical charge.

Millikan's experiment involved measuring the charge on several oil droplets, and showing that each charge was a multiple of some smaller charge. Your friend, the physics enthusiast, has to reproduce Millikan's experiment. She has looked after constructing the apparatus and taking the measurements. Her measurements are pretty good for what can be achieved in a high school laboratory: the maximum error on any given measurement is +/- 1%.

Given the measurements as input, your program must find the maximum possible value for the elementary charge consistent with the measurements. That is, each measurement, plus or minus an error of 1% or less, must be a multiple of the elementary charge.

The input contains an integer n (1 <= *n* <= 100), the number of oil droplets. This is followed by *n* real numbers on a single line; these represent the charge measured on each droplet. The output should be a single number, the maximum possible elementary charge, correct to 4 decimal places.

Sample Input

```
3
3.01  5.93  12.07
```

Output for Sample Input

```
2.9947
```

Day 2 Question 3: Extension Cords

Your solution: N:\cords\cords.{pas,c,cpp}
Input file: cords.in
Output file: cords.out

Harry the handyman needs to plug in his table saw and his arc welder at his work location. Since they each draw a lot of current, he must plug them into outlets on two different electrical circuits. Several outlets are available; each outlet is on one of several circuits. Harry has a number of extension cords of various lengths. Can Harry join some of his extension cords together so as to plug in the saw and the welder to different circuits at the same time?

The first line of input contains four numbers: *x*, *y*, *n*, *m*. *x* and *y*, both real numbers, give the coordinates of Harry's work location. *n*, an integer between 1 and 100, gives the number of extension cords. *m*, an integer between 1 and 100, gives the number of outlets. For each extension cord, a line follows which gives its length, a positive integer less than 500. For each outlet, a line follows containing *a*, *b*, and *c*. *a* and *b*, both real numbers, give the coordinates of the outlet. *c*, an integer, gives the circuit number to which the outlet is connected.

There are no obstructions on the floor so Harry can run a string of cords directly from any outlet to his work location.

If Harry can plug in his equipment, print the coordinates of any pair of outlets to which Harry can connect, in the format below. Otherwise, print "Harry is helpless."

Sample Input

```
100.0 100.0 3 3
7
8
6
100.0 106.0 1
110.0 90.0 2
89.0 111.0 3
```

Possible Output for Sample Input

```
Harry can connect to outlets at (100.0, 106.0) and (110.0, 90.0).
```