Problem A: Running the Numbers

By: Sarah Goldfarb and Samantha Unger

Emma is an avid runner, who especially loves to run laps around the track. She runs laps around her school track, the track at the local park and just about any other track she can find. She also loves counting the total meters she has completed after each lap, or her final, partial lap! However, Emma is still training and is only able to run a particular amount of meters on a given day. Using Emma's maximum running distance and number of meters in one lap, output the distance Emma has run after each lap (or portion of the final lap).

Input Specification:
The first line will contain integers L and M ($0 < L, M < 10{,}000$), separated by a space. L represents the number of meters in one lap. M represents the maximum distance, in meters, that Emma is able to run.

Output Specification:
Output the distance completed after each lap (or final partial lap), separated by ", ".

Sample Input 1:
400 1260

Sample Output 1:
400, 800, 1200, 1260

Sample Input 2:
500 200

Sample Output 2:
200

Problem B: Making the Grade

By: Sarah Goldfarb and Samantha Unger

Matilda is super excited to apply for Mackenzie University and dreams of getting into the program of her choice. Last week, she went online and found out that the minimum admission average for this program is N%. Seeing as Matilda is a proactive student, she decided to approach her 4 teachers to find out what her current marks are. The problem was that only 3 of her teachers were willing to reveal her grade. Help Matilda determine the lowest possible mark she can achieve in her remaining course, while still obtaining the minimum admission average!

Input Specification:
The first line will contain integer N ($60 \leq N \leq 95$). The second line will contain three space-separated integers X, Y, and Z. N represents the overall average that Matilda must obtain. X, Y, and Z represent the averages that Matilda currently has. Matilda will always be able to obtain an N admission average without having to receive over 100% in her last course.

Output Specification:
Output the lowest possible mark (will always be an integer) that Matilda must receive in her last course in order to obtain the minimum admission average.

Sample Input 1:
73
70 68 75

Sample Output 1:
79

Sample Input 2:
88
67 88 97

Sample Output 2:
100

Problem C: Creating Cookie Perfection

By: Sarah Goldfarb and Samantha Unger

Monica dreams of being a food chemist when she grows up and she's already taking steps to achieve her goal. Today, she aims to perfect her chocolate chip cookie recipe because nothing could be more important than that! She has sponsors who supply her with unlimited, free chocolate chips, baking powder, baking soda and other key ingredients. Unfortunately, she could not find any companies that were willing to supply her with eggs, sugar and flour. Instead, Monica must pay for these missing ingredients using her limited funds. Given the number of units of eggs, sugar and flour that Monica requires and the cost of each, determine how much Monica's batch of cookies will cost her and if she can afford them.

Input Specification:
The first line of input will contain an integer that represents the amount of money Monica has to buy the ingredients. The second line of input will contain space-separated integers N and C ($0 \leq N \leq 10$, $0 \leq C \leq 100$). N represents the number of eggs she needs and C represents the cost of each egg. The third line will contain 2 more space-separated integers. The first will represent the number of sugar portions she needs and the second will represent the cost of a sugar portion. The fourth line will also contain 2 space-separated integers, representing the number of flour portions and the cost of each portion.

Output Specification:
Output the cost of all of the ingredients Monica wants to buy and whether or not she can afford it with the money she has. Ensure that the output sentence format is identical to that specified in the sample outputs.

Sample Input 1:
100
7 2
3 5
1 6

Sample Output 1:
Monica can afford $35.

Sample Input 2:
20
3 5
1 3
4 2

Sample Output 2:
Monica cannot afford $26.

Problem D: Keeping an Eye on the Neighbourhood Spies

By: Sarah Goldfarb and Samantha Unger

Agent Cody and Agent Hannah are affectionately known as the neighbourhood spies. They've got their eyes set on keeping the community safe from mysterious cookie salesmen, creepily ambitious students and shady lap-runners. Being amazing spies, they know that they must always communicate in code.

Cody and Hannah have given you a challenge: to decode an encrypted message. To decrypt the message you need to increase the each letter by N. For example, if N=3 and the encoded (input) letter is 'A', the decoded (output) letter would be 'D'. Since the alphabet goes in a circle, the letter 'A' could be obtained by using the encoded letter 'X'. Then, within each word, you must swap each odd-numbered letter with the letter on its right. So you must swap the first letter with the second, the third letter with the fourth and so on. Words are separated with hyphens. If there's an odd number of letters in a given word, leave the final letter as-is. Finally, you must replace all of the hyphens with spaces to make a coherent sentence.

Input Specification:
The first line will contain the integer N ($1 \leq N \leq 30$). This is the value by which the characters must be increased. The second line contains the sentence (in all capitals) Agent Cody and Agent Hannah must decode. A space is represented by a hyphen, "-".

Output Specification:
Output the decoded message (spaces instead of hyphens) in all capital letters.

Sample Input 1:
2
CU-MJCT-PNEMYPKKLGE

Sample Output 1:
WE LOVE PROGRAMMING

Sample Input 2:
5
DRGGVDH-TGIJ-VHFXIZDUZ-DX

Sample Output 2:
WILLIAM LYON MACKENZIE CI

Problem E: Catching the Ball

By: Sarah Goldfarb and Samantha Unger

Students are playing catch in the school's field. The field is conveniently broken up into 1m by 1m squares and each individual is standing in the centre of a square (note that not every square has a person). The students will continue to play catch until the ball is thrown into a square where there are no students. At the end of the game, the students always calculate how far the ball has travelled in total to the nearest hundredth of a meter.

Input Specification:
The first line will contain the integers R and C ($2 \leq R, C \leq 10$). The next R lines will contain C digit long numbers, which each represent a square on the field. The value 0 represents the absence of a person. The value 1 represents the presence of a person. The value 2 represents the person who starts with the ball.
The next lines contain the coordinates to which the ball is thrown (the top left corner would be 0,0) in the format R, C (so the top right corner would be 0, C-1). The throwing only stops when the ball is thrown to a spot with no person.

Output Specification:
Output the distance the ball has travelled to the nearest tenth of a meter. Include the distance of final throw that goes from the last person to the ground.

Sample Input 1:
```
3 5
00200
00010
11000
1 3
2 0
2 1
0 1
```

Sample Output 1:
```
7.58
```

Sample Input 2:
```
3 3
002
100
000
0 0
```

Sample Output 2:
```
2.00
```

Problem F: Combination Lock

By: Reyno Tilikaynen

Anna has a combination lock with numbers from 1 to N. The combination has M numbers. The lock starts at position 1. The lock works by alternating turning directions to reach the required numbers, starting with turning right (counting up). Help Anna find how many numbers she has to turn through to open her lock.

Input Specification:
The first line contains two space separated integers, N M ($1 < M \leq N \leq 1{,}000{,}000$). The second line contains M space separated integers: the combination of the lock. For 60% of the points, $N < 1{,}000$.

Output Specification:
A single integer, the numbers that Ana has to turn through to unlock her lock.

Sample Input 1:
5 5
1 2 3 4 5

Sample Output 1:
10

Sample Input 2:
10 2
5 5

Sample Output 2:
14