Question 1 (10 marks)

Bob is writing a program that solves the following problem:

You are given the numbers *a, b* to display the infinite sequence of numbers $a,a+b,a+2*b$ ...,$a+N*b,a+(N+1)*b$,.... Bob has made a mistake, he namely forgot to draw a space for the separation between the numbers, resulting in a long line of numbers. In order not to correct the mistake, Bob decided to find out how to find the k^{th} digit in the formed line (numbering of digits begins with one).

Bob could not find a good solution, so he asks you for help.

Input format

- The first line contains a number *T* denoting the number of tests.
- The first line of each test contains four integers *a,b,k.*

Output format

Print the k^{th} digit for each test.

Ex:

Sample Input	**Sample Output**
2	2 7
3 5 9	
2 7 10	

Question 2 (20 marks)

You are given *N* cities and the i^{th} city contains *a[i]* blocks. If you want to build a road between i^{th} and j^{th} cities *(i≠j),* then the number of blocks needed is *gcd(a[i],a[j]).* Here *gcd* is the greatest common divisor. You have to build roads in such a way that any person can go from any city to

another city in exactly one way, not more than one way between two cities. You have to maximize the total number of blocks used to build roads.

Input format

- The first line contains *N* denoting the number of cities.
- The second line contains *N* integers, *a[1],a[2],...,a[N]* where *a[i]* is the number of blocks in the i^{th} city.

Output format

Print a maximum number of blocks used to build roads in such a way the provided condition is satisfied.

Ex:

Sample Input	**Sample Output**
3	5
4 6 9	