

CS1000 Computer Programming Assignment 7

1. This problem seeks the coefficients resulting from the expansion of the polynomial

$$P = (x_1 + x_2 + \dots + x_k)^n$$

Input

The input will consist of a set of pairs of lines. The first line of the pair consists of two integers n and k separated with space ($0 < k, n < 13$). These integers define the power of the polynomial and the number of variables. The second line in each pair consists of k non-negative integers n_1, n_2, \dots, n_k , where $n_1 + n_2 + \dots + n_k = n$.

Output

For each input pair of lines the output line should consist of one integer, the coefficient of the monomial $x_1^{n_1} x_2^{n_2} \dots x_k^{n_k}$ in the expansion $(x_1 + x_2 + \dots + x_k)^n$.

Sample Input

```
2 2
1 1
2 12
1 0 0 0 0 0 0 0 0 0 1 0
```

Sample Output

```
2
2
```

2. Given a set of parenthesis (,) - write a program to output the largest matching subset of parenthesis.

Input

```
((()((
(((()))
()((()()(
((
```

Output

```
()
((((()
()
empty
```

3. Waring's prime number conjecture states that every odd integer is either prime or the sum of three primes. Goldbach's conjecture is that every even integer is the sum of two primes. Both problems have been open for over 200 years.

In this problem you have slightly less demanding task. Find a way to express a given integer as the sum of exactly four primes.

Input

Each input case consists of one integer n ($n < 1000000$) on its own line. Input is terminated by end of file.

Output

For each input case n , print one line of output containing four primes which sum up to n . If the number cannot be expressed as a summation of four prime numbers print the line "impossible" in a single line. There can be multiple solutions. Any good solution will be accepted.

Sample Input

```
24
36
46
```

Sample Output

```
3 11 3 7
3 7 13 13
11 11 17 7
```

4. You are given a function that only sorts the even positions of an array. For example, given A[10], the function sort_even sets the array elements A[0], A[2], A[4], A[6], A[8] in sorted order. Write a program to use this function to sort a given complete array.

Input

Array of n-elements

Output

Sorted array

5. Given a set of n city names, output them in a sorted order. Each city can have maximum 30 characters.

Input

```
4
Navi Mumbai
New Delhi
Mumbai
New York
```

Output

```
Mumbai
Navi Mumbai
New Delhi
New York
```

6. Given a sorted array of not necessarily distinct 100000 integers. Write a program to find indices of all array elements that have a given value v, or state it does not exist. For example, if number 100 occurs in indices 2456, 2457, 2458 of array, number 103 in 2465, and number 108 does not occur. The program should output 2456-2458 for 100, 2465 for 103, and 'does not occur' for 108.

7. Remove nested comments from a C-program. A comment starts with /* and ends with */. Read input from "testInput.c" and print the comment-removed program in "testOutput.c". Print "Error Message" if there are extra begin or end of comments.

8. Write functions mysine(x), mycos(x), mytan(x) which compute sine, cos and tan values of x given in degrees without using math.h functions. Your numerical answers should be correct for at least four decimal places. The input contains the value of x in radians and the output should contain the values returned by mysine, mycos and mytan upto four digits of precision printed in one line separated by spaces. The input terminates with 0.

Input	Output
150	0.5000 -0.8660 -0.5774
235	-0.8192 -0.5736 1.4281
0	