Campus 2 career
Company specific training (CTS) - WORKBOOK

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1.Remove Brackets

In a mathematics class, Jason , the mathematics teacher asks the students to solve a workbook of expressions. An expression consists of characters, operators and brackets. But Jason wants to give simplifed expressions to the students by removing the brackets from the expression and forming the updated expression after removing brackets. Write an algorithm to help Jason simplify an expression by removing the brackets from the expression and forming the updated expression after removing brackets.

Sample Input 0
x+(p+q)+(a+b)

Sample Output 0
x+p+q+a+b

Input Format
The input to the function/ method consists of a string exprsn, representing an expression

Output Format
Return a string representing the simpli□ed expression by removing the brackets from the expression and forming the updated expression after
removing brackets in the given expression.

Sample Input Sample Output
(x+y)+((p+q)+(i+j)) x+y+p+q+i+j
Time Limit: - ms Memory Limit: - kb Code Size: - kb

2.Half Ascending Half Descending.

Given an integer array arr of length len, write a program to sort the □rst k (<len) elements of this array in ascending and the remaining (len - k) elements in descending order. The input to the function □ndArrSort shall consist of an array am its length len and It (< len). The function should return a sorted array with its □rst k element(s) sorted in ascending order and the remaining (len-k) elements in descending order. Useful Commands:
• new is used to dynamically allocate memory in C++ The statement –
Int*arr _new = new int[x].
creates an integer array arr new of length x.

Test Case 1:
Input: [7, 43, 12, 4, 1, 3, 78, 6], 8.4
Expected Return Value: [4, 7, 12, 43, 78, 6, 3, 1]

Test Case 2:
Input: [1, 2,3,4, 5, 6, 7, 8, 9, 10], 10,5
Expected Return Value: [1, 2, 3, 4, 5, 10, 9, 8, 7, 6]

Input Format
Input contains the length of the array , no of elements to sort and the array elements

Output Format
Print the array

Constraints
1 <= size <= 1000

Sample Input
10 6
4 7 2 9 1 3 5 6 8 10

Sample Output
1 2 3 4 5 6 10 9 8 7
Time Limit: - ms Memory Limit: - kb Code Size: - kb

3.Matrix multiplication
Transpose the given matrix, multiply it with the given matrix and print the transpose of the result.

Transpose matrix	Given matrix
1 4 7	1 2 3
2 5 8	4 5 6
3 6 9	7 8 9

Multiplication
14 32 50
32 77 122
50 122 194

Input Format
Input contains rowCount,colCount and the array values

Output Format
Print the array values with 4 digits of width

Constraints
1 ≤ array_size ≤ 1000

Sample Input
3 3
1 2 3
4 5 6
7 8 9
Sample Output
14 32 50
32 77 122
50 122 194

4.String Rotation
A Program to check if strings are rotations of each other or not Given a string s1 and a string s2, write a programt to say whether s2 is a rotation of s1?
(eg given s1 = ABCD and s2 = CDAB, return 1, given s1 = ABCD, and s2 = ACBD , return -1)

Input Format
Input contains two strings
Output Format
Print 1 if two string are rotation of each other else -1

Constraints
1<=string_length<=1000

Sample Input
sample
mplase

Sample Output
-1
Time Limit: - ms Memory Limit: - kb Code Size: - kb

5.Prime Factors
Write a 'C' program to ⬜nd out prime factors of given number

Input Format
3 3
1 2 3
4 5 6
7 8 9
Input represents the value n

Output Format
Print the prime factors separated by space

Constraints
1<= num <= 1000000

Sample Input
225
Sample Output
3 3 5 5
Time Limit: - ms Memory Limit: - kb Code Size: - kb

6. Swap Value and index
Given a unique positive integer array of length len with element ranging from 0 to (len -
1),write a program to interchange the element
value and its corresponding index values.
For example : if a[0]=3, a[1]=2,a[2]=0 and a[3]=1
Then output is : a[0]=2, a[1]=3, a[2]=1 and a[3]=0
The input to the function swapArr shall consist of an array arr its length len. The function
should return an array after replacing the
elements with their index values . the values in arr shall always be and cover all numbers
between 0 to (length of array-1)
Useful Commands:
Malloc() is used to dynamically allocate memory in c. The statement-
int*arr_arr=(int*)malloc(len*sizeof(int));
Creates an integer array arr_new of length len

Input Format
Input contains the array size and the values

Output Format
Print the altered array

Constraints
1<=array_size<=1000
Sample Input
9
6 4 2 3 5 0 1 7 8
Sample Output
5 6 2 3 1 4 0 7 8
Time Limit: - ms Memory Limit: - kb Code Size: - kb

7. Program to print the given 2D Array or Matrix in spiral form
Input:
3 6
1 2 3 4 5 6
7 8 9 10 11 12
13 14 15 16 17 18
Output:
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11

Sample Input
3 6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Sample Output
1 2 3 4 5 6 12 18 17 16 15 14 13 7 8 9 10 11

Time Limit: - ms Memory Limit: - kb Code Size: - kb

8. Balanced parenthesis
A sequence of parenthesis is called balanced if it consists of pairs of opening and closing parenthesis (in that order) which is well nested..For example sequence "(())()", "()" and (()(())) are balanced while "(()" and (())(are not.

Write a function to determine if a given string contains balanced sequence of parenthesis. The input to the function **balanced Parenthesis** is a string str. Each character in the string will be "(" or ")". The output is the count of balanced pairs if the
sequence is balance or -1 otherwise For example, if the input sequence is "(()(()))" , the output is 4
Sample Input
(())
Sample Output
2
Sample Input
()(
Sample Output
-1
Time Limit: - ms Memory Limit: - kb Code Size: - kb

9.Merge Sort Using Pointers
Write a program to merge sort using pointers
Input Format
Input contains the size of the array and the values

Output Format
Print the sorted values

Constraints
Array size may vary
Apply merge sort to sort the values

Sample Input
5
78 64 23 6 93

Sample Output
6 23 64 78 93
Time Limit: - ms Memory Limit: - kb Code Size: - kb

10.Armstrong Numbers Below the Intervals
Write a C Program to Display Armstrong Number Between Two Intervals
If there is no elements print No elements

Input Format
Input contains the start and end range

Output Format

Print the values separated by space

Constraints
1 <= start < end <= 1000000

Sample Input Sample Output
100 500
Sample Output
153 370 371 407

Sample Input
10 100
Sample Output
No elements
Time Limit: - ms Memory Limit: - kb Code Size: - kb

11.ThefunctionpatternPrint(intn)supposedtoprintnnumberoflinesinthefollowingpattern
Forn=4thepatternshouldbe:
1
11
1 1 1
1 1 11

Thefunctioncompliessuccessfullybutfailstoreturnthedesiredresultsduetologicalerrors.
Yourtaskistodebugtheprogramtopassallthetest cases
Input Format: Integer **Output Format:** Corresponding pattern

SampleInput
4

SampleOutput

 1
 11
 111
 1111
SampleInput
5

SampleOutput
 1
 11
 111
 1111
 11111
Time Limit: - ms Memory Limit: - kb Code Size: - kb

12.Analyze the code and find out the syntax error without changing the logic.

Input Format
Input consists of 2 integers.

Output Format
Refer sample input and output for formatting specifications.
The first two lines corresponds to the input and the third line corresponds the output.

SampleInput
6
9

SampleOutput
6 is less than 9
Sample Input
100
2
Sample Output
100 is greater than 2

```c
#include<stdio.h>
int main()
{
inta,b; scanf("%d",&a);
scanf("%d",&b);

if(a==b)
{
printf("%d is equal to %d",a,b)
}
else if(a>b)
{
printf("%d is greater than %d",a,b);
}

if(a<b)
{
printf("%d is less than %d",a,b);
}
}
```

13.

In these days kids are introduced to computers at a very early age and in some schools the dictationtestis conducted using computers.The teachers found it a bit difficult to evaluate these tests and they requested the school management to lessen their burden by automating this task.The 12th class students are learning C programming and they took up the task of automating the dictation evaluation.Here is the code for evaluation,but ithas logical/syntax errors.Check the errors and de bug the code.

```c
#include<stdio.h>
#include<string.h>
int main()
{
char a[50],b[50];
scanf("%s",a);
scanf("%s",b);
if(strcpy(a,b)!=0)
{
printf("It is correct");
}
else
{
printf("It is wrong");
}
return 0;
}
```

Input Format
Input consists of a two strings. Assume that the maximum length of the string is 50 and it contains only alphabets.

Output Format
Refer sample input and output for formatting specifications.

Sample Input
hello
hello

SampleOutput
It is correct
SampleInput
Super
Superb

SampleOutput

It is wrong

14.

Input Format

Input consists of a single character.

Output Format

Output consists of a string---"Vowel"/"Consonant"/"Not an alphabet" Refer sample input and output for formatting specifications.

SampleInput

a

SampleOutput

Vowel

SampleInput

Z

SampleOutput

Consonant

```c
#include <stdio.h>
intmain()
{
int number;

//printf("Enteranumber\n");
scanf("%d",&number);
if (number >= 0)
printf("%d is a positive number \n", number);
else
printf("%d is a negative number \n", number);
}
```

15.The code below has syntax errors. Debug the program to print the given pattern.
(Refertosampleoutput)
```c
#include<stdio.h>
int main()
{
inti,j,n;
scanf("%d",&n);
for(i=1;i<=n;i++)
{
for(j=1;j<=i;j++);
{ if(j%2==1)
printf("1 ")
else
```

```
printf("0");
}
printf("\n");
}
return 0;
}
```

Input Format
Input consists of a single integer.
Output Format
Refer sample output. There is a trailing space at the end of each line.
SampleInput
5
SampleOutput

 1
 1 0
 1 0 1
 SampleInput
 4

SampleOutput

 1
 1 0
 1 0 1
Time Limit: - ms Memory Limit: - kb Code Size: - kb

16.Analyze the code below and debug the syntax errors.
Find the factorial of a given number.

```
#include<stdio.h>
int main()
{
longintfact=1,n,i;
scanf("%d",&n);

for(i =1; i<= n; i++)
{
fact = fact * i;
}
printf("%d", fact); return 0;
}
```

Input Format
Positive integer
Output Format

Factorial

SampleInput
5
SampleOutput
120
SampleInput
8
SampleOutput
40320

17.Analyze the following code and debug the syntax errors.
Find the greatest of three numbers.
```
#include<stdio.h>
int main()
{
int num1, num2, num3;
scanf("%d %d %d", &num1,&num2,&num3);
if (num1 > num2) && (num1 > num3)
{
printf("%d", num1);
}
elseif(num2>num3)
{
printf("%d", num2)
}
else
{
printf("%d", num3);
}
return 0;

}
```

Input Format
3 integers
Output Format
Greatest integer
SampleInput
30
20
10
SampleOutput
8

18. Prime Numbers Below the Range

Given a positive integer num, write a program to print all the prime numbers from 2 to num.
A prime number is a number that is divisible only by 1 and the number itself.
The input to the method **primePrint** of class Prime consists of the input number num.Print all the prime numbers from 2 to num,
each separated by a single space. Do not return anything from the method.
Please ensure that the output should only consist of numbers separated by a single space.

For example
num: 11
Output: 235711
Make sure that your class and method are public. Do not accept any input from the console. They shall be passed as arguments to
the method itself.
Useful Commands:
a%b returns the remainder when a is divided by b.
System.out.print() prints the content within the brackets to the screen.

Testcase 1:
Input:
11
Excepted return value
2 3 5 7 11

Testcase 2:
Input
4
Excepted return value
2 3

Input Format
Input contains the value n

Output Format
Print the numbers separated by space

Constraints
1<= n <= 10000007

Sample Input
10
Sample Output
2 3 5 7
Time Limit: - ms Memory Limit: - kb Code Size: - kb

19.Odd Position Sorting
Given 5,1,4,7,9....do alternate sort (odd position sorting) for this..and print 4,5,9

Input Format

Input contains the array size and the values

Output Format
Print the sorted alternate elements

Constraints
1<=size<=1000

Sample Input
10
7 3 1 8 4 9 5 6 2 10
Sample Output
1 2 4 5 7

Sample Input
184
769 756 350 601 522 334 84 301 80 340 575 22 638 223
Sample Output
4 12 18 22 36 47 55 75 77 79 80 84 84 84 104 116 127

20. Water reservation
A Water reservation system constructed in a city has several opening and closing gates If any
opening g closing gates is no closed with corresponding gate the water will leak out of the
system. And there will be a threat of life to the people living in the city . Also, a
closing gate cannot exist without an opening gate. So,the system head checks the design of
the system and he has to be ensure that the people are safe in the city.
Write an algorithm to fnd wheather the people are safe or not.

Input Format
The input to the function/method consists of one argument-
Str , a string representing the sequence of gates of the water reservation system

Output Format
Return an integer representing the number of gates which have closing gates corresponding to
the
opening gates else return an integer -1.

Sample Input
((()())()()

Sample Output
6

21.Encryption
You have to encrypt a non-empty string phrase .the encryption adds a "cyclic shift" to each
letter. The value of this "cyclic shift" is determined by the position of the letter from the end
of its word. The shift value for each letter of a word is its index value (starting

from 0) from the right most character of the word For example, the shift values in "yum feed" are

Yum : m -> 0 , u -> 1 , y -> 2
Feed: d -> 0 , e -> 1 , e -> 2 , f -> 3
Which gives the encryption avm igfd
Here adding the shift with value 0 to letter 'm' gives 'm' + 0 = m , value 1 to 'u' gives 'u'+1 = 'v' , value 2 to 'u' gives 'y' + 2 = a and so on.
Note that upon reaching the end of the alphabet, the shift wraps around to the beginning (i.e, the shift value for 'y' as shown above is 'a')

Input Format
The input to the function / method consists of a string

Output Format
Return the encrypted string

Sample Input
abcde

Sample Output
eeeee

Sample Input
lunch was good and wowwww

Sample Output
pxpdh ybs jqpd cod bszyxw

22. Renovated Houses
In a town , the houses are marked with English alphabets. A committee in the town wants to renovate houses in the town. As the funds are limited so they plan to renovate only the houses marked with vowels. The committee head gives the list of houses to the members and asks them to identify the houses which were not renovated.
Write an algorithm to help the committee members ☐nd the list of houses that were not renovated.

Input
MynameisAnthony

Output
Mynmsnthny

Input Format
The input to the function/method consists of one argument
houses, a string representing the sequence of house markings
Output Format
Return a string representing the list of houses that were not renovated

Constraints
All the house markings are of English alphabets

Sample Input
this is a test string

Sample Output
ths s tst strng

23. Half Reversed Linked List
Reverse the second half of an input linked list. If the input linked list contained odd number of elements , consider the middlemost element too in the second half

Input Format
Input contains the numbers . -1 denotes the end

Output Format
Print the list

Sample Input
5 7 1 4 3 2 -1
Sample Output
5 7 1 2 3 4

Sample Input
8 45 12 67 91 4 2 78 16 26 30 7 1 -1
Sample Output
8 45 12 67 91 4 1 7 30 26 16 78 2

24. Defuse Bomb
During the war, the enemy battalion has planted a bomb in your bunker. Your informer has sent you a message of the enemy which contains a list having N numbers and key(K) . The numbers have to be used to construct a sequence to diffuse the bomb. According to your informer, the logic to extract the sequence from the whole message is to replace each number with the sum of the next k Elements.if the value of k is positive. When the value of K is negative, the number replaced by the sum of previous K numbers. The series of numbers is considered in a cyclic fashion for the last K numbers
Write an algorithm that finds the sequence to defuse the bomb

Input Format
Input to the function consist of three arguments
size , no of elements in the sequence
key , represents the K value
message, represents the sequence

Output Format

Return a list of integers representing the sequence to diffuse the bomb

Constraints
0<= size <= 10^5
-10^6 <= message[i] <= 10^6
0<= i <= size

Sample Input
4 3
4 2 -5 11
Sample Output
8 10 17 1

25.Pattern
Given an integer N. print N lines in the following manner –
If N = 4
the pattern generated would be –

1*2*3*4*17*18*19*20
—5*6*7*14*13*16
-- -----8*9*12*1 3
-----------10*11

The input to the function trapezium Pattern Print shall consist of an integer N (Assume O<=
N <= 100).
Do not return anything from the function. Print the required pattern using count
Each line of the output shall consist of 'numerals'. "' and '-' only There should be no spaces.
Useful Commands: •
count prints the content to the screen.

Input Format
Input contains n

Output Format
Print the pattern

Constraints
1 <= n <= 50

Sample Input
4
Sample Output
1*2*3*4*17*18*19*20
---5*6*7*14*15*16
------8*9*12*13

26. Remove Vowels
Given a string str, write a program to eliminate all the vowels from it. The list of vowels In the English alphabet is : {a,e,i,o,u,A,E,l,0.U} The Input to the function eliminateVowelString shall consist of a string str (containing only English letters) and returns a pointer to a string which does not contain vowels.
Example:
Input ="abcdefghijklmnopqrstuvwxyz" l
0utput="bcdfghjklmnpqrstvwxyz"
Useful Commands:
Strlen() is used to calculate the length of the string. The statement -int len = strlen(str);
Returns the length of the string str

Input Format
Input contains the string

Output Format
print the altered string

Constraints
1<= string_length<=1000

Sample Input
gAztkTJkCcmUVphMtGEDcWMMLSccLPvrMyLKTYYhkCYfZAiTDJKuS

Sample Output
gztkTJkCcmVphMtGDcWMMLSccLPvrMyLKTYYhkCYfZTDJKSfSwnnt

27. Merge Linked Lists Merge two sorted singly linked lists into one sorted list

Input Format
Given two lists , -1 denotes the end

Output Format
Print the list

Sample Input
22 15 6 5 27 1 8 18 42 16 2 -1
28 25 41 12 22 4 38 26 30 24 11 31 -1

Sample Output
1 2 4 5 6 8 11 12 15 16 18 22 22 24 25 26 27 28 30 31

28. Least Recently Used

The Least Recently Used(LRU) cache algorithm exists the element from the cache(when it's full) that was least recently used. After an element is requested from the cache, it should be added to the cache(if not already there) and considered the most recently used element in the cache. Initially, the cache is empty. The input to the function Lru Count Miss shall consist of an integer max_cache_size, an array pages and
its length len. The function should return an integer for the number of cache misses using the LRU cache algorithm. Assume that the array pages always has pages numbered from 1 to 50
int lru Count Miss(int max_cache_size, int *pages,int len)
{/ /write tour code }

Input Format
Input consists of an integer max_cache_size, array length len and an array pages

Output Format
an integer for the number of cache misses using the LRU cache algorithm

Constraints
Should write a function

Sample Input
3 16
7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0

Sample Output
11

29. Letters and Words
Given an array of letters and words. Write a program to find out the number of ways each of the given words can be constructed using the given letters.
None of the arrays are ordered The max length of the elements of the result array was in 10^9. Input contains the number of characters , array of characters , number of words array of words

Output:
an array of integers containing the number of possibilities for each of those words.

Example:
Letters : [a,b,c,d]
Words : ["dad"]
in this example, d can be constructed as follows
a+a+a+a
a+a+b
b+b
b+a+a
a+c
c+a
dd
has 7 possibilities

a has 1 possibility, 'a' itself.
so the total possibilities for 'dad' is '7*1*7' which is equal to 49.

Sample Input
4
abcd
1
Dad

Sample Output
49

30. PATTERN
PROGRAM TO PRINT THE GIVEN NUMBER PATTERN
N=4
1
101
1001
11111

Input Format
Input contains n

Output Format
Print the pattern

Sample Input
5

Sample Output
1
11
101
1001
11111

31. Remove Duplicates
Write a program to remove duplicate elements in an array
Ip: {1,1,1,1,2,2,2,3,3,4,5}
Op: {1,2,3,4,}

Input Format
Input contains array size and values
Output Format
Print the unique elemnts separated by dpace
Constraints

1<=array_size<=1000

Sample Input
10
12 45 10 23 45 10 55 67 6 9

Sample Output
12 45 10 23 55 67 6 9

32. Largest sum
Write a program to find the sum of contiguous sub array within a one-dimensional array of
numbers which has the largest sum.

Input Format
Input contains the size and values

Output Format
Print the sum

Sample Input
8
-2 -3 4 -1 -2 1 5 -3

Sample Output
7

33. Print the values of a binary tree from leaf nodes

Sample Input
1 2 3 4 5 -1

Sample Output
4 5 2 3 1

34.REVERSE THE ORDER OF WORDS
PROGRAM TO REVERSE THE ORDER OF WORDS IN A GIVEN STRING

Input Format
Input contains a string

Output Format
Print the reversed string

Sample Input
This is a test sentence
Sample Output

sentence test a is This

35. Find the ID
There are N soliders standing in a line with ID from 1 to N, in increasing order. They are going to participate in an exercise consisting of Q actions. During the ith action the Major calls two numbers Li and R i. The soldiers at the Li th and Ri th positions interchange their places and then soliders at (Li + 1)th an (Ri- 1)th positions interchange their places and so on till (Li+m)<(Ri-m). Eath of the soliders's ID will be covered in the range [Li , Ri] for at most one action. Write an algorithm to find the ID of the solider at Kth position in the line after all the actions are completed.

Input Format
The input to the function/method consists of four arguments - num , an integer representing the number of soliders(N) actions , an integer representing the number of actions(Q) position, an integer representing the position of the solider whose ID is required to be found after Q actions (K) act , a list of integers where each element of the list consists of a pair representing the position of the intially called soldiers for the action(Li , R)

Output Format
Return an integer representing the ID of the Kth position solider in the line after Q actions

Constraints
$1 <= position <= num < 10\ 5$
$1 <= actions <= 10\ 5$
$1 <= act[i][0] <= act[i][1] <= num$
$0 <= i < actions$

Sample Input
10 2 4
1 5
6 10

Sample Output
2

36. Power Encryption
Bob has to send a secret code S to his boss. He designs a method to encrypt the code using two key values N and M. The formula that he uses to develop the encrypted code is shown below (((SN % 10)M) %1000000007) Write an algorithm to help Bob encrypt the code

Sample Input 0
2 4 3

Sample Output 0
216

Input Format

The input to the function / method consists of threee arguments secretCode, an integer representing the secret code(S) value N, an integer representing the key value N value M , an integer representing the key value M

Output Format
Return an integer representing the code encrypted by Bob

Sample Input
2 4 3
Sample Output
216

37. Sort By Frequency
Design a way to sort of list of positive integers in the descending order according to frequency of elements. The elements with integers with higher frequency come before with lower frequency elements with same frequency come in the same order as they appear the values.

For example
Input :(1,2,2,3,3,3,4,4,5,5,5,5,6,6,6,7,8,9,10)
Output : (5,5,5,5,3,3,3,6,6,6,2,2,4,4,1,7,8,9,10)
Useful Commands:
The length method can help in returning the length of the array arr. Usageint
len - arr.length;
The following command can be used to declare an array of length len.
int resultnew int[len];

Input Format
Input contains the array size and the values

Output Format
Print the altered array

Constraints
1 <= size <= 1000

Sample Input
13
1 1 2 2 2 3 4 4 5 5 5 5 5

Sample Output
5 5 5 5 5 2 2 2 1 1 4 4 3

38. Find and Replace
Find a sub string in a given string and replace it with another string

Input Format

contains the original string , ☐nd_string and the replace_string

Output Format
Print the altered string

Constraints
1<= strLength <=200
1<= ☐ns,replace <= 20

Sample Input
Lazy girl
girl
boy

Sample Output
Lazy boy

39.Emma wants to gift a bouquet to her father on his birthday and asks for help from her mother Rosy. Rosy gives N flower sticks
numbered 1 to N to Emma and tells her to arrange it in the bouquet in a particular order. She asks her to arrange the first K flower
sticks in an order of their increasing length and the remaining sticks in an order of their decreasing length. Write an algorithm to find
the final arrangement of the flower sticks in which Emma gifted the bouquet to her father.

Sample Input 0
837
9 4 3 45 76 1 2

Sample Output 0
4 7 9 76 45 3 2 1

Input Format
The input to the function/ method consist of three arguments num , an integer representing the number of flower sticks(N) random , an integer
representing the number K given by Rosy to Emma sticks, a list of integers representing the length of flower sticks

Output Format
Return a list of integers representing the final pattern of the ☐ower sticks in which Emma gift the bouquet to her father

Constraints
random<num
0<num<10^6

Sample Input
10 7

55 5467 9 1 8734 4674 5 4 56 34

Sample Output

1 5 9 55 4674 5467 8734 56 34 4

40.Mr.Jason has captured your friend and has put a color around his neck.He has locked the collar with a given "locking key" . Now it
can only be opened with an "unlocking key". Your friend has seen the "locking key" but he does not know how to find the "unlocking
key". You can calculate the "unlocking key" if you have the "locking key" because it willbe the smallest(in magnitude) permutation of
the digits of the "locking key" amd will never start with zero
Help your friend write an algorithm that takes the "locking key" as an input and outputs the "unlocking key".

Input Format
The input to the function/method consists of an argument lockingKey , an integer representing the locking key

Output Format
Return an integer representing the "unlockingKey"

Constraints
$-10^{19} <=$ lockingKey $<= 10^{19}$

Sample Input
756
Sample Output
567

Sample Input
7650
Sample Output
5067

41.PROGRAM TO PRINT THE GIVEN NUMBER PATTERN
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25

Sample Input
5
Sample Output
1
2 4

3 6 9
4 8 12 16

42.Pattern
Pattern Printing

Input: n=3
3 3 3
3 1 3
3 2 3

Input: n=4
4 4 4 4
4 4 1 4
4 4 2 4
4 4 3 4.

Input Format
Input contains n

Output Format
Print the pattern

Constraints
1<=n<=50

Sample Input
3
Sample Output
333
313
323

43.Circular Linked List
Write a function to insert an integer into a circular linked _list whose elements are sorted in
ascending order 9smallest to largest).
The input to the function insertSortedList is a pointer start to some node in the circular list
and an integer n between 0 and 100.
Return a pointer to the newly inserted node. The structure to follow for a node of the circular
linked list is_
Struct CNode ;
Typedef struct CNode cnode;
Struct CNode
{
Int value;
Cnode* next;
};
C node* insertSortedList (cnode* start,int n)

```
{
//WRITE YOUR CODE HERE
}//
```

Input Format
Input contains the values . -1 determines the end of the input

Output Format
Print the list

Sample Input
5 4 1 2 3 -1
Sample Output
3 4 5 1 2

44.LightsOn
The Government of SumoLand has launched a special metro train which has N number of compartments of different lengths as per
the needs of the people in SumoLand. The metro has to cross a dark underpass of length L. Due to the scarcity of electricity , it may
be only a few compartments in which the light are initially turned ON and the rest have the lights turned OFF. While the metro passes
through the underpass, there should be light in atleast one of the compartment that is under the underpass at a given point of time.
If not, then some of the lights have to be turned ON in the train. Due to the scarcity of electricity the number of compartments that
have the light turned ON should be minimized
Write an algorithm to calculate the minimum number of compartments in which the light has to be turned ON

Input Format
The input to the function/method consists of four arguments -
numCompart, an integer representing the number of compartments(N).
lenUnderPass, an integer representing the length of the dark underpass(L).
lenComparts, a list of integers representing the length of the metro compartments.
numLightON, a list of integers of 0s and 1s representing the compartments in which the lights are initially turned ON and turned OFF

Output Format
Return an integer representing the minimum number of compartments in which the light is turned ON

Constraints
$1 <= numCompart <= 106$
$1 <= lenUnderPass <= 109$
$1 <= lenComparts[i] <= 109$
$0 <= numLightON[j] <= 1$
$0 <= i < numCompart$

$0 <= j <$ numCompart

Sample Input
7 10
5 3 4 5 9 9 9
1 0 0 0 1 0 0

Sample Output
2

45.Charlie has a magic mirror. The mirror shows right rotated versions of a given word. To generate different right-rotations of a word,
write the word in a circle in clockwise order, then start reading from any given character in clockwise order till you have covered all
the characters. For example: In the word "sample", if we start with 'p, we get the right rotated word as "plesam". There are six such right rotations of
"sample" including itself. he inputs to the function **isSameReflection** consists of two strings, word1 and word2.
The function returns 1 if word1 and word2 are right rotations of the same word and -1 if they are not. Both word1 and word2 will
strictly contain characters between 'a-z' (lower case letters).

Useful commands:
strlen is used to calculate the length of the string. The statement -
int len strlen(str);
returns the length of the string str.

Testcase 1:
Input
abc,cab
Excepted return value:
1

Testcase 2:
Input
ab,aa
Excepted return value
-1

Sample Input
sample plesam

Sample Output
Yes

Sample Input
ab aa

Sample Output
No

46.Pattern
Write a 'C' program to print the pattern.
For n=5
1
3*2
4*5*6
10*9*8*7
11*12*13*14*15

Input Format
Input represent the value n

Output Format
Print the pattern

Constraints
1 <= n <= 100

Sample Input
4
Sample Output
1
3*2
4*5*6
10*9*8*7

Sample Input
46
Sample Output
1
3*2
4*5*6

47.Less than Key element Print and count all the numbers which are less than a given key
element from a given array

Input Format
Imput contains the no of elements , key value and the elements

Output Format
print the count

Constraints
1 ≤ n ≤105
1 ≤ key ≤ 109

Sample Input
10 163
9058 364 986 23 98 123 546 908 675 53

Sample Output
4

48. You are given an initial value as s and dimensions of the increment matrix as m and n.
    An increment matrix is the matrix whose elements are the incremented values of the
initial   value s. N
For example -
if initial value s = 1 and dimesions are: m=3,n=3

Increment Matrix would be:
1 2 3
4 5 6
7 8 9

Multiply the original increment matrix with its transpose.
The input to the method transposeMultMatrix shall consist of
the initial value s and the dimensions of the increment matrix m and n (s, m and n all
should be positive integers).
The method should return a 2-dimesional matrix for the multiplication matrix.

Sample Input
1 3 3
Sample Output
14 32 50
32 77 122
50 122 194

Sample Input
4 3 2
Sample Output
41 59 77
59 85 111
77 111 145

49.Sort and Print Alternate Digits
Write a program to sort numbers in a array and print the numbers with alternate digits. Ip:
{4,2,5,3,7} Op: {2,4,7}

Input Format
Input contains size and values

Output Format
Print the alternate diigits

Constraints
1<=size<=1000

Sample Input
5
4 2 5 3 7

Sample Output
2 4 7

50.Prime Numbers Between Intervals
C Program to Display Prime Numbers between Two Intervals

Input Format
Input contains the start and end range

Output Format
Print the values separated by space

Constraints
1 <= start < end <= 1000000

Sample Input
5 15

Sample Output
5 7 11 13