

1) mirror image of  $m \times n$  matrix, rotate 90 degree.

$$\begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$$

rotate it to 90 degree.

2). Input  
unlocking key = ~~765~~ ~~567~~ ~~765~~ 765

Output

$$\del{765} \quad 6 \quad 5 \quad 7 \quad 6$$

using Permutation .

3. Input :

Size : 4

key : 3

message :  $[4 \ 3 \ 2 \ 1]$

Output :

message :  $[6 \ 7 \ 8 \ 9]$

4) Size = 19 .

arr =  $[1, 2, 2, 3, 3, 3, 4, 4, 5, 5, 5, 5, 6, 6, 6, 7, 8, 9, 10]$

Output =  $[5, 5, 5, 5, 3, 3, 3, 6, 6, 6, 2, 2, 4, 4, 1, 7, 8, 9, 10]$

5). Input : ( ) ( ) | Input : (( )) ()

Output : -1 |

Output : 3

b. Input:  $m \times n$  matrix  
Output:  
 $\begin{matrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{matrix}$  transpose : then multiply by 3  
 $\begin{matrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{matrix}$   
 $\begin{matrix} 3 & 12 & 21 \\ 6 & 15 & 24 \\ 9 & 18 & 27 \end{matrix}$ .

T) I/P :-  $[5, 2, 3, 4, 9]$   
O/P :-

- 1) Sorting of array (Ascending and Descending)
- 2) Input:-  
(C++)  
Output:- 2.
- 3) Input a matrix, take transpose of the matrix & multiply the matrices with the input matrix.
- 4) Encrypt a sentence.
- 5) using matrix transpose, Rotate an image at  $90^\circ$
6. Parantthesis balancing  
print 2 if parenthesis is balanced.  
else -1.  
I/P    ((())() = 2  
       ()              = -1
7. Bots using unlock and lock key. To reverse the number.  
I/P: 188                  O/P: 881  
       I/P: 328                  O/P: 283
8. Array eg: yum   m → 0, u → 1, y → 2
9. Strrev eg: 1, 2, 3, 4, 5 , O/P - 4, 3, 2, 1, 5
10. Array . eg: size = 5                  O/P - {5, 5, 5, 3, 3, 3, ... }  
(descending order)          array = {1, 2, ..., 19}
11. List (colony with active & inactive) eg: {1 0 1 1 1}, O/P: 0 1 0 0 1 0

1. There are 8 neighbours, if they active is 1 and  
inactive is 0. If either active or inactive  
next day is opposite. Input days = [1, 0, 0, 1, 1, 0, 0]  
message [1, 0, 1, 0, 1, 0, 1]

2. ~~W~~ In a war, there is a bomb of size 1  
diffusion thru stories of digit of size 1  
key and message

I/P key = 3  
size = 4  
message = [5, 10, 8, 14]

3. write a program for encrypted  
array

input: abcde exp: e<sup>0</sup>, d<sup>1</sup>, c<sup>2</sup>, b<sup>3</sup>, a<sup>4</sup>  
output: eeeee

4. write a program to sort array in descending  
order according to their frequencies

input 1 2 3 4 1

O/P: 1 1 2 3 4

5) generate an matrix from the given initial value  
and numbers of rows & columns find its transpose  
and multiply both & give the output

input - initial value = 1

rows = 3

columns = 3

6] write a Program for following o/p.

I/P :- 1, 1, 2, 3, 3, 3, 5, 7, 7

O/P :- 3, 3, 3, 1, 1, 7, 7, 2, 5,

1) parenthesis balancing Question:

I/p  $((()))$  O/p = 3.

I/p  $(())$  O/p = return unbalanced

②  $N=4$  I/p  $[8 \ 5 \ 3 \ 2]$  Bomb diffusion  
 Key = 2  
 O/p  $[8 \ 5 \ \downarrow \ 10 \ 13]$

If Key = -2 O/p  $[5 \ 10 \ 13 \ 8]$

③ 8 adjacent cells in a bee colony,  
 a if .

④ word position encryption

you feed

$2 \ 1 \ 0 \ 3 \ 2 \ 1 \ 0$

O/p

$u+0 = Y$

$0+1 = P$

$Y+2 = A$

input size = 19

5. Sorting (ascending to descending)

=  $[5, 5, 5, 3, 3, 3, 22, 1, 1, 1, 7, 8, 9, 10]$   
 arrange in the size

b) matrix rotation

O/P	expected O/P
1 2 3	7 4 1
4 5 6	8 5 2
7 8 9	9 6 3

1) Input:

$$\{4, 4, 4, 5, 5, 5, 3, 3, 3, 2, 2, 2, 1\}$$

$$O/P \{5, 5, 5, 4, 4, 4, 3, 3, 3, 2, 2, 2, 1\}$$

highest frequency to lowest freq. of nos  
& if it has same freq. then same order

2) I/P

$$\begin{bmatrix} 7 & 8 & 6 \\ 5 & 4 & 3 \\ 1 & 2 & 3 \end{bmatrix}$$
 & a flag value

if flag=0 then shift the matrix LEFT

if flag=1 then shift the matrix RIGHT

1) I/P given a ~~array~~ of 8 values (0 or 1) & a number

consider them as neighbours

If both the adjacent side of 1 nos is

00 or 11 then, the value become 0

01 or 10 then, " "

1

(ii)

$$1 \# 1 \rightarrow 101$$

for the end nos 1 side is always 0  
consider the 1st matrix every time

1) The 10<sup>th</sup> digit will be 9<sup>th</sup> digit number which is divided by 4  
Eg:- 10<sup>th</sup> digit =?      10 digit  
9<sup>th</sup> digit = 8      4  
                |  
                2

2) The transpose multiplication of matrix &  $m \times 0 \rightarrow m$ ;  $0+1=1$   
 $S+2 \rightarrow C$

3) Reverse of a String.

Eg:- YUM  $\rightarrow M \rightarrow 0; O \rightarrow 1; Y \rightarrow 2$   
Food  $\rightarrow D \rightarrow 0; O \rightarrow 1; O \rightarrow 2; F \rightarrow 3$

# wipro aptitude Question

1. The Raven find that a bomb bunker is there camp he sent a message "key", "size" and message in code.
2. matrix  $m \times n$  to rotate the photo in 90° degree clockwise direction  
Ans:  $\begin{bmatrix} 1 & 2 \\ 4 & 3 \\ 5 & 6 \end{bmatrix}$

$$= \begin{bmatrix} 1 & 4 & 5 \\ 2 & 3 & 6 \end{bmatrix}$$

7/08/18

1)  $\text{S}^{\circ}\text{RP} = 4$

key = 3

$$\text{message} = [5, 0, 4, -3] \rightarrow [5, 4, -3]$$

Step 1:  $[0, 4, -3] = 1$

$$[5, 4, -3] = 6$$

$$[5, 0, -3] = 2$$

$$[5, 0, 4] = 9$$

$$[1, 6, 2, 9]$$

2) Rotating a mirror through  $90^\circ$  through Pixel value.

A person need to decode a bomb way to decode is you are given with key, message, if  $k$  is positive add the remaining numbers after the number if  $k$  is negative add before numbers.

Example:

Input

$$m = \{4, -6, 3, 12\}$$

$$k = 3$$

$$\text{output} = \{9, 19, 10, 6\}$$

parenthesis

open bracket

no.of open "(" is equal to no.of )".

closed bracket

→ Test Case 11) Given value <sup>input</sup>  $a = 1.$  row = 3 column = 3.

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

and do transpose.

$$\begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$$

Multiply the two matrices.

$$\begin{bmatrix} \quad & \quad & \quad \\ \quad & \quad & \quad \\ \quad & \quad & \quad \end{bmatrix}$$

2) Test case 11

Given  $\Rightarrow$  CC)CC))  
Output = 4.

else if Given C)C  
O/p = -1.

Q) We have to diffuse a bomb using a code with N number and key(K). Create a code such that ...

$$1 \leq \text{size} < 10^{16}$$

$$10^{10} \leq \text{key} < 10^{15}$$

Q) Convert the string (any string) "I hate you" ,  
if it contains vowels to \*  
 $2^{\text{nd}}$  word if its contains  
consonants to # and the  
last word to uppercase.

Q) Check the parenthesis

1. INPUT, Image in Matrix  
rowsize column size flag .

OUTPUT:- If flag = 0  
rotate  $90^\circ$  left to matrix .

If flag = 1 .  
rotate  $90^\circ$  right to matrix .

2) INPUT: [1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5, 6, 7, 8]

OUTPUT [5, 5, 5, 5, 5, 4, 4, 4, 4, 3, 3, 3, 2, 2, 1, 6, 7, 8]

3. In a linked list

INPUT: [55555, 444, 3, 222, 1111].

OUTPUT:- [11111, 55555, 44444, 322, 3].

1) Multiplication of matrix with its transpose

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

2) In a row of 8 houses. If both the neighbouring house are active (or) inactive, then house will be active on next day. write a program to find the active & inactive houses on  $n^{th}$  day

3). Sorting the numbers in ascending order and print the number of terms in it

4). If input is [a b c d e]  
the output out should be [e e e e e]

rotate the flag to  $90^\circ$  left or Right

If 0 the flag rotate Left

If 1 the flag rotate Right

Test Case 1 :

1 2

3 6

4 4

Output :

1 2 4 3 6

# 1. Encryption code.

Input:

yum feed

Output:

yum  $\Rightarrow$  m  $\rightarrow$  0, u  $\rightarrow$  1, y  $\rightarrow$  2.

feed  $\Rightarrow$  d  $\rightarrow$  0, e  $\rightarrow$  1, e  $\rightarrow$  2, f  $\rightarrow$  3.

# 2. Matrix

Input

first value = 1

rows = 3

columns = 3.

Output:

$$\text{Matrix} = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$

$$\text{Transpose Matrix} = \begin{pmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{pmatrix}$$

Result = Matrix  $\times$  Transpose matrix.

- 
- 1) Balanced parenthesis.
  - 2) unlock key
  - 3) Frequency sort Array

## Matrix multiplication:

Q: The matrix can have m rows and n columns. The input value is get from the user.

Ex: Enter the value.

(If value =  $1 \times 3 \times 3$  matrix)

$$\text{matrix} = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}.$$

Q: Also find the transpose of matrix.

$$\text{eg: } T = \begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}.$$

What is the product of  
matrix  $\times$  Transpose.

- 
- 1) There are eight cells in a straight line, each compete with adjacent cell, integer 1 should return a active cell, integer 2 should return inactive cell, write a algorithm to say no. of active cell corresponding to adjacent
  - 2) Mr. Jackson had a locking key on his color, he had unlocked it, write a program to say permutation of unlocking key ~~which should be~~ output which should not start with zero

# ① Transpose and multiplication matrix

int first value =

int row = 3

int columns = 3

Normal matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Transpose matrix

$$\begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$$

multiplication matrix <sup>on two matrix</sup>

$$\begin{bmatrix} & & \\ & & \\ & & \end{bmatrix}$$

) Use string ,

$$(( )) = 2$$

$$(( ) = -1$$

If equally used open and closed brackets  
return the value . or else return '-1'.

2) Write the program by using ascending

for example,

Input  $\rightarrow$  3, 2, 5, 3, 5, 6

Output  $\rightarrow$  3, 3, 5, 5, 6.

1). Parentheses is balanced or not

Input  $\rightarrow$  "(( ))" in string.

I/p  $\rightarrow$  2

~~Input~~  $\rightarrow$  "(( )" in string.

O/p  $\rightarrow$  -1

2) I/p  $\rightarrow$  210

O/p  $\rightarrow$  102

I/p  $\rightarrow$  768

O/p  $\rightarrow$  687

1.) Your friend is locked by a ~~key~~ number lock, unlock him by arranging the numbers from ascending order

Eg: 1) 372. (Input)

237 (Output)

2) 993 (Input)

379 (Output).

2) an string

(() = 2

(() = -1

If equally used open & closed brackets return the value or else return -1

① A state of the cell has 8 houses, in a straight line. If no one is in the house for a day, the value of a house is 0, it means inactive day, if anyone in the house, the value of that house is 1, it means active day. If no people is available in both house, it is inactive for the next day and active for the next day.

, Output for the state and number of houses in the cell.

Expected Output ::

1 0 0 0 1 0

19/18  
1) If first value = 1, rows x column =  $3 \times 3$   
then form a matrix by incrementing ~~over~~ the first value

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

Find the transpose of a matrix

$$\begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \\ 3 & 6 & 9 \end{bmatrix}$$

Multiply with the original matrix.

2)

matrix

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

replace matrix

$$\begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$$

Ans

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

replace matrix

$$\begin{bmatrix} 9 & 8 & 1 \\ 6 & 5 & 4 \\ 3 & 2 & 7 \end{bmatrix}$$

Input  $\rightarrow 3, 4, 5$

output =

$$\begin{array}{ccc} 1 & 2 & \\ 1 & 22 & \underline{\underline{33}} \\ 1 & 222 & 333 \end{array}$$

Decoding a ~~Rotated~~ message from SPB  
input:

N (No. of values)

K (Size of key)

Message (Values in array)

Test case,

Input

5, 2 [1, 2, 3, 4, 5]

Output.

5 7 9 6 3

Input

5, -3 [1, 2, 3, 4, 5]

Output

9, 6 8 10 12

Add ~~a~~ the <sup>No. of</sup> ~~k~~ values from  
the starting of ~~on~~ the given array.  
if ~~its~~, ~~key~~ is -ve, it should  
start from other end

e.g. First value 1  
Next ~~2~~ <sup>2</sup> values = 2 3

Output 5  
array should  
be ~~not~~ cyclic

Paranthosis  
Balancing the parenthesis

( )

input

(( ))

Output

-1

Input

(( ( )) )

Output

-1

- 1) pixels of image (rotate 90°)
  - 2) descending order (sorting)
  - 3) Matrix multiplication & transpose of matrix
- 4) Parenthesis , if "((())") return no. of count else  
if "(((" return -1.
- 5) Search .

D Sort in Ascending Order

Next Case:

Input: 1 2 3 5 6 9 .

1. Arrange the number according to more repeating terms

Imp : 333 22 1 5555 79

Op : 5555 333 22 1 79

i) Rotate ~~image~~<sup>matrix</sup> for  $90^\circ$   
if flag = 0, rotate in left for  $90^\circ$   
if flag = 1, rotate in right for  $90^\circ$

①  $m \times n$  matrix is an image. Value is 0; ~~is 0~~ then  $90^\circ$  rotation of image in left else and If value is 1; then  $90^\circ$  rotation of image in right

②

① sorting the numbers in descending order & arranging  
the same numbers.

Test case

Input. 1 3 5 5 6 9 8 7 5 6 6

Output. ~~1 3 5 5 6 9 6~~

1 1 9 8 7 6 6 6 5 5 5 3 1