ZOHO Placement Paper

Selection Process:

Level I - Written Test
Level II - Online Test
Level III – Advanced Programming Test
Level IV – Technical/HR Interview

FIRST ROUND:

APTITUDE: general quantitative and logical reasoning (mixture of almost all topics).

TECHNICAL: topics ranging from arrays to dynamic memory allocation.

SECOND ROUND:

CODING:

SET 1:

1. Print the word with odd letters as

```
P         M
 R       A
   O   R
     G
  O     R
 R       A
```

```
P          M
```

2. Given a set of numbers like <10, 36, 54,89,12> we want to find sum of weights based on the following conditions

1. 5 if a perfect square
2. 4 if multiple of 4 and divisible by 6
3. 3 if even number

And sort the numbers based on the weight and print it as follows

<10,its_weight>,<36,its weight><89,its weight>

Should display the numbers based on increasing order.

3. Save the string “WELCOMETOZOHOCORPORATION” in a two dimensional array and search for substring like “too” in the two dimensional string both from left to right and from top to bottom.

```
w       e       L       C       O
M       E       T       O       Z
O       H       O       C       O
R       P       O       R       A
T       I       O       n
```

And print the start and ending index as

Start index : <1,2>

End index: <3, 2>

4. Given a 9×9 sudoku we have to evaluate it for its correctness. We have to check both the sub matrix correctness and the whole sudoku correctness.

5. Given a two dimensional array of string like

```
<”luke”, “shaw”>
<”wayne”, “rooney”>
<”rooney”, “ronaldo”>
<”shaw”, “rooney”>
```

Where the first string is “child”, second string is “Father”. And given “ronaldo” we have to find his no of grandchildren Here “ronaldo” has 2 grandchildren. So our output should be 2.

SET 2:

1) Alternate sorting: Given an array of integers, rearrange the array in such a way that the first element is first maximum and second element is first minimum.

```
Eg.) Input  : {1, 2, 3, 4, 5, 6, 7}
     Output : {7, 1, 6, 2, 5, 3, 4}
```

2) Remove unbalanced parentheses in a given expression.

```
Eg.) Input  : ((abc)((de))
     Output : ((abc)(de))

     Input  : (((ab)
```

```
        Output : (ab)
```

3) Form a number system with only 3 and 4. Find the nth number of the number system.
Eg.) The numbers are: 3, 4, 33, 34, 43, 44, 333, 334, 343, 344, 433, 434, 443, 444, 3333, 3334, 3343, 3344, 3433, 3434, 3443, 3444 ….

4) Check whether a given mathematical expression is valid.

```
    Eg.) Input  : (a+b)(a*b)
         Output : Valid

         Input  : (ab)(ab+)
         Output : Invalid

         Input : ((a+b)
         Output : Invalid
```

I don’t remember the 5th question.

SET 3:

1. Write a program to give the following output for the given input

```
Eg 1: Input: a1b10
       Output: abbbbbbbbbb
Eg: 2: Input: b3c6d15
          Output: bbbccccccddddddddddddddd
The number varies from 1 to 99.
```

2. Write a program to sort the elements in odd positions in descending order and elements in ascending order

```
Eg 1: Input: 13,2 4,15,12,10,5
        Output: 13,2,12,10,5,15,4
Eg 2: Input: 1,2,3,4,5,6,7,8,9
        Output: 9,2,7,4,5,6,3,8,1
```

3. Write a program to print the following output for the given input. You can assume the string is of odd length

```
Eg 1: Input: 12345
       Output:
1       5
  2   4
    3
  2  4
1      5
Eg 2: Input: geeksforgeeks
         Output:
g                         s
  e                     k
    e                 e
      k             e
        s         g
          f      r
             o
          f     r
        s         g
```

```
      k             e
    e                 e
  e                     k
g                         s
```

4. Find if a String2 is substring of String1. If it is, return the index of the first occurrence. else return -1.

```
Eg 1:Input:
        String 1: test123string
         String 2: 123
        Output: 4
Eg 2: Input:
        String 1: testing12
        String 2: 1234
        Output: -1
```

5. Given two sorted arrays, merge them such that the elements are not repeated

```
Eg 1: Input:
        Array 1: 2,4,5,6,7,9,10,13
        Array 2: 2,3,4,5,6,7,8,9,11,15
       Output:
       Merged array: 2,3,4,5,6,7,8,9,10,11,13,15
```

6. Using Recursion reverse the string such as

```
Eg 1: Input: one two three
      Output: three two one
Eg 2: Input: I love india
      Output: india love I
```

SET 4:

Level One:

1) To find the odd numbers in between the range.
Input:
2
15
Output:
3,5,7,9,11,13

2) To find the factors of the numbers given in an array and to sort the numbers in descending order according to the factors present in it.
Input:
Given array : 8, 2, 3, 12, 16
Output:
12, 16, 8, 2, 3

3) To output the number in words (0-999)
Input: 234
Output: Two hundred and Thirty Four

4) To find the print the pattern:
Ip: n=5

Op:
1
1 1
2 1
1 2 1 1
1 1 1 2 2 1

5) A man his driving car from home to office with X petrol. There are N number of petrol bunks in the city with only few capacities and each petrol is located in different places For one km one liter will consume. So he fill up petrol in his petrol tank in each petrol bunks. Output the remaining petrol if he has or tell him that he cannot travel if he is out of petrol.
Input:
Petrol in car: 2 Liters
Petrol bunks: A B C
Distance from petrol each petrol bunks: 1, 5, 3
Capacities of each petrol bunk: 6, 4, 2
Output:
Remaining petrol in car is 5 liters

Level two:
1) Print the given pattern:
Input:
N= 3, M=3
Output:
X X X
X 0 X
X X X

Input:
N=4 M=5
Output:
X X X X
X 0 0 X
X 0 0 X
X 0 0 X
X X X X

Input:
N=6 M=7
X X X X X X
X 0 0 0 0 X
X 0 X X 0 X
X 0 X X 0 X
X 0 X X 0 X
X 0 0 0 0 X
X X X X X X

2) To find the number of groups and output the groups:
Explanation: To find the sum of the elements in the groups and that sum should be divisible by input X and the groups should be limited to range with X numbers.
If X is 3, then the group should have only 2 elements and 3 elements from the array whose sum is divisible by 3.
Input:
Array: 3, 9, 7, 4, 6, 8
X: 3
Output:
3, 9
3, 6
9, 6
3, 9, 6
No of groups: 4

Level three:
1) To output the given string for the given input which is an integer.
Input: 1
Output: A
Input: 26
Output: Z
Input : 27
Output: AA
Input: 28:
Output: AB
Input: 1000
Output: ALL

2) Input:
Number of elements in set1: 4
Elements are: 9, 9, 9, 9
Number of elements in set 2: 3
Elements are: 1,1,1
Output:
1, 0, 1, 1, 0
Input:
Number of elements in set1: 11
Elements are: 7,2,3,4,5,3,1,2,7,2,8
Number of elements in set 2: 3
Elements are: 1,2,3
Output: 7,2,3,4,5,3,1,2,8,5,1

SET 5:

Program 1:
Help john to find new friends in social network

Input:
3
Mani 3 ram raj guna
Ram 2 kumar Kishore
Mughil 3 praveen Naveen Ramesh

Output:
Raj guna kumar Kishore praveen Naveen Ramesh

Program 2:
Input:
With the starting and ending time of work given find the minimum no of workers needed

```
Start time              end time
1230                    0130
1200                    0100
1600                    1700
```

Output:
2

Program 3:
Find the union intersection of two list and also find except (remove even elements from list1 and odd elements from list2)
Input

```
List 1: 1,3,4,5,6,8,9
List 2: 1, 5,8,9,2

Union: 1, 3,4,5,6,8,9,2
Intersection: 1,5,8,9
Except: 1, 3, 5,9,8,2
```

Program 4:

```
Rotate the matrix elements
For 3*3 matrix
Input
1       2       3
4       5       6
7       8       9

Output:
4       1       2
7       5       3
8       9       6

For 4*4 matrix
Input:
1       2       3       4
5       6       7       8
9       10      11      12
13      14      15      16

Output:
5       1       2       3
9       10      6       4
13      11      7       8
```

```
14      15      16      12
```

Program 5:
Find the largest possible prime number with given no
Input
5
4691
Output:
9461

SET 6:

Q1. Given dates in day,month, year order sort them.

Q2. Given a string of integers find out all the possible words that can made out of it in continuous order. Eg: 11112

ans: AAAAB
AKAB
AAKB
AAAL etc.

Q3: Find whether a given number is magic number or not. It is something which gives same digits even after cubing it.

Q4: something related to rotating an array.

Q5: Given two numbers and an operation either + or – , perform the operation.
Now remove any zeros if present in the two numbers and perform an operation. See if the result obtained is same or not after removing zero's in the original result.

SET 7:

1. Cyclic number verification
2. Sorting dates
3. write a code to solve given mathematical expression
4. generation of unique number from any random number
5. given a number u need to print all combination of aphabets for that number

SET 8:

1. Spiral printing.
O/P
4444444
4333334
4322234
4321234
4322234
4333334
4444444

2. Sort the array alternately i.e first element should be max value, second min value, third second max, third second min. Eg: arr[] = {1,2,3,4,5,6,7} O/P: {7,1,6,2,5,3,4} Note: no extra space and time complexity should be less;

3. Print all the substring of the given string.

4. Print the numbers which are mismatched from two array. Arr1 = {a b c d e f g h i}
arr2 ={ a b d e e g g i i}, O/P- cd, de, f, g, h, i.

5. Print all possible combinations from the given string.

SET 9:

SET 10:

Question 1: **Given two sorted arrays output a merged array without duplicates.**
Array1: [1, 2, 3, 6, 9]
Array2: [2, 4, 5, 10]
Merged Array: [1, 2, 3, 4, 5, 6, 9, 10]

Question 2: Given a sliding window of size k print the maximum of the numbers under the sliding window.
Example: Consider a sliding window of size k equals 3. Let the array be [3,2,7,6,5,1,2,3,4] the output should print 7 as the first output as first window contains {3,2,7} and second window contains {2,7,6} and so on and the final output is {7,7,7,6,5,3,4}

Question 3: Given a array with n elements print the number of occurrences of that number each number in that array. The order of number doesn't matter. You can reorder the elements.
Example : [2,1,3,2,2,5,8,9,8]
Output:
2-3
1-1
3-1
5-1
8-2
9-1

Question 4: Enter two strings from command line and check whether any substring present in first string that follows the pattern of second sting.. They asked to implement regular expressions for * and backslash without built in functions.

"abcd" "a*cd" answer : yes
"aaaa" "a*" answer : yes
"a*c" "a*c" answer:yes
"adsd" "ad" answer:no

Question 5: They gave a passage and the output should be printing out the number of occurrence of each word and the indices it occurs without using string matching

The passage given was "jana Gana Mana" and so on.. and we have to print number of jana and it's indices.i.e at which position it occurs.

SET 11:

SET 12:

1.Given two numbers a and b both < 200 we have to find the square numbers which lie between a and b(inclusive)

```
eg) i/p a = 20;b = 100;
      o/p 25,36,49,64,81,100
```

2.Alternately sort an unsorted array..

```
eg) i/p {5,2,8,7,4,3,9}
      o/p {9,2,8,3,7,4,5}
```

3. Given an array and a threshold value find the o/p

```
eg) i/p {5,8,10,13,6,2};threshold = 3;
      o/p  count = 17
      explanation:
Number  parts               counts
5                    {3,2}                  2
8                       {3,3,2}               3
10                     {3,3,3,1}             4
13                     {3,3,3,3,1}          5
6                       {3,3}                    2
2                       {2}                       1
```

4.a. Given two binary numbers add the two numbers in binary form without converting them to decimal value.

```
eg) a = 1010 b = 11001
      o/p  100011
  b.The two numbers were given in base n
        eg) a = 123  b = 13  n = 4
              o/p  202
```

5.Write a program to print the below pattern

```
for n = 6
        1       7       12      16      19      21
        2       8       13      17      20
3       9       14      18
4       10      15
5       11
6
```

6.Given bigger NxN matrix and a smaller MxM matrix print TRUE if the smaller matrix can be found in the bigger matrix else print FALSE

7.Given two matrices a and b both of size NxN find if matrix a can be transformed to matrix b by rotating it 90deg , 180deg , 270deg if so print TRUE else print FALSE

8 In addition to the above question you have to check if matrix a can be transformed by mirroring vertically or horizontally to matrix b.

SET 13:

1. You're given an array. Print the elements of the array which are greater than its previous elements in the array.
Input : 2, -3, -4, 5, 9, 7, 8 Output: 2 5 9You should solve this question in O(n) time.

2.You're given an even number n. If n=4, you have to print the following pattern :

44444334

4334

4444

If n=6, then the pattern should be like this :

666666

655556

654456

654456

655556

666666

3.You're given a number n. If write all the numbers from 1 to n in a paper, we have to find the number of characters written on the paper.For example if n=13, the output should be 18 if n = 101, the output should be 195

4.A number is called as binary-decimal if all the digits in the number should be either '1' or '0'. Any number can be written as a sum of binary-decimals. Our task is to find the minimum number of binary-decimals to represent a number.Input : 32Output : 10 11 11

Input : 120

Output : 10 110

5. You're given a string as an input. You have to reverse the string by keeping the punctuation and spaces. You have to modify the source string itself with creating an another string.
Input :A man, in the boat says : I see 1-2-3 in the sky

Output :

y kse, ht ni3 21ee slsy : a sta o-b-e ht nin amA

SET 14:

1) Given a number, convert it into corresponding alphabet.

Input	Output
1	A
26	Z
27	AA

```
676     ZZZ
```

2) Given a Roman numeral, find its corresponding decimal value.

---

3) Write a program to print all permutations of a given string. Note here you need to take all combinations as well, say for the input ABC the output should be as follows:

```
Input: ABC
Output:
A
B C
AB AC BA BC CA CB
ABC ACB BCA BAC CBA CAB
```

4) Write a program to rotate an n*n matrix 90,180,270,360 degree.

---

rotating a matrix 90 degree. For rotating the matrix 180,270,360 degree, u need to call the same method 2,3,4 times based on the input.

---

6) Write a program to convert a number into a mono-digit number.

Conditions:
a) You are allowed to add and subtract the consecutive digits (starting from left).
b) You are allowed to do only one operation on a digit.
c) You cannot perform any operation on a resultant digit of the previous operation.
d) Your code should also find if a given number cannot be converted to a mono digit number.

```
  Input     Output
72581         7(2+5)81
              77(8-1)
              777
3962          cannot create a mono digit number
```

SET 15:

1) Given an array, find the minimum of all the greater numbers for each element in the array.

```
Sample:
Array : {2, 3, 7, 1, 8, 5, 11}

Output:
{2>3, 3>5, 7>8, 1>2, 8>11, 5>7, 11>}
```

2) Find the largest sum contiguous subarray which should not have negative numbers. We have to print the sum and the corresponding array elements which brought up the
sum.

```
Sample:
Array : {2, 7, 5, 1, 3, 2, 9, 7}

Output:
```

```
     Sum : 14
     Elements : 3, 2, 9
```

3) Given a string, we have to reverse the string without changing the position of punctuations and spaces.

```
Sample:   house no : 123@ cbe
Output:    ebc32 1o :  nes@ uoh
```

4) Given a 2D grid of characters, you have to search for all the words in a dictionary by moving only along two directions, either right or down. Print the word if it occurs.

```
Sample :
  a   z  o   l
  n   x  h   o
  v   y   i   v
  o   r   s  e
 Dictionary = {van, zoho, love, are, is}

 Output:
    zoho
    love
    Is
```

5) Given a string, change the order of words in the string (last string should come first). Should use RECURSION

```
Sample:   one two three
Output :  three two one
```

SET 16:

SET 17:

1. Given an odd length word which should be printed from the middle of the word.
The output should be in the following pattern.
Example:

```
Input: PROGRAM
Output:
              G
            GR
          GRA
       GRAM
     GRAMP
   GRAMPR
GRAMPRO
```

2. It is a program to implement Least Recently Used (LRU) concept. Given a key, if it is already existed then it should be marked as recently used otherwise a value should be stored which is given as input and marked as recently used. The capacity is to store only 10 key, value pairs. If the table is full and given a new key; the key, value pair which is not recently used should be deleted which gives feasibility to store the new key, value pair.

3. Given a few pairs of names in the order child, father. The input is a person name and level number. The output should be the number of children in that particular level for the person given.
Example:
Input:
[
{Ram, Syam},
{Akil, Syam},
{Nikil, Ram},
{Subhash, Ram},
{Karthik, Akil}
];

Syam 2

Output: 3 (Syam has Ram and Akil in level 1 and in level 2 he have Nikil, Subhash, Karthik. So the answer is 3).

4. Given an array of positive integers. The output should be the number of occurrences of each number.
Example:
Input: {2, 3, 2, 6, 1, 6, 2}
Output:
1 – 1
2 – 3
3 – 1
6 – 2

SET 18:

1. Adding 2 numbers

GIven 2 huge numbers as seperate digits, store them in array
and process them and calculate the sum of 2 numbers and store
the result in an array and print the sum.

Input:
Number of digits:12
9 2 8 1 3 5 6 7 3 1 1 6
Number of digits:9
7 8 4 6 2 1 9 9 7
Output :
9 2 8 9 2 0 2 9 5 1 1 3

2.Given sorted array check if two numbers sum in it is a given

value
Input
Array = {1 3 4 8 10 } N = 7
output

true

3. Compiuting value of sin (x)
Input x = 30 n = 10
output = 0.5

Hint : The equation sin(x) = x – x^3 / 3! + x^5 / 5! – ….

4. Write function to find multipication of 2 numbers using +
operator You must use minimu possible iterations.

Input: 3 , 4
Output 12

5. Given array find maximum sum of contiguous sub array

{-2 -3 4 -1 -2 1 5 -3}

output 7 elements [4 -1 -2 1 5]

6. Given unsorted array find all combination of the element
for a given sum. Order should be maintained.

Input :
8 3 4 7 9 N=7
Output
{3 4 } {7}

SET 19:

(SOME SETS ARE MISSING. PLEASE ADJUST)

THIRD ROUND:

ADVANCED PROGRAMMING – APPLICATION DEVELOPMENT

1. Railway reservation system.

2. call taxi booking

3. Inventory stock list

4. a dungeon game.

An adventurer, A monster, A trigger, A treasure, Pits these are the components.
The size and location shall be given in run time. Adventurer must reach treasure fast than monster else he dies (Hint: use absolute of distance)

5. Invoice management

6. Tic Tac Toe game

7. Toll Payment

(modules based so better to go with oop such as c++ or java else in c use structures)

FOURTH ROUND:

Technical HR

FIFTH ROUND:

Personal HR