**TCS – Coding 1**

**Q1**

In Sunrise Basket Company, the criteria for salary increase are as follows:

1. The standard yearly increase is 25%.
2. For administrative staff, if they have worked for more than 5 years, they get 5% extra.
3. For technical staff, if they have a master’s degree they get 3% extra, if they have a Ph.D. (doctoral) you get 10% extra.
4. For all employees, if they speak a foreign language, they get another 2% extra.

Write a complete program to get the present salary of an employee, and their new salary.

**Q2**

A parking lot charges Rs.30 as a minimum fee to park a vehicle for up to 3 hours. An additional charge of Rs.5.00 per hour will be added if it exceeds three hours. For 24 hours the parking fees are Rs.80.00.Write a program to define an array and read the vehicle registration number, and hours parked for each customer and calculate the parking charges for ‘n’ customers and display the output.

**Q3**

There was a Mathematics quiz. A matrix have been given to participants, where the task is to find a path with maximum average over all existing paths. Average is computed as total cost divided by the number of cells visited in the path. The given matrix will be Square matrix (N\*N), where each cell is associated with a specific cost. A path is defined as a specific sequence of cells which starts from the top left cell move only right or down and ends on bottom right cell.

Note: A matrix should be a square matrix

**Q4**

Gandhi and Rahul are friends, Rahul invited Gandhi for a programming contest. The question which was asked in the programming contest is to find the size of maximum size subset whose sum is equal to given sum.

For Ex:

Input : set[] = {2, 3, 5, 7, 10, 15},

sum = 10

Output : 3

The largest sized subset with sum 10 is {2, 3, 5}

**Q5**

Write a program to count number of array elements in the range [L,R] which divides all numbers in range [L,R].

**Q6**

Count the number of pairs in integer array whose sum equals given sum (all elements are unique).

**Q7**

Rajeev and Vinod are best friends. Rajeev given a set of n integers, vinod has to divide the set in two subsets of n/2 sizes each such that the difference of the sum of two subsets is as minimum as possible. If n is even, the sizes of two subsets must be strictly n/2 and if n is odd,the size of one subset must be (n-1)/2 and size of other subset must be (n+1)/2.

**Q8**

We are given a row-wise sorted matrix of size r\*c, we need to find the median of the matrix given. It is assumed that r\*c is always odd.

ANSWER :

1)

include<stdio.h>

int main()

{

int ch,p\_s,exp,ch2;

float n\_s;

printf("1.Administrative Staff \n2.technical staff \n3.Speaks foreign language \n4.Others \n");

printf("Enter the choice :\n");

scanf("%d",&ch);

printf("Enter the present salary :\n");

scanf("%d",&p\_s);

n\_s=p\_s+(p\_s\*25)/100;

if(ch==1)

{

printf("Enter the year of experience :\n");

scanf("%d",&exp);

if(exp>5)

n\_s=n\_s+(n\_s\*5)/100;

}

else if(ch==2)

{

printf("1.Master degree \n2.PH.d \n3.Other\n");

printf("Enter the choice :\n");

scanf("%d",&ch2);

if(ch2==1)

n\_s=n\_s+(n\_s\*3)/100;

else if (ch2==2)

n\_s=n\_s+(n\_s\*10)/100;

}

else if(ch==3)

{

n\_s=n\_s+(n\_s\*2)/100;

}

printf("The new salary is : %f",n\_s);

}

3)

#include<stdio.h>

int main()

{

int N,arr[10][10],sum=0,sum1=0,sum2=0,sum3=0,arr1[10],avg,u=0,avg2,avg4,k=0,m,n,x,y;

printf("Matrix dimension :");

scanf("%d",&N);

printf("Enter Matrix Elements :\n");

for(int a=0;a<N;a++)

{

for(int b=0;b<N;b++)

{

scanf("%d",&arr[a][b]);

}

printf("\n");

}

for(int i=0;i<N;i++)

{

for(int j=0;j<N;j++)

{

sum = sum + arr[j][i];

}

avg = sum/3;

arr1[u] = avg;

u++;

avg =0;

sum =0;

}

for(int p=0;p<N;p++)

{

for(int q=0;q<N;q++)

{

sum1 = sum1 + arr[p][q];

}

avg2 = sum1/3;

arr1[u]=avg2;

u++;

sum1=0;

}

printf("Average of all paths is :\n");

while(u!=0)

{

printf("%d ",arr1[k]);

k++;

u--;

}

printf("\n");

for(int e=0;e<N;e++)

{

for(int f=0;f<N-e-1;f++)

{

if(arr1[f]>arr1[f+1])

{

int temp = arr1[f];

arr1[f]=arr1[f+1];

arr1[f+1]=temp;

}

}

}

printf("The Highest element of avg array : %d",arr1[k-1]);

int ravg=arr1[k-1];

for(m=0;m<N;m++)

{

for(n=0;n<N;n++)

{

sum2 = sum2 + arr[n][m];

}

int avg3 = sum2/3;

sum2=0;

if(avg3 == ravg)

{

int o=3;

while(o!=-1)

{

printf("%d ",arr[n-o][m]);

o--;

}

}

}

for(x=0;x<N;x++)

{

for(y=0;y<N;y++)

{

sum3 = sum3 + arr[x][y];

}

int avg4 = sum3/3;

sum3=0;

if(avg4 == ravg)

{

printf("\nThe path is :\n");

int z=3;

while(z!=0)

{

printf("%d ",arr[x][y-z]);

z--;

}

}

}

}

4)

//NOT COMPLETED

#include<stdio.h>

int main()

{

int sum=0,k=0,a=0,n,arr[20],arr2[20][20],i;

printf("Array size :\n");

scanf("%d",&n);

for(int p=0;p<n;p++)

{

printf("%d)",p);

scanf("%d",&arr[p]);

}

for(i=0;i<n;i++)

{

for(int j=0;j<n-i-1;j++)

{

if(arr[j]>arr[j+1])

{

int temp = arr[j];

arr[j]=arr[j+1];

arr[j+1]=temp;

}

}

}

for(int q=0;q<n;q++)

{

sum=sum+arr[q];

if(sum==10)

{

for(int j=a;j<q;j++)

{

for(int t=0;t<=j;t++)

arr2[k][t]=arr[j];

}

k++;

a=q;

sum=0;

}

}

printf("Sorted array :\n");

for(int u=0;u<k+1;u++)

{

for(int v=0;v<u;v++)

{

printf("%d",arr2[u][v]);

}

printf("\n");

}

}

7)

#include<stdio.h>

int main()

{

int i=0,a,m,sum1,sum2,k,diff;

int arr[10]={1,2,3,4,5,6};

while(arr[i]!='\0')

i++;

printf("Array Size : %d",i);

if(i%2==0)

a=i/2;

else

a=(i-1)/2;

m=a;

while(k!=a)

{

sum1=sum1+arr[k];

k++;

}

while(m!=0)

{

sum2=sum2+arr[m];

m++;

}

diff=sum1-sum2;

printf("Diffrence : %d",diff);

}

8)

import numpy as np

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

array=np.array(arr)

x=np.median(array)

print(x)