Course Name: O Level (2nd Sem B2 and B3 Batch) **Subject:** C Language
Topic: Additional Problem on Matrix **Date:** 20-May-2020

What is Identity matrix?

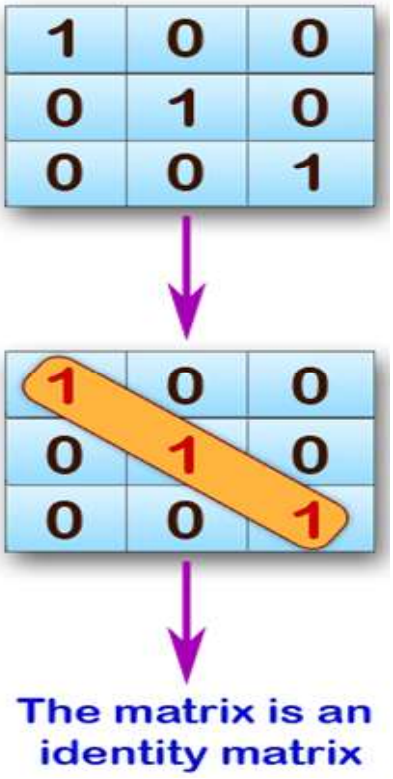
In a square matrix if all the main diagonal elements are 1's and all the remaining elements are 0's is called an Identity Matrix

Example 1: Write a program to check a square matrix of [3 x 3] is identity matrix or not.

```
#include <stdio.h>
#include <conio.h>
void main()
{
int i, j, x[3][3], n =1;
printf("\n\n Check whether a given matrix is an identity matrix :\n ");
printf("Enter the elements of matrix :\n");
for(i=0;i<r1;i++)
for(j=0;j<c1;j++)
{
printf("Element - [%d],[%d] : ",i,j);
scanf("%d",&x[i][j]);
}

printf("The matrix is :\n");
for(i=0;i<r1;i++)
{
for(j=0;j<c1 ;j++)
printf("\t% d",x[i][j]);
printf("\n");
}

for(i=0; i<r1; i++)
for(j=0; j<c1; j++)
{
if(x[i][j]!= 1 && x[j][i]!=0)
{
n = 0;
break;
}
if(n == 1 )
printf("\nThe matrix is an identity matrix.\n\n");
else
printf("\nThe matrix is not an identity matrix.\n\n");
getch();
}
```



Output :

```
 Check whether a given matrix is an identity matrix :
 Enter the elements of matrix :
Element - [0],[0] : 1
Element - [0],[1] : 0
Element - [0],[2] : 0
Element - [1],[0] : 0
Element - [1],[1] : 1
Element - [1],[2] : 0
Element - [2],[0] : 0
Element - [2],[1] : 0
Element - [2],[2] : 1
The matrix is :
        1       0       0
        0       1       0
        0       0       1

The matrix is an identity matrix.
```

What is Magic Square Matrix?

The magic square matrix is a square matrix where each numbers occurring exactly once and the sum of the elements for each row or each column or each diagonal is same.

Example 2: Write a program to check square matrix of [3 x 3] is Magic matrix or not.

```
#include <stdio.h>
#include <conio.h>
void main()
{
int i,j,x[3][3],n=1,r1,r2,r3,c1,c2,c3,d,ad;
clrscr();
r1=r2=r3=c1=c2=c3=d=ad=0;
printf("\nCheck whether a given matrix is Magic Matrix or Not:\n ");
printf("Enter the elements of matrix :\n");
for(i=0;i<3;i++)
for(j=0;j<3;j++)
scanf("%d",&x[i][j]);

printf("The matrix is :\n");
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
printf("\t%d",x[i][j]);
printf("\n");
}

for(i=0;i<3;i++)
for(j=0;j<3;j++)
{
if(i==0)
r1+=x[i][j];
if(i==1)
r2+=x[i][j];
if(i==2)
r3+=x[i][j];
if(j==0)
c1+=x[i][j];
```

Sum of Ist Row

Sum of IInd Row

Sum of IIIrd Row

Sum of Ist Column

```
if(j==1)
c2+=x[i][j];
if(j==2)
c3+=x[i][j];
if(i==j)
d+=x[i][j];
if(i+j==2)
ad+=x[i][j];
}
if(r1==r2&&r2==r3&&r3==c1&&c1==c2&&c2==c3&&c3==d&&d==ad)
printf("\nThe matrix is Magic matrix.\n\n");
else
printf("\nThe matrix is not Magic matrix.\n\n");
getch();
}
```

Sum of II[nd] Column

Sum of III[rd] Column

Sum of Main Diagonal

Sum of Anti-Diagonal

Output:

```
Check whether a given matrix is Magic Matrix or Not:

Enter the elements of matrix :
8
1
6
3
5
7
4
9
2
The matrix is :
        8       1       6
        3       5       7
        4       9       2

The matrix is Magic matrix.

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```