```c
/*
* Que.1 : User define matrix and print as it is
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	getch();
}
```

```c
/*
* Que.2 : Search element in 2D user define array matrix
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;
	int search;
	int f = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	printf("Enter a number you want to search : ");
	scanf("%d",&search);

	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			if(search == a[i][j])
			{
				f = 1;
			}
		}
```

```
        }

        if(f == 1)
                printf("number is found !!");
        else
                printf("number is not found !!");

        getch();
}
```

```c
/*
* Que.3 : Print transpose matrix of given 2D user define array matrix
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[20][20];
	int trsp[20][20];
	int rows , cols;
	int i , j;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	printf("Transpose array elements are : \n");
	for(i = 0 ; i < cols ; i++)
	{
		for(j = 0 ; j < rows ; j++)
		{
			trsp[i][j] = a[j][i];
			printf("%d\t",trsp[i][j]);
		}
		printf("\n");
	}

	getch();
}
```

```c
/*
* Que.4 : Print matrix addition of given 2D user define array matrices
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[20][20];
	int b[20][20];
	int c[20][20];
	int rows1 , cols1;
	int i , j;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows1);

	printf("Enter how many columns you want : ");
	scanf("%d",&cols1);

	printf("Enter 1st array elements : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("1st Array elements are : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	printf("Enter 2nd array elements : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			scanf("%d",&b[i][j]);
		}
	}

	printf("2nd Array elements are : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
```

```
                for(j = 0 ; j < cols1 ; j++)
                {
                        printf("%d\t",b[i][j]);
                }
                printf("\n");
        }

        printf("Addition of 1st and 2nd array : \n");
        for(i = 0 ; i < rows1 ; i++)
        {
                for(j = 0 ; j < cols1 ; j++)
                {
                        c[i][j] = a[i][j]+b[i][j];
                        printf("%d\t",c[i][j]);
                }
                printf("\n");
        }

        getch();
}
```

```c
/*
* Que.5 : Print matrix substraction of given 2D user define array matrices
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[20][20];
	int b[20][20];
	int c[20][20];
	int rows1 , cols1;
	int i , j;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows1);

	printf("Enter how many columns you want : ");
	scanf("%d",&cols1);

	printf("Enter 1st array elements : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("1st Array elements are : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	printf("Enter 2nd array elements : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
		for(j = 0 ; j < cols1 ; j++)
		{
			scanf("%d",&b[i][j]);
		}
	}

	printf("2nd Array elements are : \n");
	for(i = 0 ; i < rows1 ; i++)
	{
```

```
                for(j = 0 ; j < cols1 ; j++)
                {
                        printf("%d\t",b[i][j]);
                }
                printf("\n");
        }

        printf("Substraction of 1st and 2nd array : \n");
        for(i = 0 ; i < rows1 ; i++)
        {
                for(j = 0 ; j < cols1 ; j++)
                {
                        c[i][j] = a[i][j]-b[i][j];
                        printf("%d\t",c[i][j]);
                }
                printf("\n");
        }

        getch();
}
```

```c
/*
* Que.6 : Check given matrix is upper triangular or not
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;
	int cnt = 0;
	int cnt2 = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	if(rows == cols)
	{
		for(i = 0 ; i < rows ; i++)
		{
			for(j = 0 ; j < i ; j++)
			{
				if(a[i][j] == 0)
				{
					cnt++;
				}
				cnt2++;
			}
```

```
                }

                if(cnt == cnt2)
                        printf("given matrix is upper triangular matrix");
                else
                        printf("given matrix is not upper triangular matrix");
        }
        else
                printf("given matrix is not upper triangular matrix");

        getch();
}
```

```c
/*
* Que.7 : Check given matrix is lower triangular or not
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;
	int cnt = 0;
	int cnt2 = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	if(rows == cols)
	{
		for(i = 0 ; i < rows ; i++)
		{
			for(j = i+1 ; j < cols ; j++)
			{
				if(a[i][j] == 0)
				{
					cnt++;
				}
				cnt2++;
			}
```

```
                }

                if(cnt == cnt2)
                        printf("given matrix is lower triangular matrix");
                else
                        printf("given matrix is not lower triangular matrix");
        }
        else
                printf("given matrix is not lower triangular matrix");

        getch();
}
```

```c
/*
* Que.8 : Check given matrix is unit matrix or not
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;
	int chk;
	int cnt = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	chk = rows*cols;

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
			if(a[i][j] == 1)
			{
				cnt++;
			}
		}
		printf("\n");
	}

	if(chk == cnt)
		printf("given matrix is unit matrix");
	else
		printf("given matrix is not unit matrix");
	getch();
}
```

```c
/*
* Que.9 : Check given matrix is identity matrix or not
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[10][10];
	int rows , cols;
	int i , j;
	int chk;
	int min;
	int cnt1 = 0 , cnt2 = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	chk = rows*cols;

	if(rows >= cols)
		min = cols;
	else
		min = rows;

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
			if(i == j  && a[i][j] == 1)
			{
				cnt1++;
			}
			else if(a[i][j] == 0)
			{
				cnt2++;
			}
```

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

        if(chk == cnt1 + cnt2 && min == cnt1)
                printf("given matrix is identity matrix");
        else
                printf("given matrix is not identity matrix");

        getch();
}
```

```c
/*
* Que.10: Check given 2D user define array matrix is symmetric or not
* owner : Shreya Kailas Saskar
* batch : PPA9
*/


// solution :

#include<stdio.h>
#include<conio.h>


void main()
{
	int a[20][20];
	int rows , cols;
	int i , j;
	int cnt = 0;

	printf("Enter how many rows you want : ");
	scanf("%d",&rows);

	printf("Enter how many coloumns you want : ");
	scanf("%d",&cols);

	printf("Enter array elements : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			scanf("%d",&a[i][j]);
		}
	}

	printf("Array elements are : \n");
	for(i = 0 ; i < rows ; i++)
	{
		for(j = 0 ; j < cols ; j++)
		{
			printf("%d\t",a[i][j]);
		}
		printf("\n");
	}

	if(rows == cols)
	{
		for(i = 0 ; i < rows ; i++)
		{
			for(j = 0 ; j < cols ; j++)
			{
				if(a[i][j] == a[j][i] && i != j)
				{
					cnt++;
				}
			}
		}
```

```
        if(cnt == rows * cols - rows)
                printf("given matrix is symmetric matrix");
        else
                printf("given matrix is not symmetric matrix");
        }
        else
                printf("given matrix is not symmetric matrix");

        getch();
}
```