

Finding no of even/odd/zero's column wise:

```
Line 17 Col 15 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int  a[10][10],nr,nc,r,c,e,o,z; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("\t Even\tOdd\tZero");
puts("-----");
for(c=0;c<nc;c++)
{for(e=o=z=r=0;r<nr;r++)
{if(a[r][c]==0)z++; else if(a[r][c]%2==0)e++; else o++;}
printf("%d-col\t %d\t%d\t%d\n",c+1,e,o,z);
}
getch();
}
```

Enter no of rows and columns 3 3
Enter 9 integers
1 2 3
0 1 3
2 0 5

	Even	Odd	Zero
1-col	1	1	1
2-col	1	1	1
3-col	0	3	0

```

for( c=0;c<3;c++)
{
for( e=o=z=r=0; r<3;r++)
{
if(a[r][c]==0)z++;
else if(a[r][c]%2==0)e++;
else o++;
}
p("%d-col\t%d\t%d\t%d\n",c+1,e,o,z);
}

```

r	c	e	o	z
0	1	2	0	0
0	2	0	0	0
1	0	1	1	1
1	1	0	0	0
1	2	1	1	1
2	0	0	0	0
2	1	1	1	1
2	2	1	1	1

4 0,0	7 0,1	0 0,2
9 1,0	0 1,1	2 1,2
1 2,0	4 2,1	7 2,2

1-col e o z
 1 2 0
 2-col 1 1 1
 3-col 1 1 1

Transpose of n*n matrix:

Swap of rows and columns

```
TC
#include<stdio.h> #include<conio.h>
void main()
{int  a[10][10],nr,nc,r,c,e,o,z; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed elements");puts("-----");
for(c=0;c<nc;c++)
{
for(r=0;r<nr;r++)
{
printf("%3d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Enter no of rows and columns 2 3
Enter 6 integers
1 2 3
4 5 6
Transposed elements

1 4
2 5
3 6

```

for(c=0;c<3;c++)
{
for(r=0;r<2;r++)
{
p(a[r][c]);
}
p("\n");
}

```

<u>r</u>	<u>c</u>
0 1 2	0
0 1 2	1
0 1 2	2
	3

4 0,0	7 0,1	0 0,2
9 1,0	0 1,1	2 1,2

4	9
7	0
0	2

Method2:

```
TC
#include<stdio.h> #include<conio.h>
void main()
{int  a[10][10],nr,nc,r,c,e,o,z; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed elements");puts("-----");
for(r=0;r<nc;r++)
{
for(c=0;c<nr;c++)
{
printf("%3d",a[c][r]);
}
printf("\n");
}
getch();
}
```

Enter no of rows and columns 2 3
Enter 6 integers
1 0 9
3 8 1
Transposed elements

1 3
0 8
9 1

```

TC
Enter no of rows and columns 3 3
Enter 9 integers
1 2 3
4 5 6
7 8 9
Transposed elements
-----
1 4 7
2 5 8
3 6 9

```

```

for(r=0;r<3;r++)
{
for(c=0;c<2;c++)
{
p(a[c][r]);
}
p("\n");
}

```

$\frac{c}{0 \ 1 \ 2}$ $\frac{r}{0}$
 $\frac{0 \ 1 \ 2}{0 \ 1 \ 2}$ 1
 $\frac{0 \ 1 \ 2}{2}$ 2
 $\frac{0 \ 1 \ 2}{3}$

4 0,0	7 0,1	0 0,2
9 1,0	0 1,1	2 1,2

4	9
7	0
0	2

Finding trace of n*n matrix:

```
TC
Line 17 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c,s=0; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
if(nr==nc)
{
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)
{scanf("%d",&a[r][c]);if(r==c)s+=a[r][c];}
printf("Trace=%d",s);
}
else printf("Rows and columns should be same");
getch();
}

TC
Enter no of rows and columns 2 3
Rows and columns should be same
```

```

Enter no of rows and columns 3 3
Enter 9 integers
1 0 9
8 1 5
3 7 4
Trace=6

```

Sum of principle diagonal is called trace

```

for(r=0;r<3;r++)
{
    for(c=0;c<3;c++)
    {
        scanf("%d",&a[r][c]);
        if(r==c)s+=a[r][c];
    }
}
p("Trace=%d",s);

```

Handwritten notes for the code above:

<u>r</u>	<u>c</u>	<u>s</u>
0	0 2	0 + 4
1	0 2	+ 0
2	0 2	+ 8
		<u>12</u>

An arrow points from the final value '12' in the handwritten table to the variable 's' in the printf statement of the code.

4 0,0	7 0,1	0 0,2
9 1,0	0 1,1	2 1,2
3 2,0	6 2,1	8 2,2

A red diagonal line is drawn from the top-left cell (0,0) to the bottom-right cell (2,2). The number 12 is written in red below the table.

Finding sum of right diagonal elements:


```
TC
#include<stdio.h>
#include<conio.h>
void main()
{
int  a[10][10],nr,nc,r,c,s=0; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
if(nr==nc)
{
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)
{
scanf("%d",&a[r][c]);if(r+c==nr-1)s+=a[r][c];}
printf("Trace=%d",s);
}
else printf("Rows and columns should be same");
getch();
}

TC
Enter no of rows and columns 3 3
Enter 9 integers
1 2 7
4 2 1
5 8 2
Trace=14
```

if(r+c==nr-1) s+=a[r][c];

$$\frac{nr}{3-1} = 2$$

4 0,0	7 0,1	0 0,2
9 1,0	0 1,1	2 1,2
3 2,0	6 2,1	8 2,2

sum=3

```
TC
#include<stdio.h>
#include<conio.h>
void main()
{
int  a[10][10],nr,nc,r,c,s=0; clrscr();
printf("Enter no of rows and columns "); scanf("%d %d",&nr,&nc);
if(nr==nc)
{
printf("Enter %d integers\n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)
{
scanf("%d",&a[r][c]);if(r+c==nr-1||r==0||r==nr-1)s+=a[r][c];
}
printf("Sum=%d",s);
}
else printf("Rows and columns should be same");
getch();
}

TC
Enter no of rows and columns 3 3
Enter 9 integers
1 2 3
4 5 6
7 8 9
Sum=35
```

if(r==0 || r+c==nr-1 || r==nr-1) s+=a[r][c];

4 0,0	7 0,1	0 0,2
9 1,0	6 1,1	2 1,2
3 2,0	6 2,1	8 2,2

Finding row sum and columns sum:

4 0,0	7 0,1	11 0,2
9 1,0	30 1,1	39 1,2
13 2,0	37 2,1	

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	ag	edu	med	tot
ap	2	1	0.5	X
ts	1.5	2	3	X
mh	4	0.25	1.25	X
tot	X	X	X	

```
#include<stdio.h>
```

```
#include<conio.h>
```

```
void main()
```

```
{
```

```
int a[10][10],nr,nc,r,c,rs,cs; clrscr();
```

```
printf("Enter no of rows and columns ");
```

```
scanf("%d %d",&nr,&nc);
```

```
if(nr==nc)
```

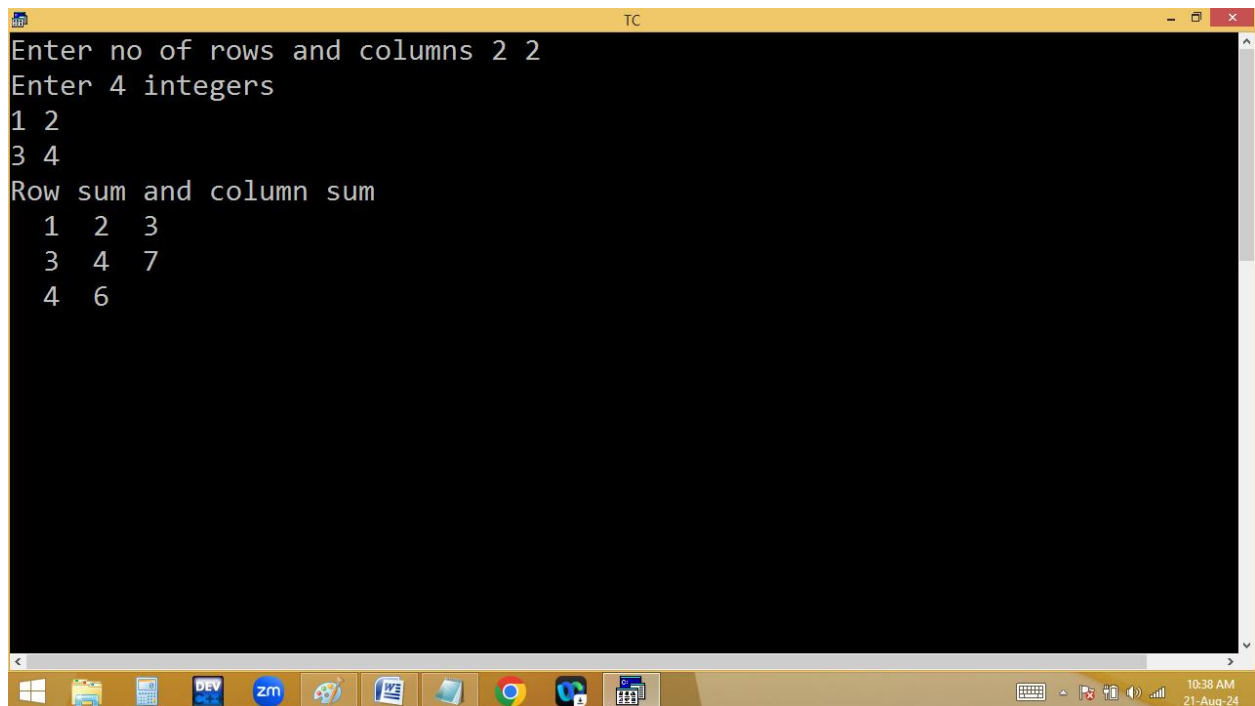
```
{  
printf("Enter %d integers\n", nr*nc);  
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][  
c]);  
for(r=0;r<nr;r++)  
{  
for(rs=cs=c=0;c<nc;c++){rs+=a[r][c];cs+=a[c][r];}  
a[r][c]=rs; a[c][r]=cs;  
}  
printf("Row sum and column sum\n");  
for(r=0;r<=nr;r++)  
{for(c=0;c<=nc;c++)  
{if(r==nr&& c==nc)continue; else  
printf("%3d",a[r][c]);}  
printf("\n");  
}
```

```
}
```

```
else printf("Rows and columns should be same");
```

```
getch();
```

```
}
```



```
Enter no of rows and columns 2 2
Enter 4 integers
1 2
3 4
Row sum and column sum
1 2 3
3 4 7
4 6
```

```
for(r=0;r<2;r++)
{
    for(rs=cs=c=0;c<2;c++)
    {
        rs+=a[r][c];cs+=a[c][r];
    }
    a[r][c]=rs; a[c][r]=cs;
}
```

r	c	rs	cs
0	0	0+4+7=11	0+4+0=4
1	0	0+9+30=39	0+7+30=37
2	0		

4 0,0	7 0,1	11 0,2
9 1,0	30 1,1	39 1,2
13 2,0	37 2,1	2,2

```
#include<stdio.h>
```

```
#include<conio.h>

void main()

{

int  a[10][10],nr,nc,r,c,rs,cs; clrscr();

printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);

if(nr==nc)

{

printf("Enter %d integers\n", nr*nc);

for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);

for(r=0;r<nr;r++)

{

for(rs=cs=c=0;c<nc;c++){rs+=a[r][c];cs+=a[c][r];}

a[r][c]=rs; a[c][r]=cs;

}

}
```



```
printf("Row sum and column sum\n");  
for(r=0;r<=nr;r++)  
{for(c=0;c<=nc;c++)  
{if(!(r==nr&& c==nc))printf("%3d",a[r][c]);}  
printf("\n");  
}  
}  
else printf("Rows and columns should be same");  
getch();  
}
```

```
TC
Enter no of rows and columns 3 3
Enter 9 integers
1 0 2
3 9 7
4 1 7
Row sum and column sum
1 0 2 3
3 9 7 19
4 1 7 12
8 10 16
```