

**Transpose of  $n \times n$  matrix:**

```
TC
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc, r,c; clrscr();
printf("Enter no of rows and columns ");scanf("%d %d",&nr, &nc);
printf("Enter %d elements\n", nr*nc);
for(r=0;r<nr;r++) for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed Elements ");
for(c=0;c<nc;c++)
{
for(r=0;r<nr;r++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Calculator

TC

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

6:24 PM  
31-Jul-24

```

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

```

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2

r	c
0	0
0	1
0	2
1	0
1	1
1	2

9 ✓	5 ✓
4 ✓	7 ✓
1 ✓	3 ✓

**Method2:**

```
TC
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc, r,c; clrscr();
printf("Enter no of rows and columns ");scanf("%d %d",&nr, &nc);
printf("Enter %d elements\n", nr*nc);
for(r=0;r<nr;r++) for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed Elements ");
for(r=0;r<nc;r++)
{
for(c=0;c<nr;c++)
{
printf("%4d",a[c][r]);
}
printf("\n");
}
getch();
}
```

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

TC

```

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

```

c	r
0	0
0	1
0	2

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2

✓ 9	✓ 5
✓ 4	✓ 7
✓ 1	✓ 3

**Finding trace of n\*n matrix:**

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 54 Insert Indent Tab Fill Unindent * E:6PM.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 elements\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("No of rows and columns should be same");
getch();
}
```

```
TC
Enter no of rows and columns 2 3
No of rows and columns should be same_
```

```
TC
Enter no of rows and columns 3 3
Enter 9 elements
1 0 9
2 8 9
3 1 4
Trace=13_
```

`if(r==c)s+=a[r][c];`

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2
8 2,0	2 2,1	10 2,2

Trace=26

**Finding trace of right diagonal elements:**

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 24 Insert Indent Tab Fill Unindent * E:6PM.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 elements\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("Right diagonal Trace=%d",s);
}
else printf("No of rows and columns should be same");
getch();
}
```

```
TC
Enter no of rows and columns 3 3
Enter 9 elements
1 2 0
3 4 5
7 8 9
Right diagonal Trace=11_
```



```
TC
Enter no of rows and columns 2 2
Enter 4 elements
1 3
7 3
Right diagonal Trace=10_
```

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

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2
9 2,0	2 2,1	0 2,2

$$\begin{aligned} r+c &= \overline{3-1} \\ 2 &= \overline{2} \end{aligned}$$

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```
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 elements\n", nr*nc);
for(r=0;r<nr;r++) for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("\t Even \t Odd \t Zero");
puts("-----");
for(r=0;r<nr;r++)
{
for(c=e=o=z=0; c<nc;c++)
{
if(a[r][c]==0)z++; else if(a[r][c]%2==0)e++; else o++;
}
printf("%d-row \t %d \t %d \t %d\n",r+1,e,o,z);
}
getch();
}
```

TC

Enter no of rows and columns 2 5  
Enter 10 elements  
1 2 3 0 0  
4 6 1 5 0

	Even	Odd	Zero
1-row	1	2	2
2-row	2	2	1

TC

### Finding no of even/odd/zero elements row wise

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

1-row 1 2 0  
 2-row 0 3 0  
 3-row 2 0 1

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2
8 2,0	2 2,1	0 2,2

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

```
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 elements\n", nr*nc);
for(r=0;r<nr;r++) for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("\t Even \t Odd \t Zero");
puts("-----");
for(r=0;r<nc;r++)
{
for(e=o=z=c=0; c<nr;c++)
{
if(a[c][r]==0)z++; else if(a[c][r]%2==0)e++; else o++;
}
printf("%d-col \t %d \t %d \t %d\n",r+1,e,o,z);
}
getch();
}
```

```
TC
Enter no of rows and columns 3 4
Enter 12 elements
1 2 3 4
0 0 0 0
1 3 5 7

      Even      Odd      Zero
-----
1-col  0         2         1
2-col  1         1         1
3-col  0         2         1
4-col  1         1         1
_
```

### Finding no of even/odd/zero elements row wise

```
puts("\t Even\tOdd\tZero");
puts("-----");
for(r=0;r<nc;r++)
{
    for(c=e=o=z=0;c<nr;c++)
    {
        if(a[c][r]%2==0)
        {
            e++;
        }
        else
        {
            o++;
        }
        if(a[c][r]==0) z++;
    }
    p("%d-row\t%d\t%d\t%d\n",r+1,e,o,z);
}
```

1-row 1 2 0  
2-row 0 3 0  
3-row 2 0 1

9 0,0	4 0,1	1 0,2
5 1,0	7 1,1	3 1,2
8 2,0	2 2,1	0 2,2

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

### Finding row and column sum:

9 0,0	4 0,1	13 0,2
5 1,0	7 1,1	12 1,2
14 2,0	11 2,1	2,2

Read n stu's id, name, marks in 6 sub's and find tot, avg and pass / fail as follows.

[illegible]