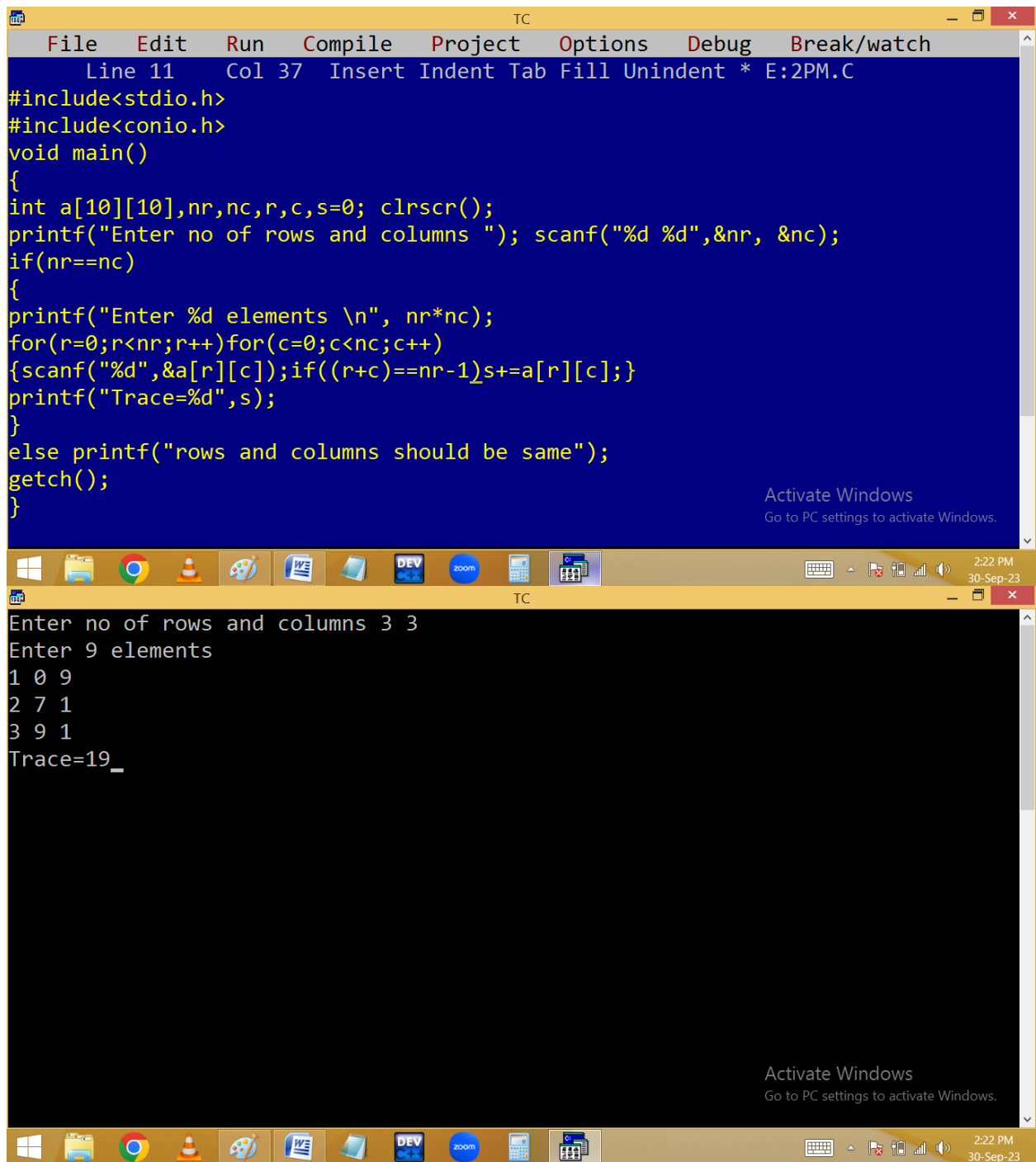


Finding trace of right diagonal elements:

```
if( (r+c)==n-1) s+=a[r][c];  
0+2==3-1
```

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

16



```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 37 Insert Indent Tab Fill Unindent * E:2PM.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("Trace=%d",s);
}
else printf("rows and columns should be same");
getch();
}
```

Activate Windows
Go to PC settings to activate Windows.

2:22 PM
30-Sep-23

```
TC
Enter no of rows and columns 3 3
Enter 9 elements
1 0 9
2 7 1
3 9 1
Trace=19_
```

Activate Windows
Go to PC settings to activate Windows.

2:22 PM
30-Sep-23

Finding row and column sum.

```
#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 elements \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("Elements\n");

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

{

for(c=0;c<=nc;c++)

if(r==nr&& c==nc); else printf("%4d",a[r][c]); printf("\n");

}

}

else printf("No of rows and columns should be equal");
```

```
getch();
```

```
}
```

The image shows two terminal windows on a Windows 10 desktop. The top window, titled 'TC', displays the output of a C program. It prompts the user to enter the number of rows and columns (2 2) and the number of elements (4). It then prints a 3x2 matrix of numbers: 1 2 3, 3 4 7, and 4 6. The bottom window, also titled 'TC', displays the output of a similar C program. It prompts the user to enter the number of rows and columns (2 3) and then prints the message 'No of rows and columns should be equal'. Both windows have a taskbar at the bottom showing various application icons and the system clock indicating 2:45 PM on 30-Sep-23.

```
Enter no of rows and columns 2 2
Enter 4 elements
1 2
3 4
Elements
  1  2  3
  3  4  7
  4  6

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

```

TC
Enter no of rows and columns
3 3
Enter 9 elements
3 9 0
1 2 4
3 1 7
Elements
3 9 0 12
1 2 4 7
3 1 7 11
7 12 11

```

Activate Windows
Go to PC settings to activate Windows.

2:46 PM
30-Sep-23

```

for(r=0;r<2;r++)
{
    for(rs=cs=c=0;c<2;c++)
    {
        s("%d",&a[r][c]);
        rs+=a[r][c]; cs+=a[c][r];
    }
    a[r][c]=rs; a[c][r]=cs;
}

```

$\frac{r}{0}$ $\frac{c}{0,1,2}$ $\frac{rs}{0+1=1}$ $\frac{cs}{0+1=1}$
 $1+4=5$ ✓ $1+3=4$
 $0+3=3$ $0+4=4$
 $3+0=3$ $4+0=4$

1 0,0	4 0,1	5 ✓ 0,2
3 1,0	0 1,1	3 1,2
4 ✓ 2,0	4 2,1	2,2

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 1 Insert Indent Tab Fill Unindent * E:2PM.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 elements \n", nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("\tEven \tOdd \tZero");
puts("-----");
for(r=0;r<nr;r++)
{
for(e=o=z=c=0;c<nc;c++)a[r][c]==0?z++: a[r][c]%2==0?e++:o++;
printf("%d-row\t%d \t%d \t%d\n",r+1,e,o,z);
}
getch();
}
```

Enter no of rows and columns 2 5
Enter 10 elements
1 2 3 4 0
4 -8 0 7 -5

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

```

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

```

1 0,0	4 0,1	5 0,2
3 1,0	0 1,1	4 1,2
4 2,0	2 2,1	1 2,2

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

Arranging 2d elements row wise:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 1 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c,i,j,t; 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]);
for(r=0;r<nr;r++)
{
for(i=0;i<=nc-2;i++)for(j=i+1;j<=nc-1;j++)
if(a[r][i]>a[r][j]){t=a[r][i]; a[r][i]=a[r][j];a[r][j]=t;}}
puts("Sorted elements");
for(r=0;r<nr;r++){for(c=0;c<nc;c++)printf("%4d",a[r][c]);printf("\n");}
getch();
}
Activate Windows
Go to PC settings to activate Windows.

TC
Enter no of rows and columns 3 5
Enter 15 elements
5 9 0 2 -4
1 -5 2 0 3
4 0 4 1 2
Sorted elements
-4  0  2  5  9
-5  0  1  2  3
 0  1  2  4  4
Activate Windows
Go to PC settings to activate Windows.
```


$$\begin{array}{r} \frac{x}{0} \quad \frac{i}{0} \quad \frac{j}{123} \\ \quad \quad 1 \quad \quad 2 \\ \quad \quad \underline{2} \quad \quad \quad \\ 1 \quad 0 \quad 1 \quad \quad 12 \\ 2 \quad \quad \quad \quad 2 \end{array}$$

$\begin{matrix} 5 \\ 0,0 -4 \end{matrix}$	$\begin{matrix} 2 \\ 0,1 \end{matrix}$	$\begin{matrix} 4 \\ 0,2 \end{matrix}$
$\begin{matrix} 3 \\ 1,0 \end{matrix}$	$\begin{matrix} 3 \\ 1,1 \end{matrix}$	$\begin{matrix} 4 \\ 1,2 \end{matrix}$

Column wise:

The image shows two windows of the Turbo C++ (TC) IDE. The top window displays the source code for a program that sorts a 2D array using bubble sort. The bottom window shows the program's execution, where it prompts for the number of rows and columns, then for 15 elements, and finally displays the sorted array.

Top Window (Source Code):

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 9 Col 10 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c,i,j,t; 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]);
for(c=0;c<nc;c++)
{
for(i=0;i<=nr-2;i++)for(j=i+1;j<=nr-1;j++)
if(a[i][c]>a[j][c]){t=a[i][c]; a[i][c]=a[j][c];a[j][c]=t;}}
puts("Sorted elements");
for(r=0;r<nr;r++){for(c=0;c<nc;c++)printf("%4d",a[r][c]);printf("\n");}
getch();
}
```

Bottom Window (Execution):

```
TC
Enter no of rows and columns 5 3
Enter 15 elements
9 4 0
3 -4 7
0 2 5
-4 -6 -1
4 9 1
Sorted elements
-4 -6 -1
0 -4 0
3 2 1
4 4 5
9 9 7
```

Both windows include a Windows taskbar at the bottom with icons for File Explorer, Google Chrome, VLC, Paint, Word, and other applications. The system clock shows 3:46 PM on 30-Sep-23.

```

for( c=0;c<nc;c++)
{
  for(i=0;i<=nr-2;i++)
  {
    for(j=i+1;j<=nr-1;j++)
    {
      if(a[i][c]>a[j][c])

```

```

      i      j      c
      0      2      0
      1      3
      2      3
      0      1      1
      1      2
      0      1      2

```

5 3 0,0 -4	2 0 0,1	4 1 0,2
3 5 1,0 3	0 1 1,1	1,2 1 4
4 5 2,0 5	2 2,1	4 2,2