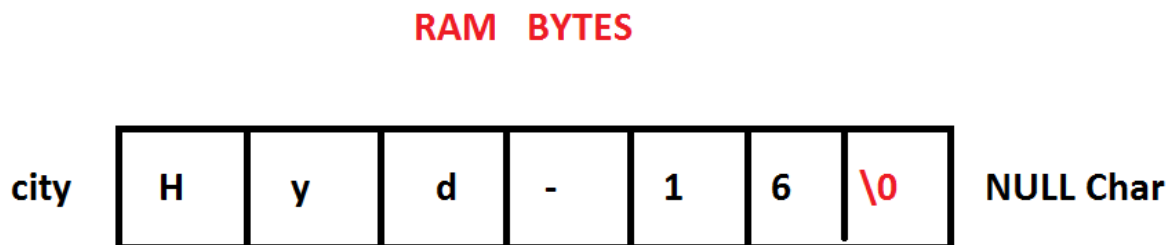


String:

1. A group of characters is called string.
2. It is alpha-numeric. i.e. in a string we can store both alphabets, numbers and special characters.

Eg: `char city[]="Hyd-16";`

3. It is a char array.



Note:

1. One byte should be left for null char. Otherwise we are getting garbage values.
2. String variable size never smaller than string. Otherwise we are getting error.
3. We can't copy a string using = operator. We have to use `strcpy()` available in `<string.h>`
4. We can't compare two strings using == operator. We have to use `strcmp()`.

OPERATORS

Operator is a special symbol designed for a particular task. C comes with 44 operators and 14 separators [, . : ; " ' { },....] Operator works on operands. Based on no of operands participating in operation, the operators divided into 3 types.

1. **Unary operator**: Require one operand.

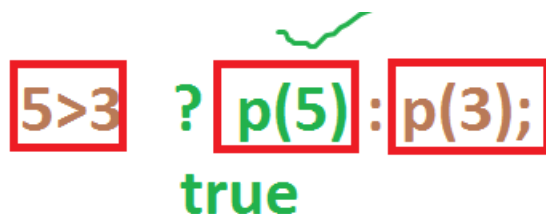
Eg: a++, a--, --a, ++a, sizeof(a), ~a, !a, +a, -a,.....

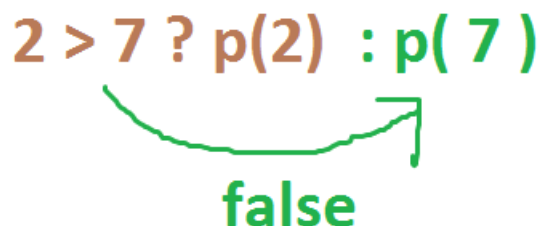
2. **Binary operator**: Require two operands.

Eg: a+b, a-b, a>b, a<=b, a!=b, a<<b, a>>b,....

3. **Ternary operator**: Require three expressions / operands.

Eg: **conditional part** ? **true part** : **false part**;


5 > 3 ? p(5) : p(3);
true


2 > 7 ? p(2) : p(7)
false

Based on operation the operators divided into several types.

1. **Assignment operator [=]**: It copies the value on its right side into the variable on its left side. In assignment operation, the left side operand should be a variable. i.e. expressions not allowed on left side.

Eg:

a=10;

b=1.2;

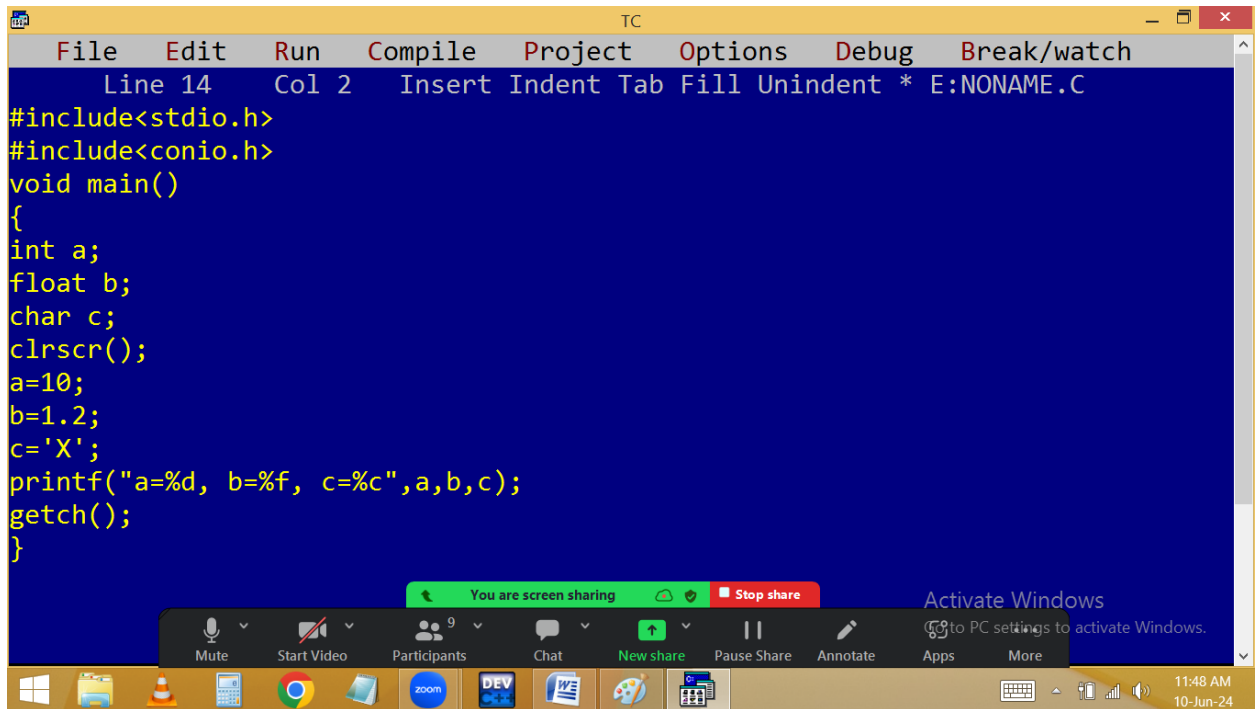
c='X';

d="abc"; ➔ Error ➔ string copy not allowed.

e=f=g=100;

c=10+20;

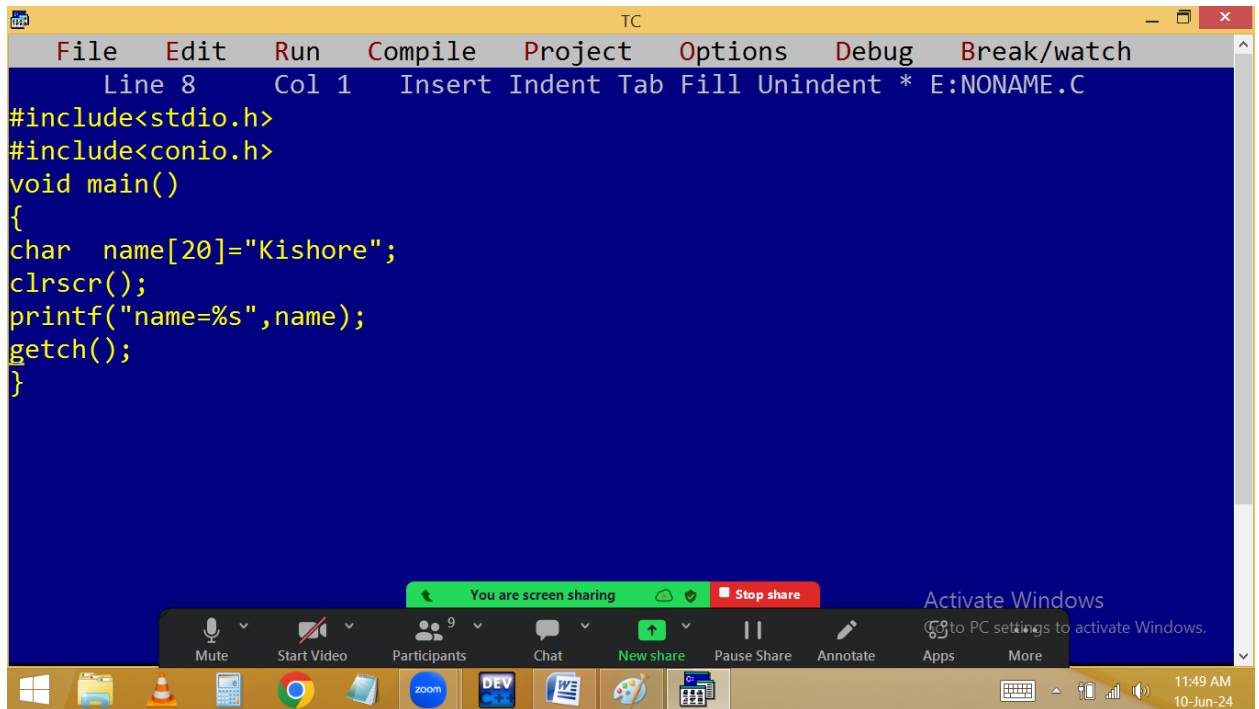
10+20=30; ➔ 30=30 ➔ Error ➔ 30 is constant



```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 2 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
float b;
char c;
clrscr();
a=10;
b=1.2;
c='X';
printf("a=%d, b=%f, c=%c",a,b,c);
getch();
}
```



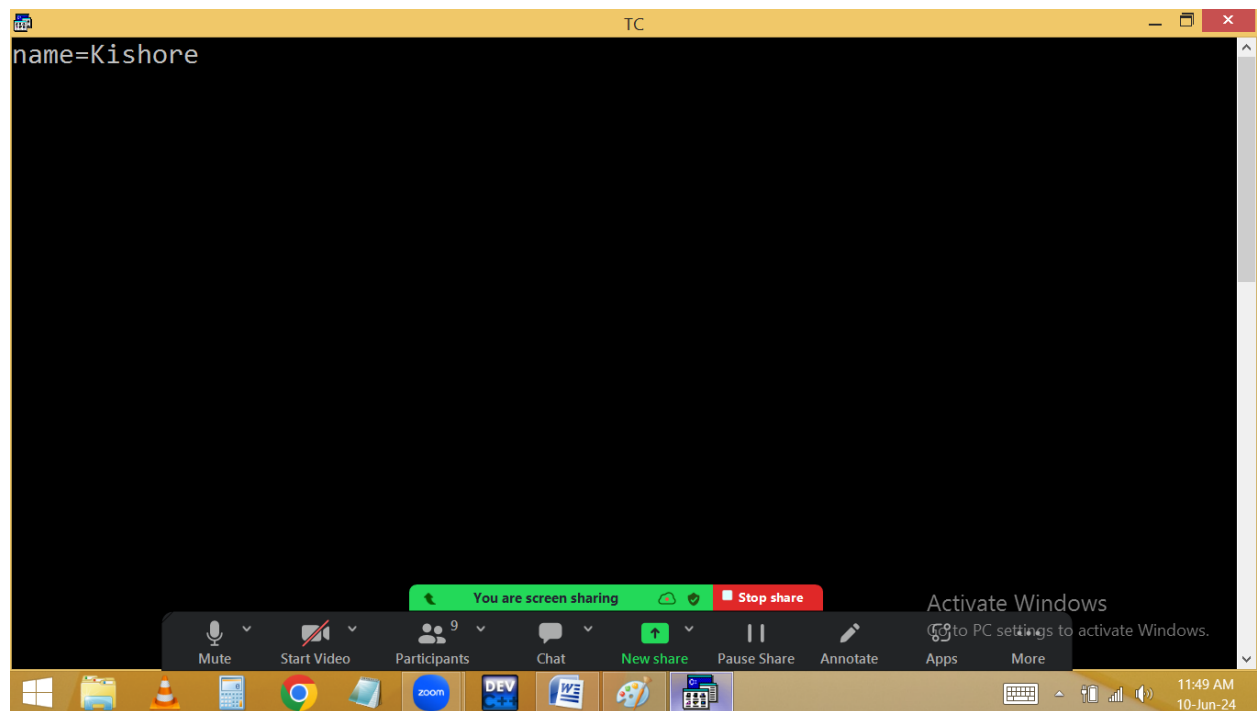
```
TC
a=10, b=1.200000, c=X
```

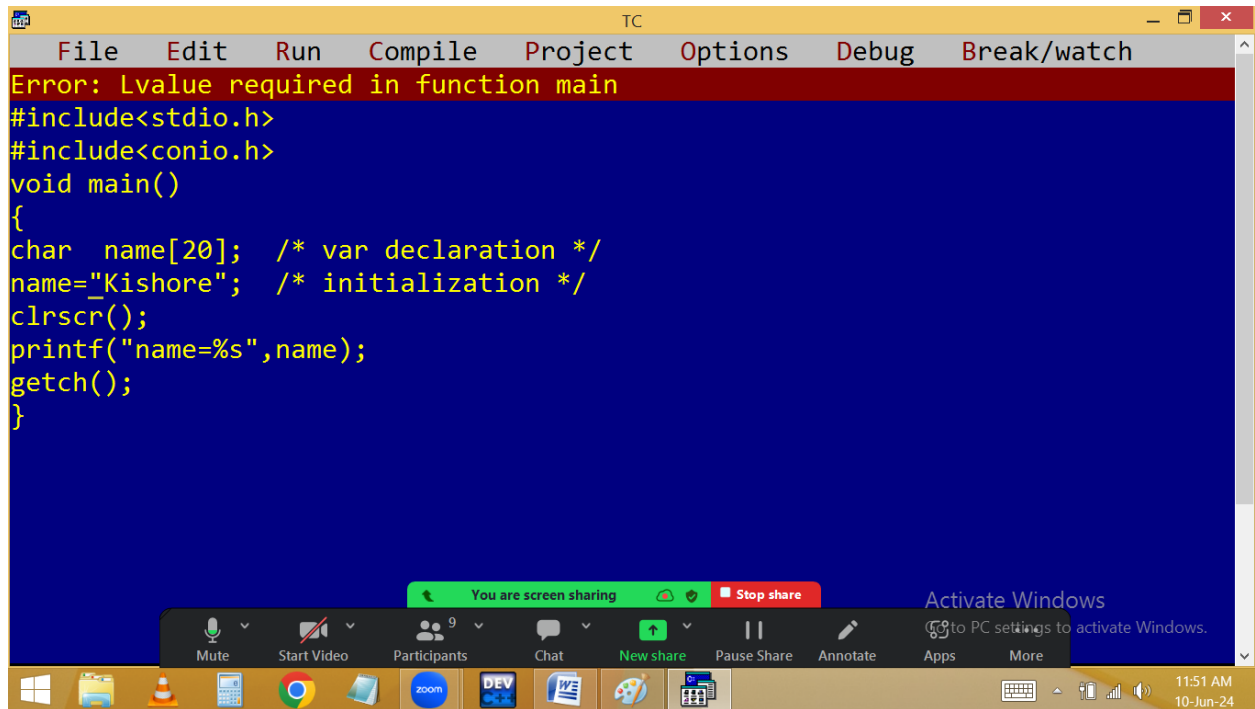


The screenshot shows the Turbo C++ (TC) IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 8 Col 1' and 'Insert Indent Tab Fill Unindent * E:NONAME.C'. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char  name[20]="Kishore";
clrscr();
printf("name=%s",name);
getch();
}
```

Below the code editor, there is a green notification bar that says 'You are screen sharing' with a 'Stop share' button. Below that is a toolbar with icons for Mute, Start Video, Participants (9), Chat, New share, Pause Share, Annotate, Apps, and More. At the bottom is the Windows taskbar with various application icons and a system tray showing the time as 11:49 AM on 10-Jun-24. An 'Activate Windows' watermark is visible on the right side of the screen.

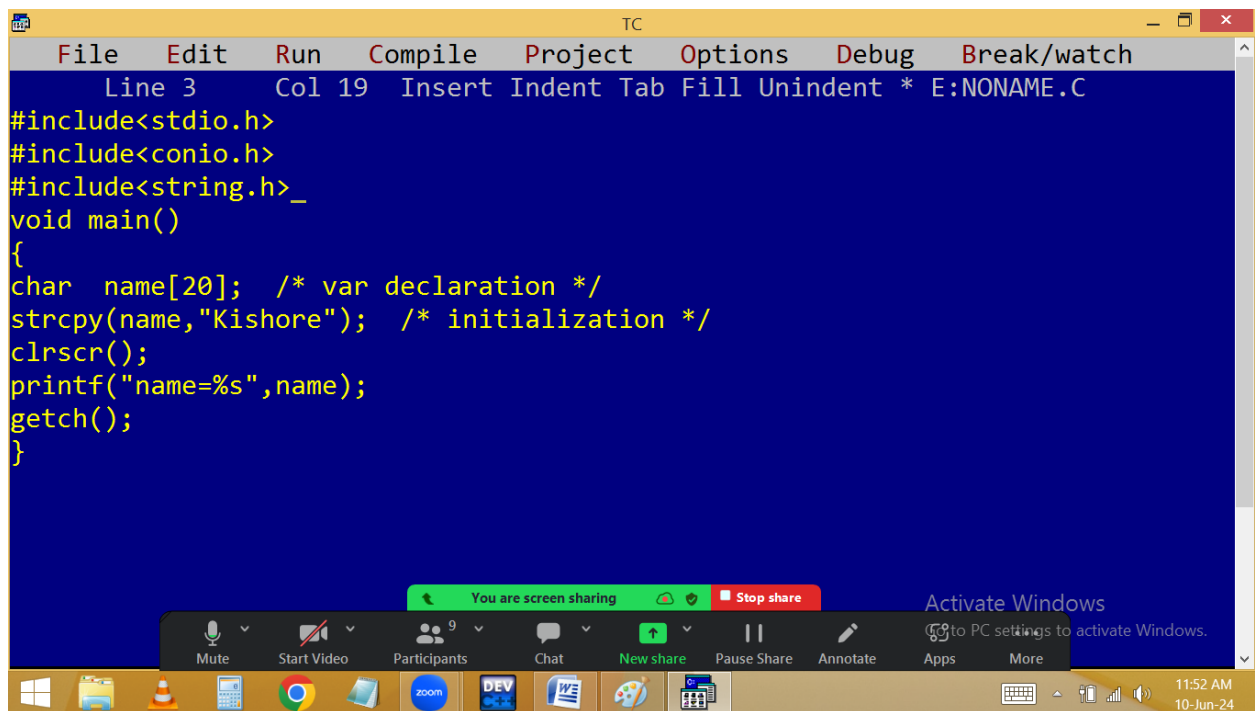




The screenshot shows the Turbo C++ IDE with a compilation error. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message banner at the top reads "Error: Lvalue required in function main". The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char  name[20]; /* var declaration */
name="Kishore"; /* initialization */
clrscr();
printf("name=%s",name);
getch();
}
```

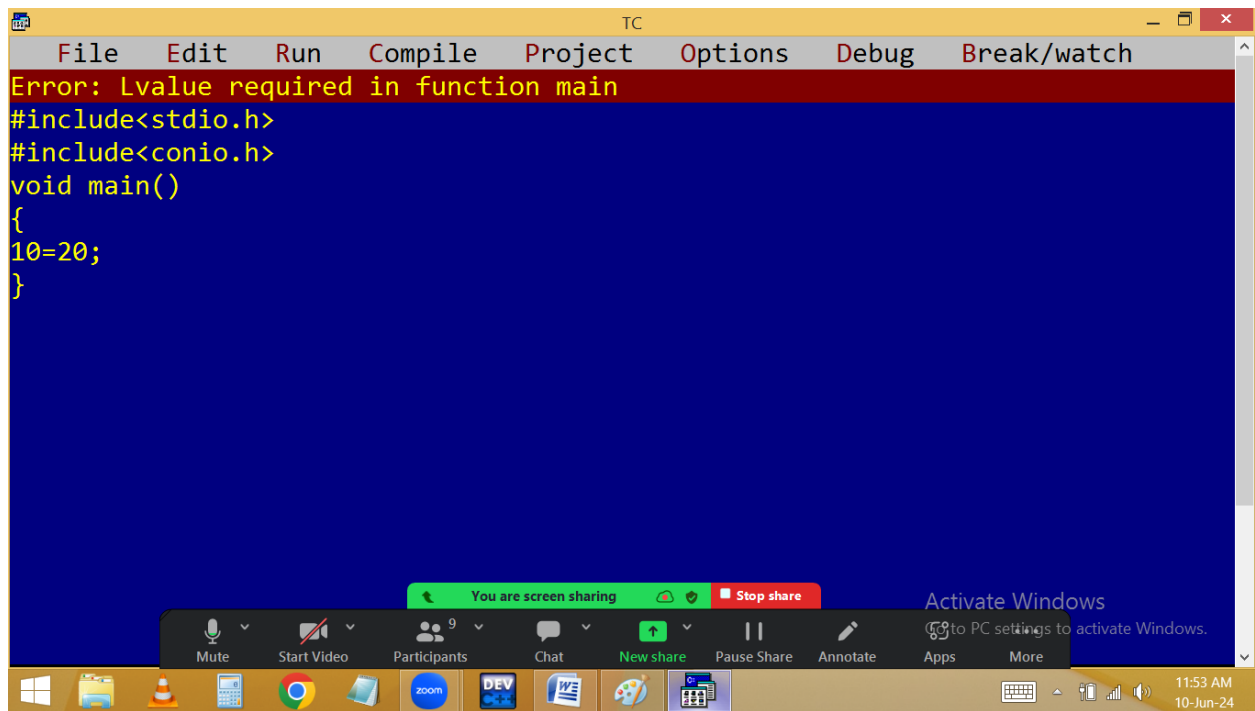
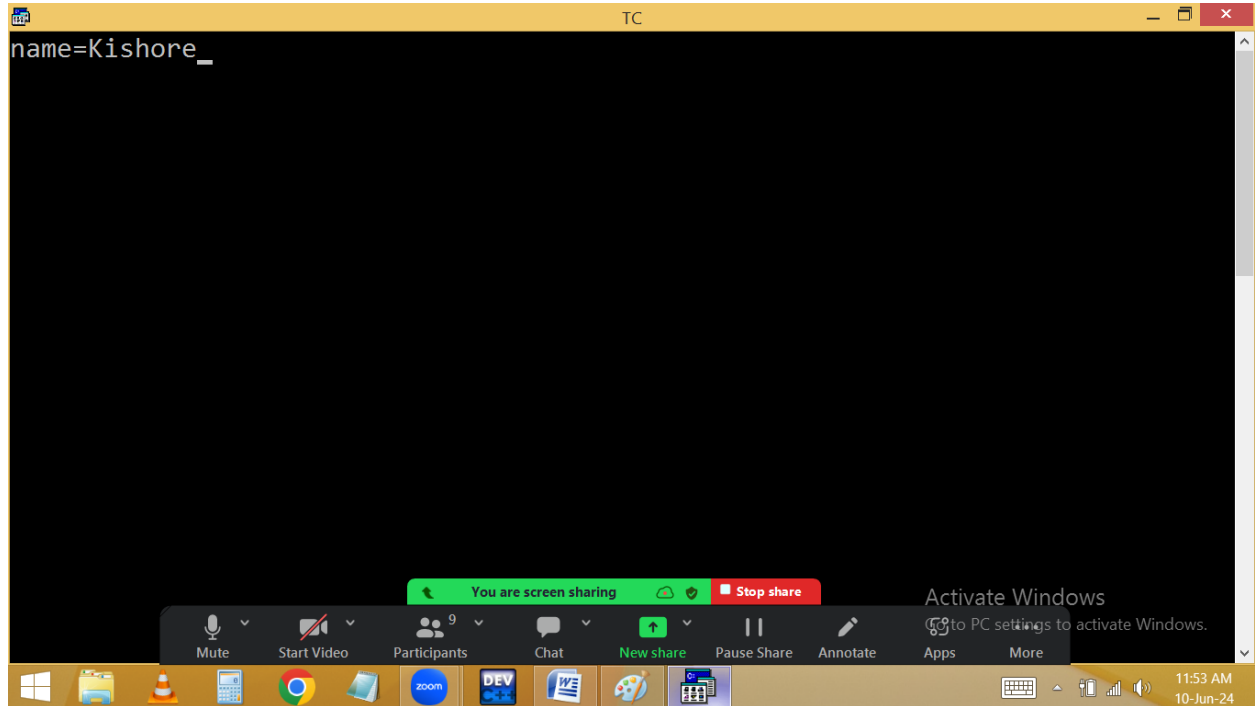
At the bottom, there is a Windows taskbar with various icons and a system tray showing the time as 11:51 AM on 10-Jun-24. A Zoom screen sharing overlay is visible at the bottom of the IDE window.



The screenshot shows the Turbo C++ IDE with the corrected code. The menu bar is the same. A status bar at the top of the editor area shows "Line 3 Col 19 Insert Indent Tab Fill Unindent * E:NONAME.C". The code in the editor is as follows:

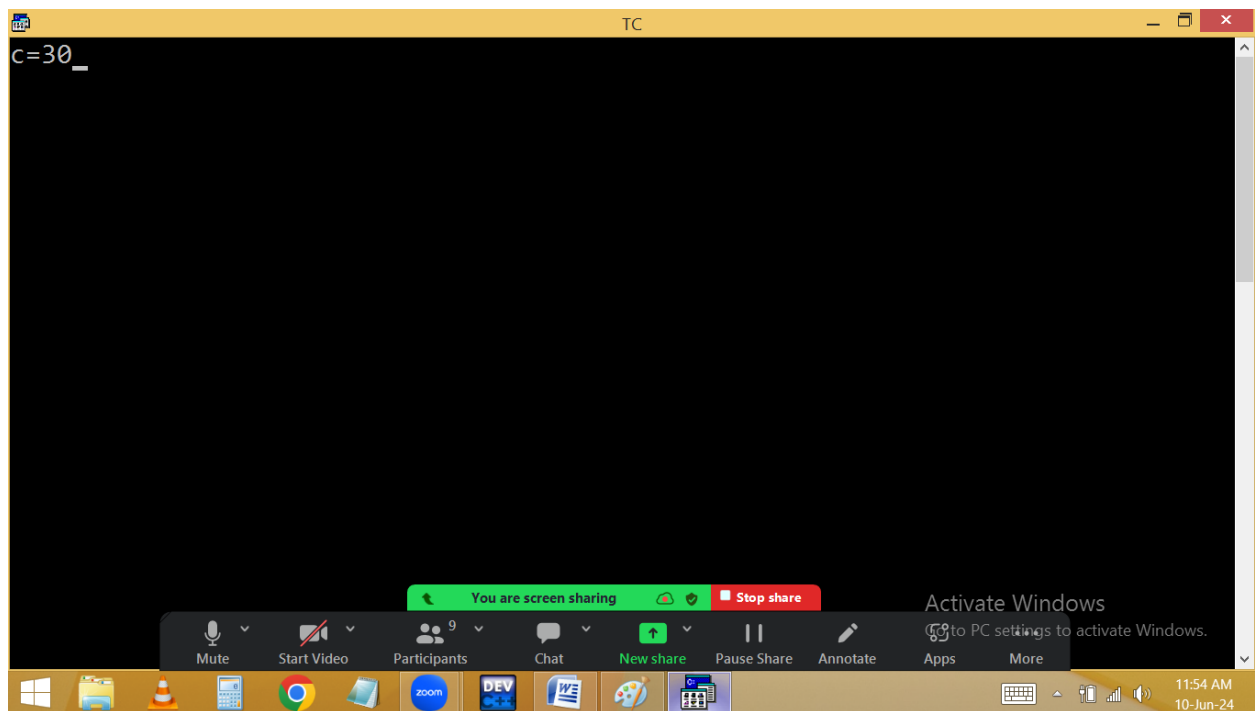
```
#include<stdio.h>
#include<conio.h>
#include<string.h>_
void main()
{
char  name[20]; /* var declaration */
strcpy(name,"Kishore"); /* initialization */
clrscr();
printf("name=%s",name);
getch();
}
```

The bottom of the screen shows the same Windows taskbar and Zoom overlay as the first screenshot, with the time now at 11:52 AM on 10-Jun-24.

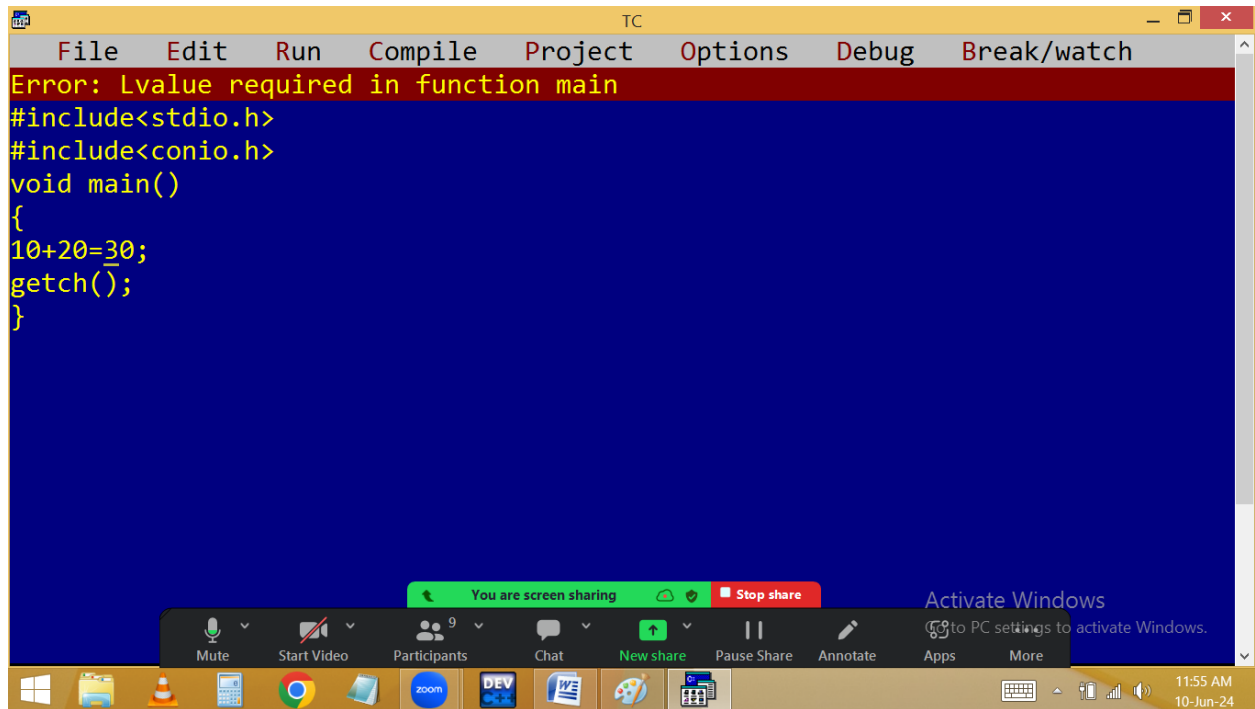




```
File Edit Run Compile Project Options Debug Break/watch
Line 7 Col 10 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
int c;
c=10+20;
clrscr();_
printf("c=%d",c);
getch();
}
```



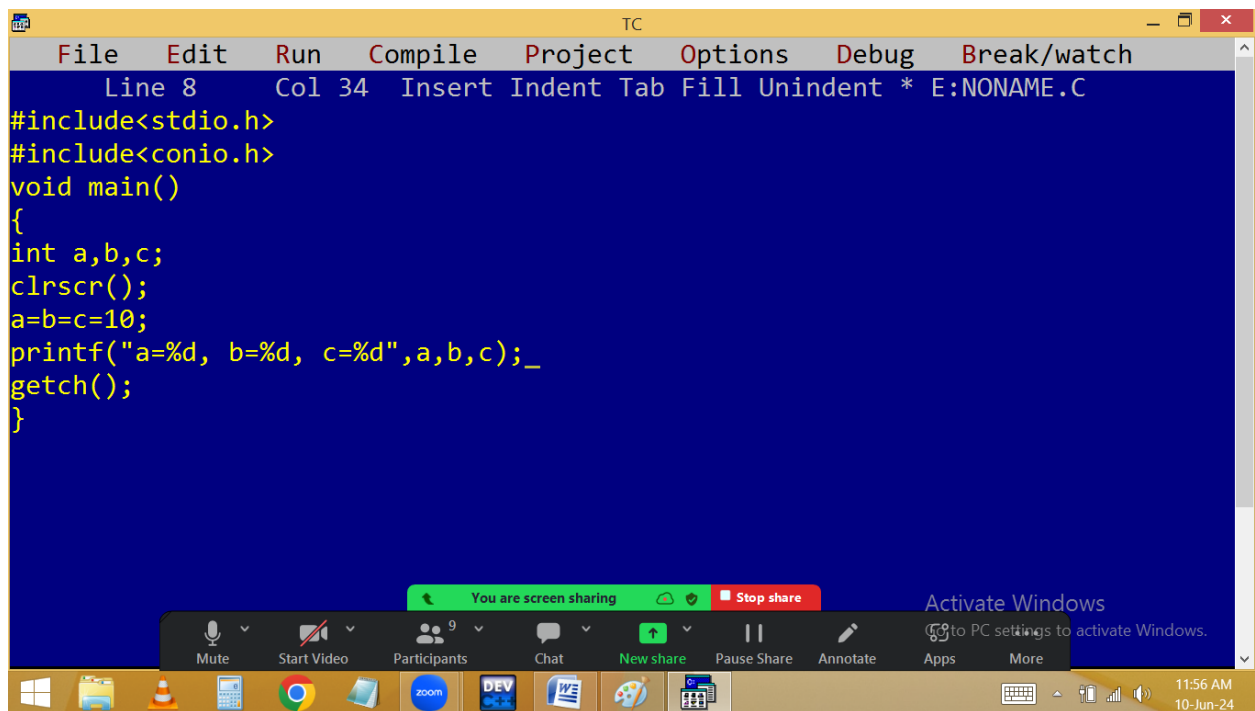
```
c=30_
```

The screenshot shows the Turbo C++ IDE with a menu bar (File, Edit, Run, Compile, Project, Options, Debug, Break/watch) and a dark blue editor area. A red error message banner at the top reads "Error: Lvalue required in function main". The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
10+20=30;
getch();
}
```

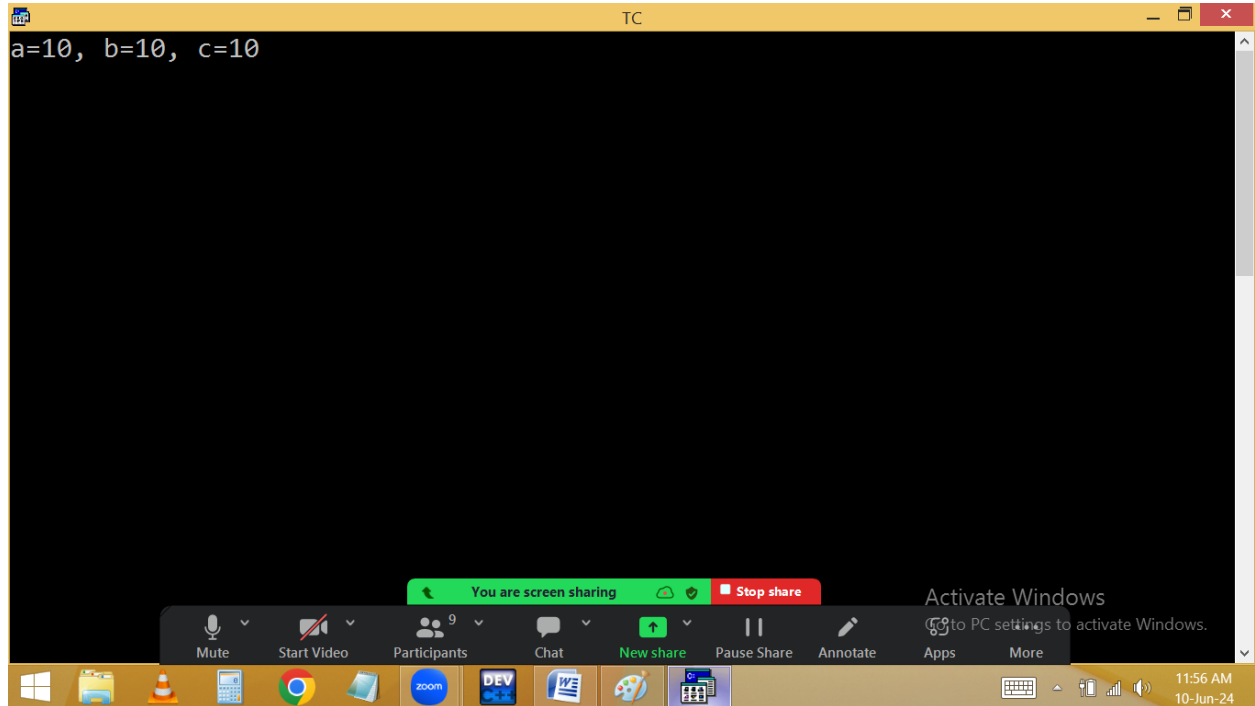
At the bottom, there is a Windows taskbar with various icons and a system tray showing the time as 11:55 AM on 10-Jun-24. A Zoom overlay is visible at the bottom of the IDE window, indicating screen sharing.



The screenshot shows the Turbo C++ IDE with the same menu bar. The editor area now contains a complete C program. The status bar at the top of the editor shows "Line 8 Col 34 Insert Indent Tab Fill Unindent * E:NONAME.C". The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
a=b=c=10;
printf("a=%d, b=%d, c=%d",a,b,c);_
getch();
}
```

The Windows taskbar and Zoom overlay are also visible at the bottom, with the system time now showing 11:56 AM on 10-Jun-24.



2. **Arithmetic operators [+, -, *, %, /]**: They are used to perform mathematical calculations.

Eg: $a+b$, $a-b$, $a*b$,..

% - modules [Remainder]:

$$\begin{array}{r} 5 \overline{) 10} \\ \underline{10} \\ 0 \end{array} \quad \begin{array}{l} 2 \\ \end{array} \quad \begin{array}{l} \Leftarrow \text{Quotient} \Leftarrow / \end{array}$$

% ==> Remainder ==> $\underline{0}$

$$5\%2=1$$

$$\begin{array}{r} 2 \overline{) 5} \\ \underline{4} \\ 1 \end{array}$$

$$2\%5=2$$

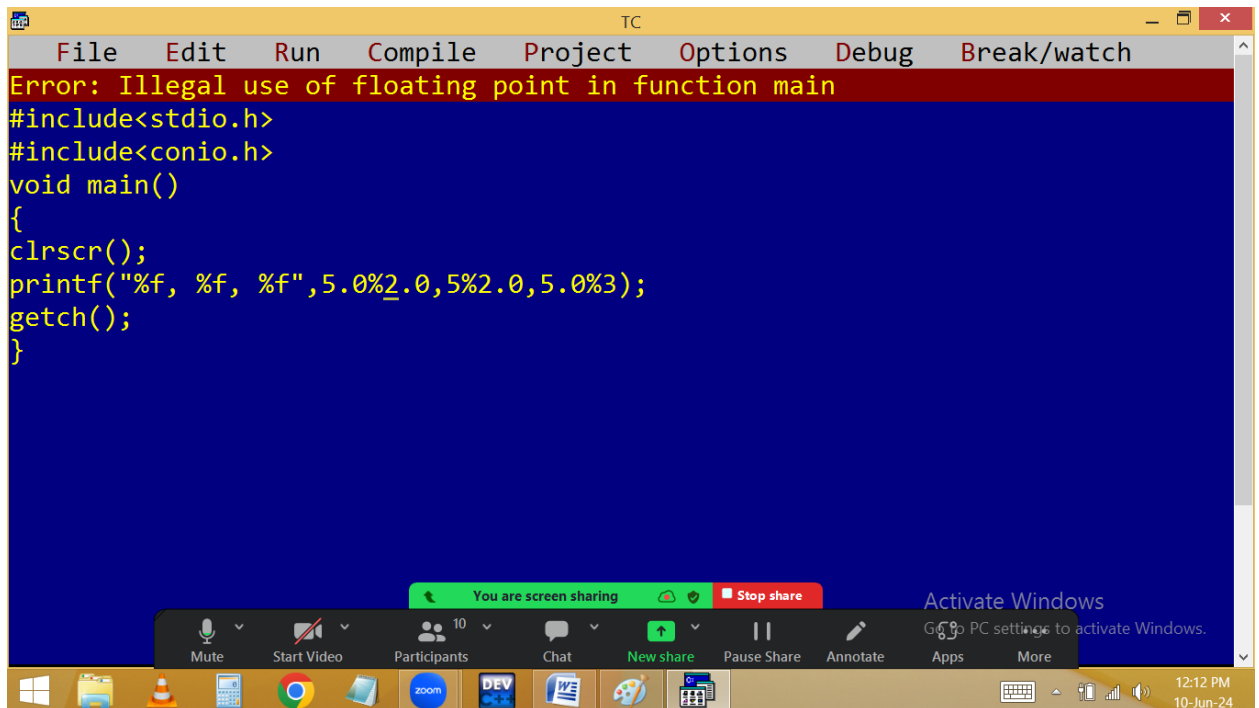
Note: if the divisor is bigger than dividend then dividend is the answer.

```
File Edit Run Compile Project Options Debug Break/watch
Line 6 Col 34 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d, %d, %d",5%2,2%5,15%34);
getch();
}
```

```
1, 2, 15_
```

5.0%2.0=Error

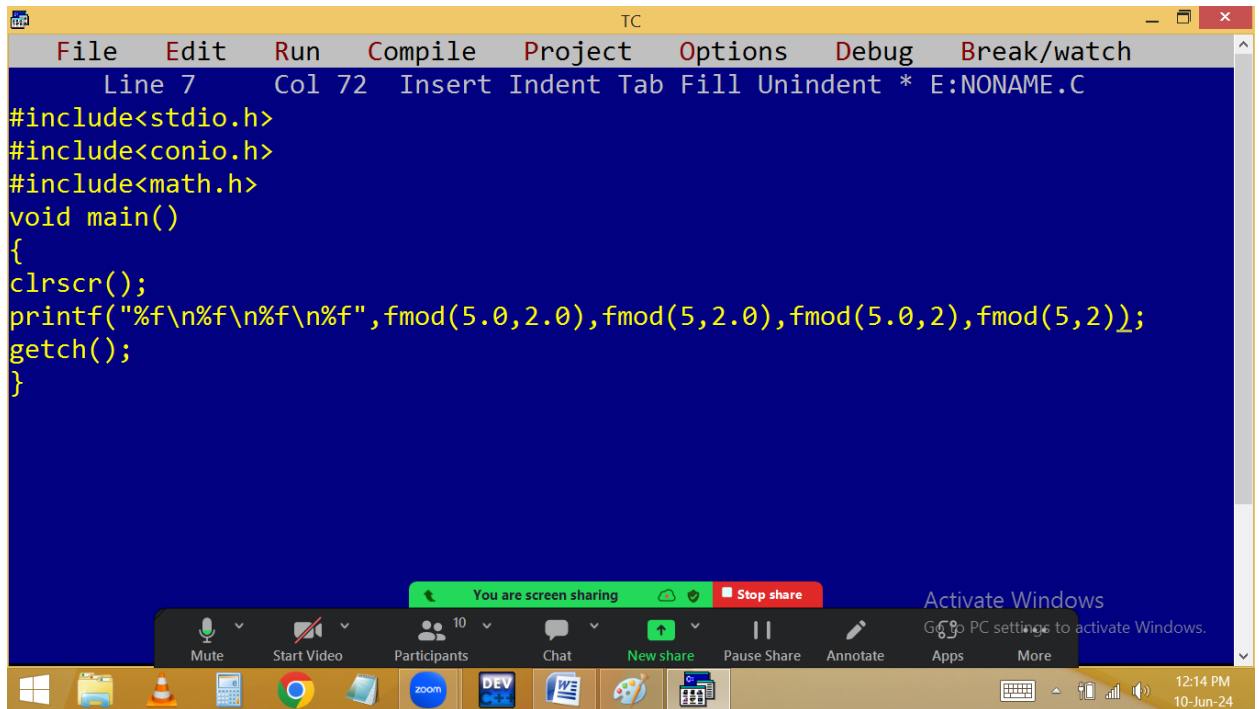
Note: we can't perform floating modules with % operator in C & C++. To this we have to use **fmod()** available in **<math.h>**



The screenshot shows a Turbo C++ (TC) IDE window. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message banner at the top reads "Error: Illegal use of floating point in function main". The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%f, %f, %f",5.0%2.0,5%2.0,5.0%3);
getch();
}
```

At the bottom of the screen, there is a Windows taskbar with various icons and a system tray showing the time as 12:12 PM on 10-Jun-24. A Zoom overlay is visible, indicating "You are screen sharing" with a "Stop share" button.



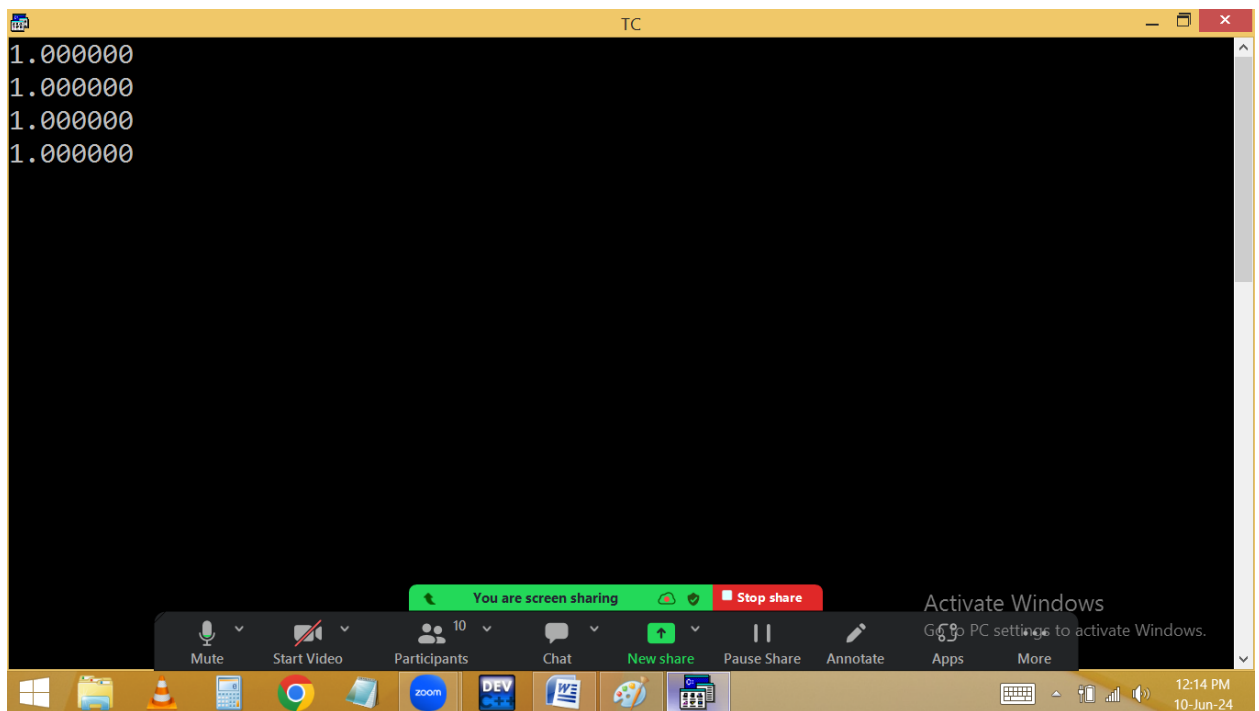
```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 7 Col 72 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
clrscr();
printf("%f\n%f\n%f\n%f",fmod(5.0,2.0),fmod(5,2.0),fmod(5.0,2),fmod(5,2));
getch();
}
```

You are screen sharing Stop share

Mute Start Video Participants 10 Chat New share Pause Share Annotate Apps More

Activate Windows Go to PC settings to activate Windows.

12:14 PM 10-Jun-24



```
TC
1.000000
1.000000
1.000000
1.000000
```

You are screen sharing Stop share

Mute Start Video Participants 10 Chat New share Pause Share Annotate Apps More

Activate Windows Go to PC settings to activate Windows.

12:14 PM 10-Jun-24

$$29\mathbf{1}\%10=1$$

$$7\mathbf{4}\%10=4$$

$$\mathbf{3}\%10=3$$

Note: Any $\text{no}\%10$ gives last digit.

TC

File Edit Run Compile Project Options Debug Break/watch

Line 6 Col 36 Insert Indent Tab Fill Unindent * E:NONAME.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d%d%d",291%10, 74%10, 3%10);
getch();
}
```

You are screen sharing Stop share

Activate Windows
Go to PC settings to activate Windows.

Mute Start Video Participants 10 Chat New share Pause Share Annotate Apps More

12:18 PM 10-Jun-24

TC

143

You are screen sharing Stop share

Activate Windows
Go to PC settings to activate Windows.

Mute Start Video Participants 10 Chat New share Pause Share Annotate Apps More

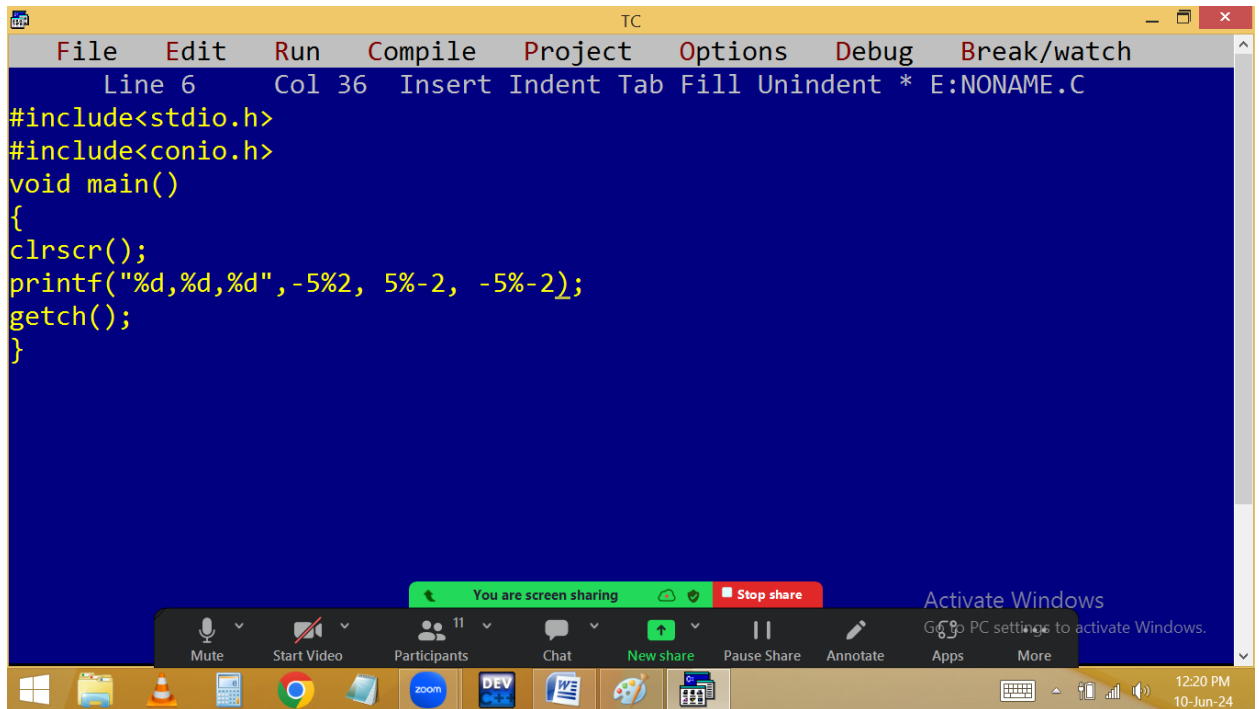
12:18 PM 10-Jun-24

$$\text{-5\%2= -1}$$

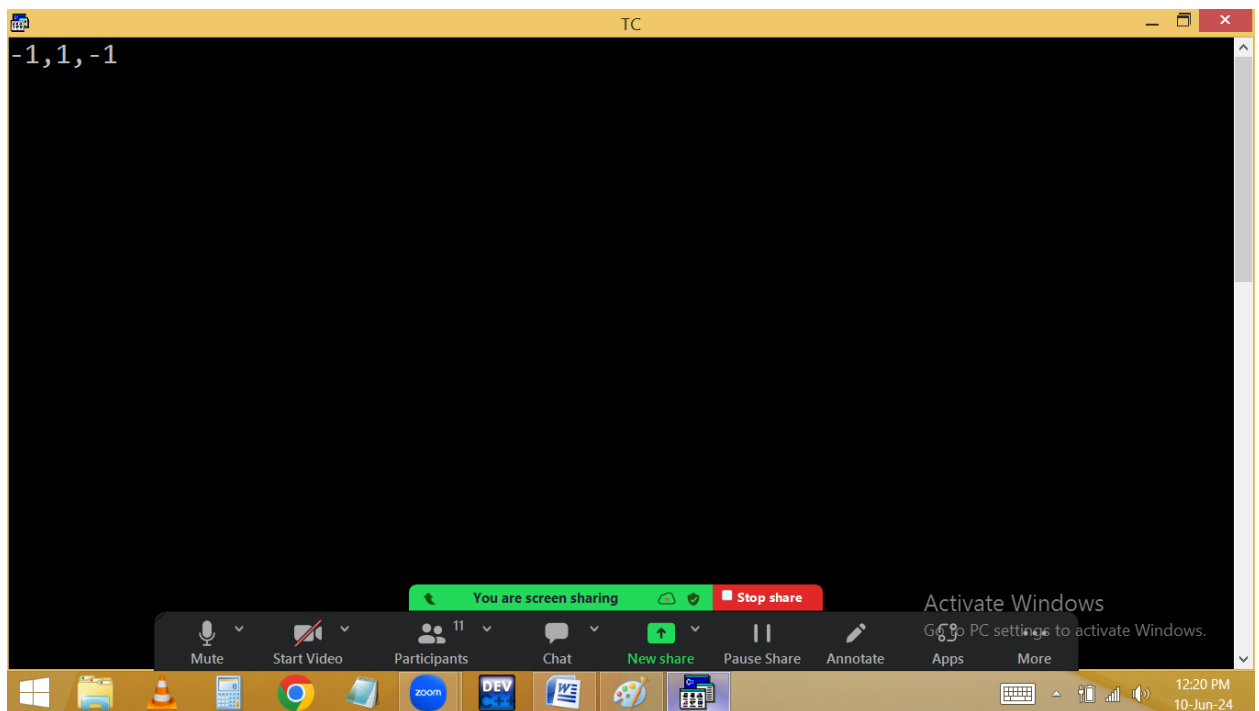
$$\text{5\%-2= 1}$$

$$\text{-5\%-2= -1}$$

Note: In modules if the numerator is negative then result also negative.



```
File Edit Run Compile Project Options Debug Break/watch
Line 6 Col 36 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d,%d,%d",-5%2, 5%-2, -5%-2);
getch();
}
```



```
-1,1,-1
```

/ - division [Quotient]:

5/2=2 [int/int=int]

5.0/2=2.500000

5/2.0=2.500000

5.0/2.0=2.500000

'a'/'b'=0 ➔ 97/98=0 [97 is ascii value of 'a']

The screenshot shows a Turbo C++ IDE window titled 'TC'. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top indicates 'Line 6 Col 23 Insert Indent Tab Fill Unindent * E:NONAME.C'. The code in the editor is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n%f\n%f\n%d",5/2, 5.0/2, 5.0/2.0, 'a'/'b');
getch();
}
```

Below the code editor, there is a Zoom toolbar with options like Mute, Start Video, Participants (11), Chat, New share, Pause Share, Annotate, Apps, and More. A green banner above the toolbar says 'You are screen sharing' with a 'Stop share' button. A Windows watermark 'Activate Windows Go to PC settings to activate Windows.' is visible.

The output window at the bottom shows the following results:

```
2
2.500000
2.500000
0_
```

The output window also has a similar Zoom toolbar and a green 'You are screen sharing' banner. The Windows taskbar at the bottom shows the time as 12:26 PM on 10-Jun-24.

(float) 5/2= 2.500000 /* Explicit type casting */

(int) 5.0/2= 2 /* Explicit type casting */

Int a=1.3; ➔ a=1 /* implicit type casting */

**Float b=10; ➔ b=10.000000/*implicit type casting
*/**

5/(float)2=2.500000

(float)(5/2)=2.000000

```
TC
#include<stdio.h>
#include<conio.h>
void main()
{
int a=1.7; /* implicit type casting */
float b=10;
clrscr();
printf("a=%d\n",a);
printf("b=%f\n",b);
printf("%f\n",(float)5/2); /* explicit type casting */
printf("%d\n",(int)5.0/2);
printf("%f\n",(float)5/(float)2);
printf("%f\n",5/(float)2);
printf("%f\n",(float)(5/2));
printf("%f\n",(float)'a'/'b');
getch();
}
```

TC

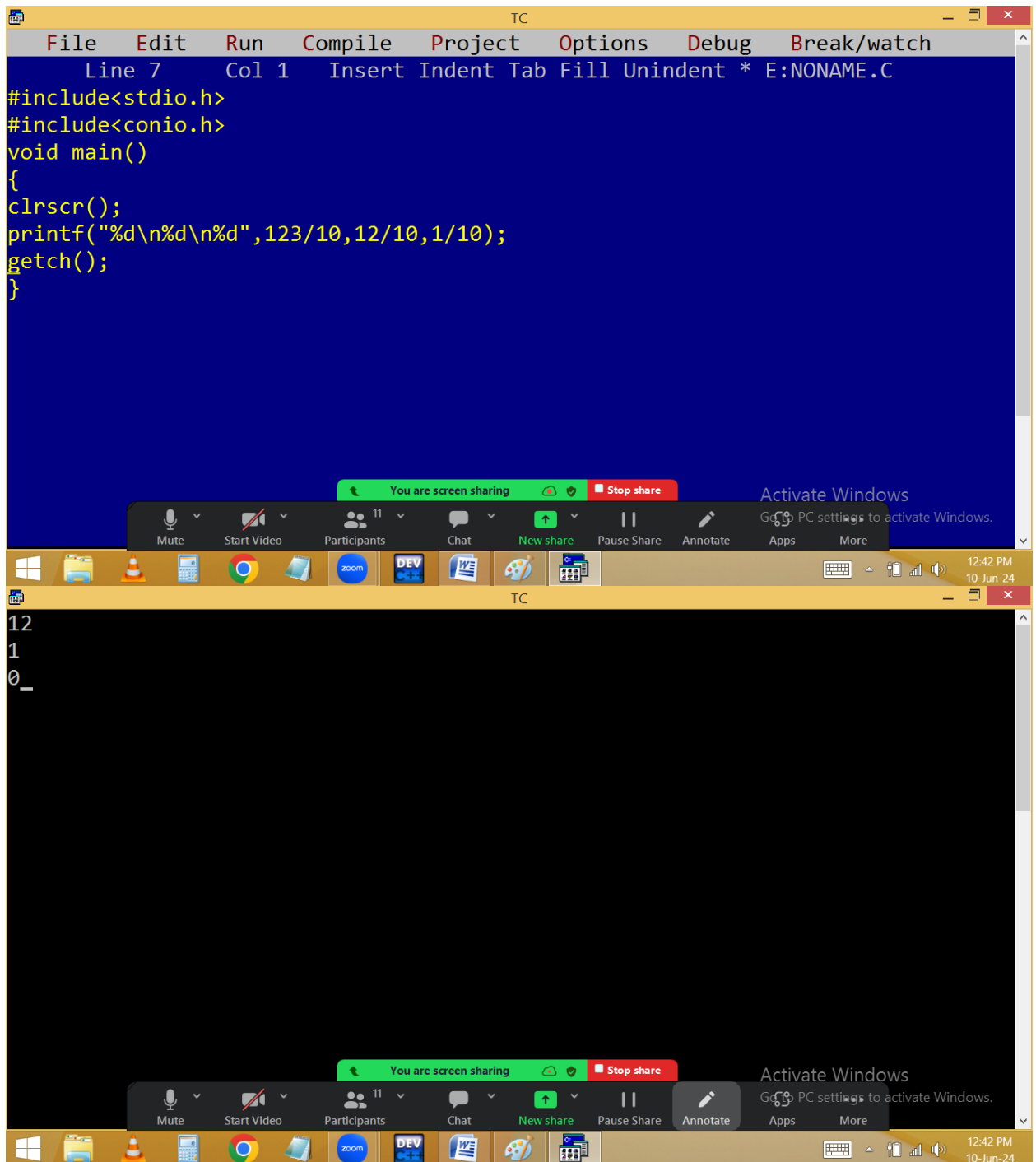
a=1
b=10.000000
2.500000
2
2.500000
2.500000
2.000000
0.989796

$$123/10=12$$

$$12/10=1$$

$$1/10=0$$

Note: Any no/10 removes the last digit.



The image shows a screenshot of a Turbo C++ (TC) IDE. The top window displays a C program with the following code:

```
File Edit Run Compile Project Options Debug Break/watch
Line 7 Col 1 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n%d\n%d",123/10,12/10,1/10);
getch();
}
```

The bottom window shows the output of the program:

```
12
1
0_
```

The IDE interface includes a menu bar at the top, a toolbar with icons for various functions, and a status bar at the bottom. A Zoom toolbar is also visible in the center of the IDE windows.

The image shows a screenshot of a Turbo C++ (TC) IDE. The top window displays a C program with the following code:

```
File Edit Run Compile Project Options Debug Break/watch
Line 6 Col 38 Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n%d\n%d",-5/2, 5/-2, -5/-2);
getch();
}
```

The bottom window shows the output of the program, which is:

```
-2
-2
2_
```

The IDE interface includes a menu bar, a toolbar, and a status bar. A Windows taskbar is visible at the bottom of the screen, showing the time as 12:44 PM on 10-Jun-24.

Note: In division any one operand is negative then result also negative. If both are negative then result is positive.

Home work:

Print a 3 digit no in reverse order without using loop.

Ex: 123 reverse is 321

