

# OPERATORS

Operator is a special symbol used to do a particular task [ work ]. 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--, ++a, --a, sizeof(a), ~a, !a,...

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

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

### 3. **Ternary / Conditional operator[?:]**

Require three operands.

**Eg: a>b ?"a big": "b big";**

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. constant or expressions not allowed on left side.

**Eg:**

**a=10;**

**b=1.2;**

**c='X';**

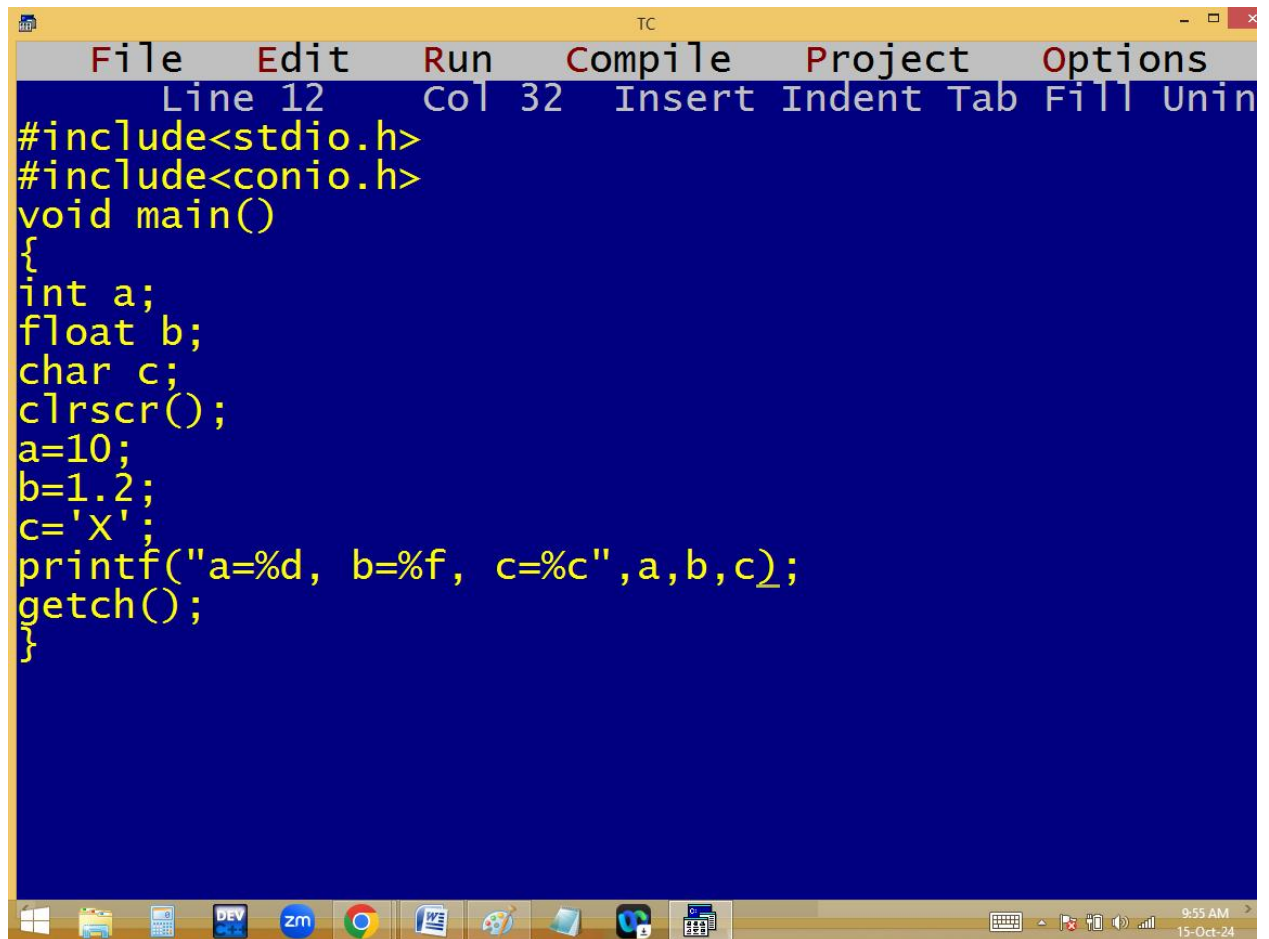
**d="abc"; ➔ Lvalue error**

**10=20; ➔ Lvalue error**

**c=a+b;**

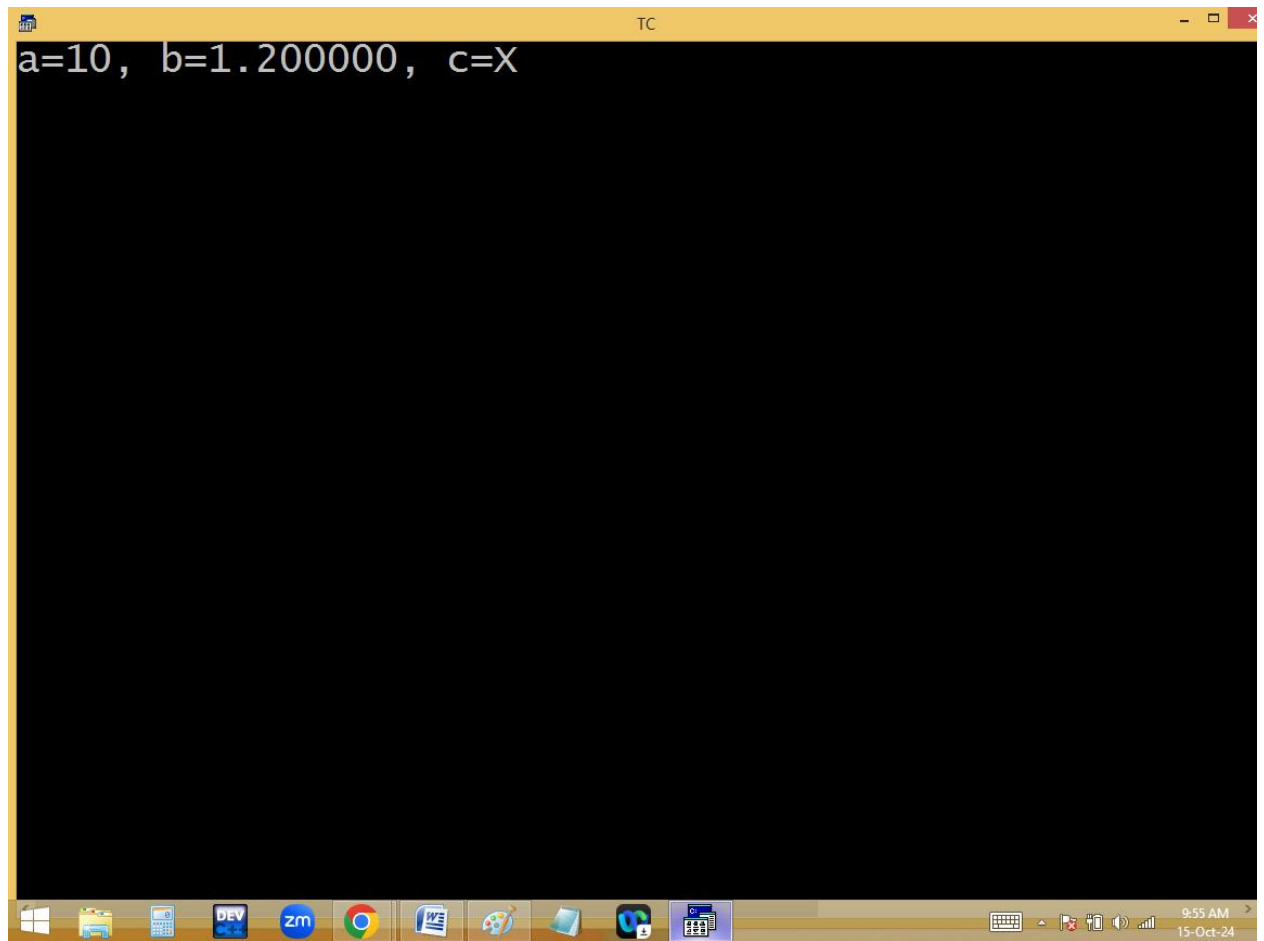
**a+b=c; ➔ Lvalue error**

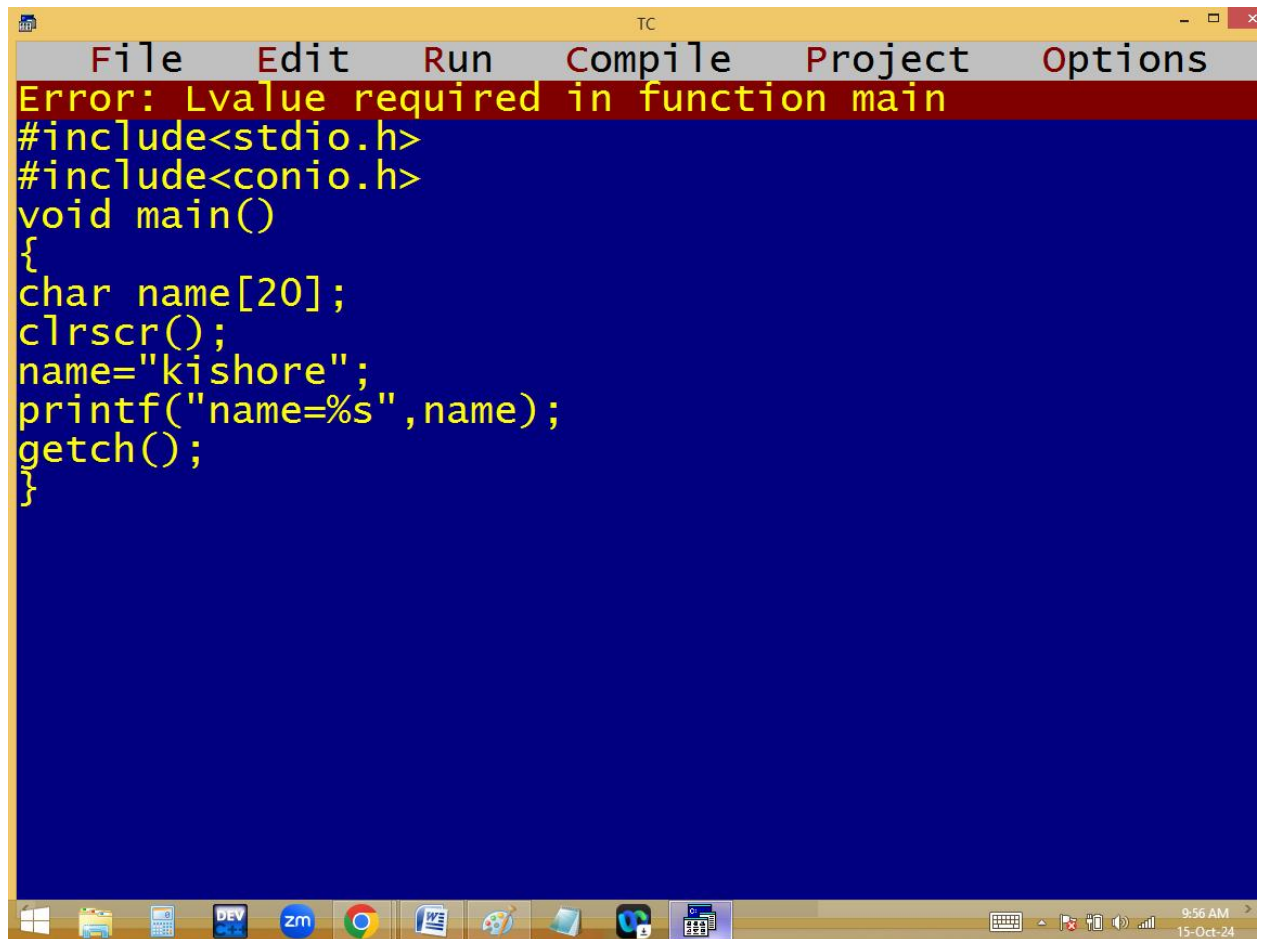
**a=b=c=100;**



```
TC
File Edit Run Compile Project Options
Line 12 Col 32 Insert Indent Tab Fill Unin
#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();
}
```

Windows taskbar: 9:55 AM, 15-Oct-24

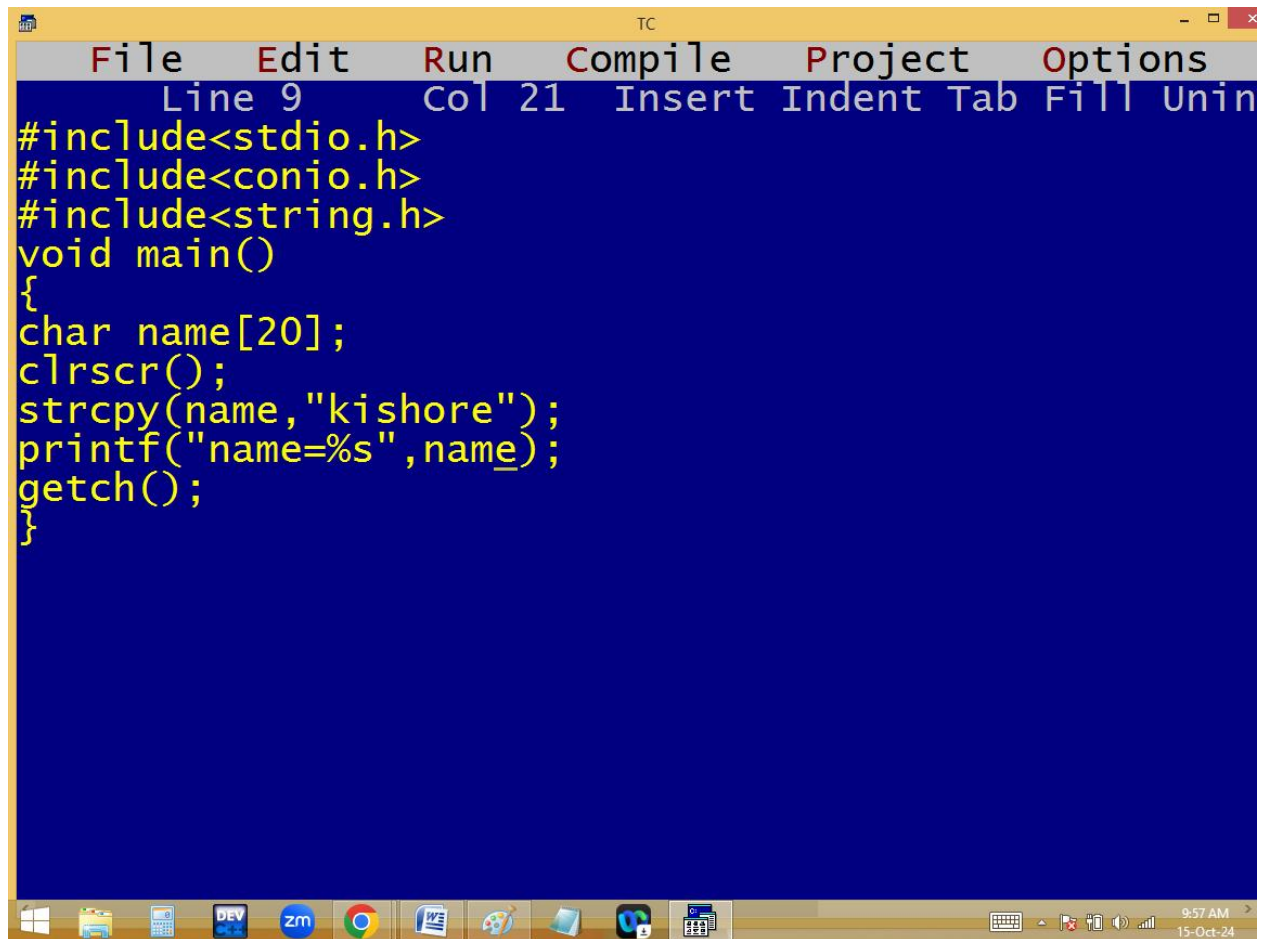




The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar at the top reads "TC". Below the title bar is a menu bar with the following options: "File", "Edit", "Run", "Compile", "Project", and "Options". A red error message banner is displayed across the top of the code area, stating "Error: Lvalue required in function main". The code area has a dark blue background with yellow text. The code is as follows:

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

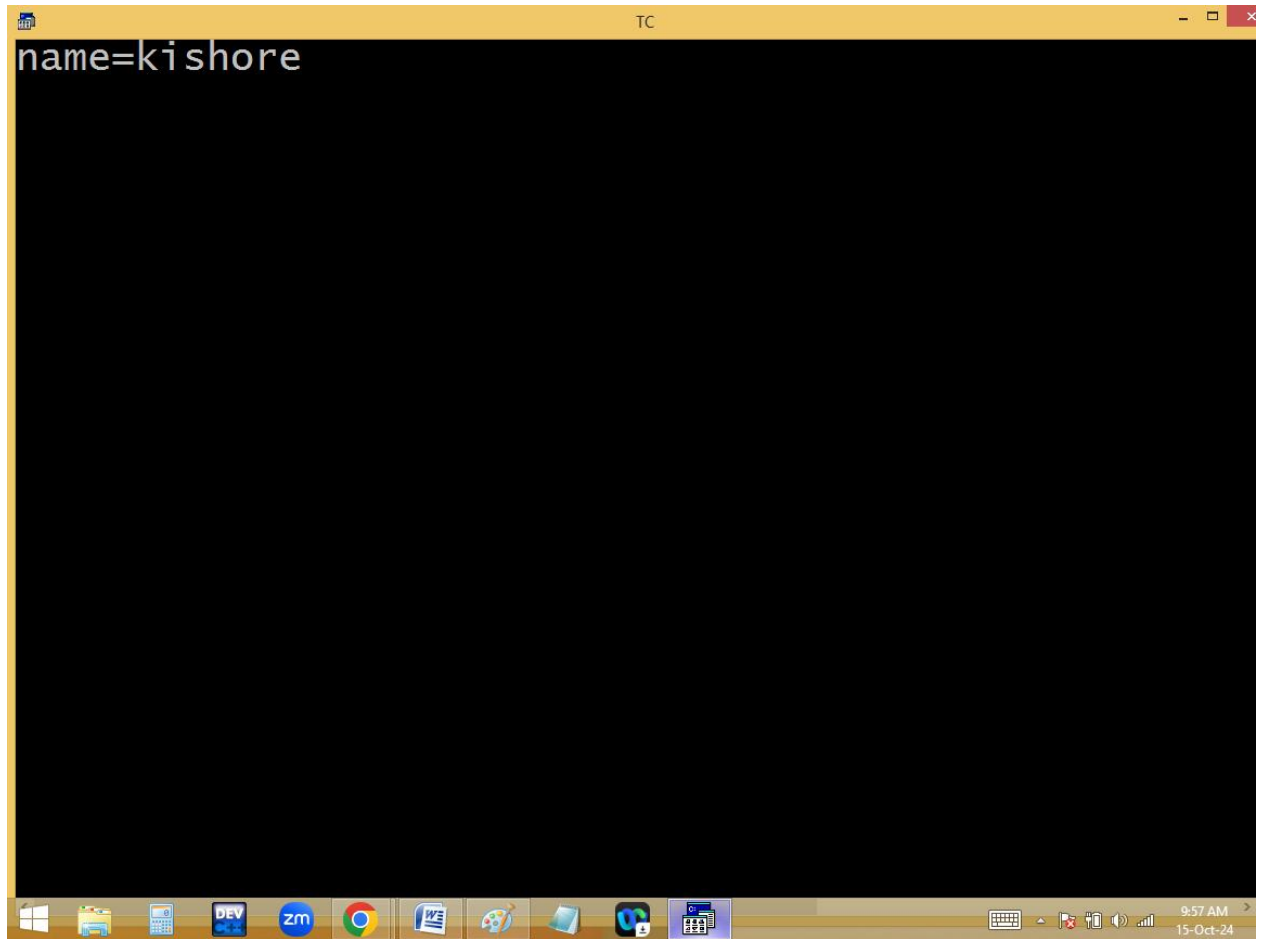
At the bottom of the window is a Windows taskbar. It contains several icons: the Windows Start button, a folder icon, a calculator icon, a "DEV" icon, a "zm" icon, a Google Chrome icon, a Notepad icon, a Paint icon, a file explorer icon, a Teams icon, and a calendar icon. On the right side of the taskbar, the system clock shows "9:56 AM" and "15-Oct-24".



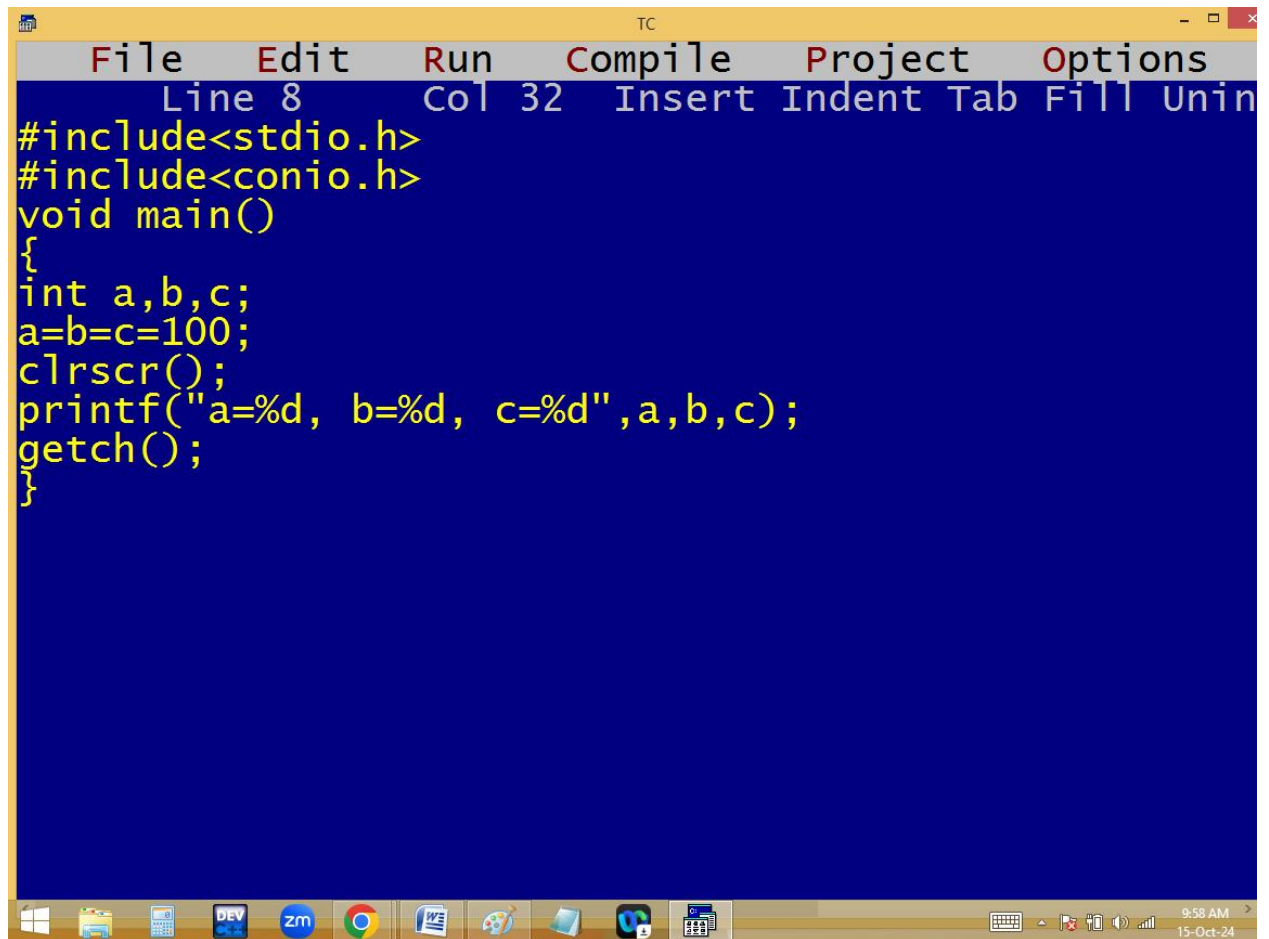
The image shows a screenshot of a Turbo C++ (TC) IDE window. The window has a yellow title bar with the text "TC" and standard window controls. Below the title bar is a menu bar with the following options: File, Edit, Run, Compile, Project, and Options. A status bar at the top of the editor area shows "Line 9" and "Col 21". The editor area has a dark blue background with yellow text. The code is as follows:

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

At the bottom of the screen is a Windows taskbar with several icons: Windows Start button, File Explorer, Calculator, DEV C++, Zoom (zm), Google Chrome, Microsoft Word, Paint, a folder icon, a game controller icon, and a task manager icon. The system tray on the right shows the date and time: "9:57 AM" and "15-Oct-24".

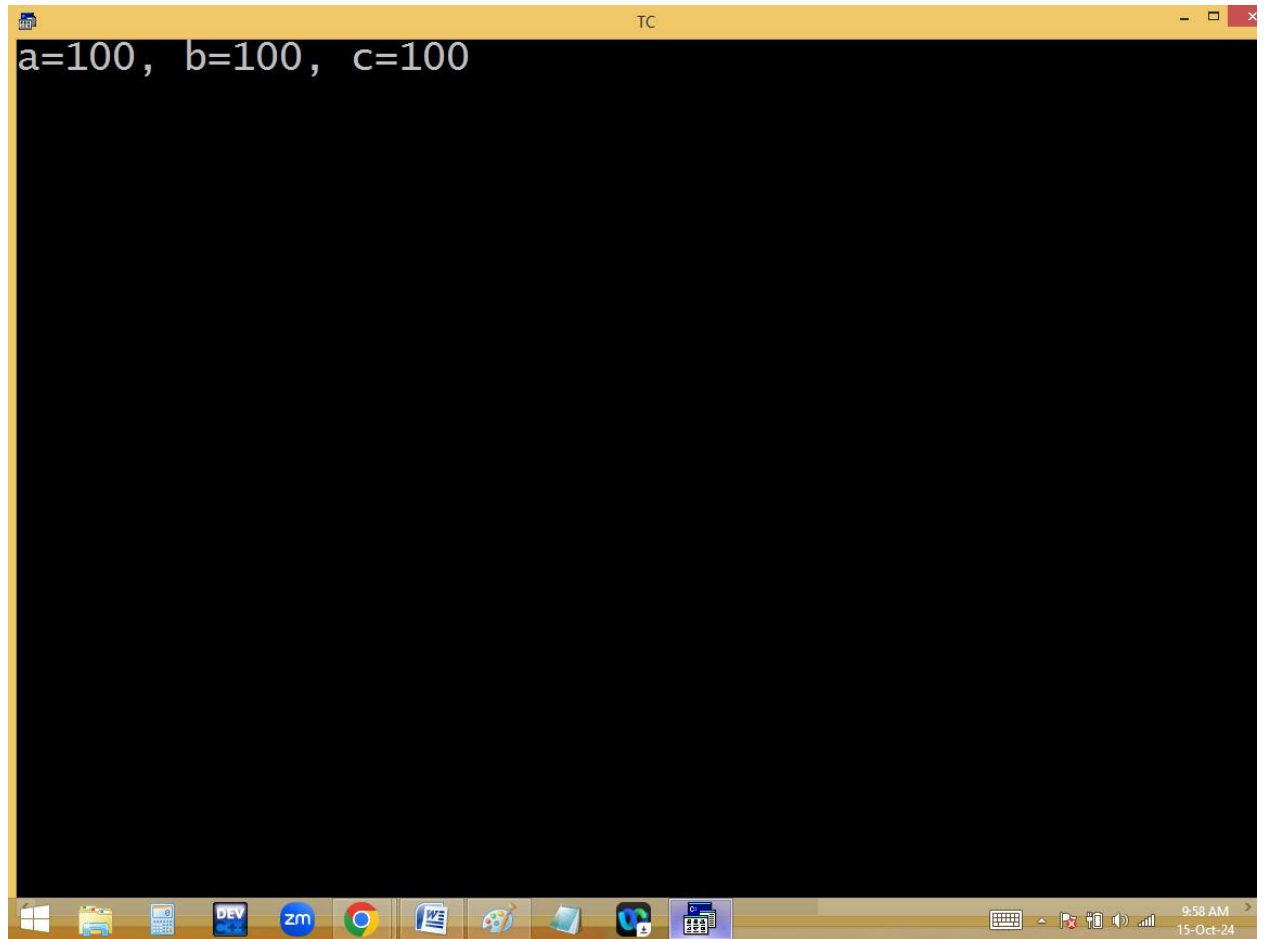


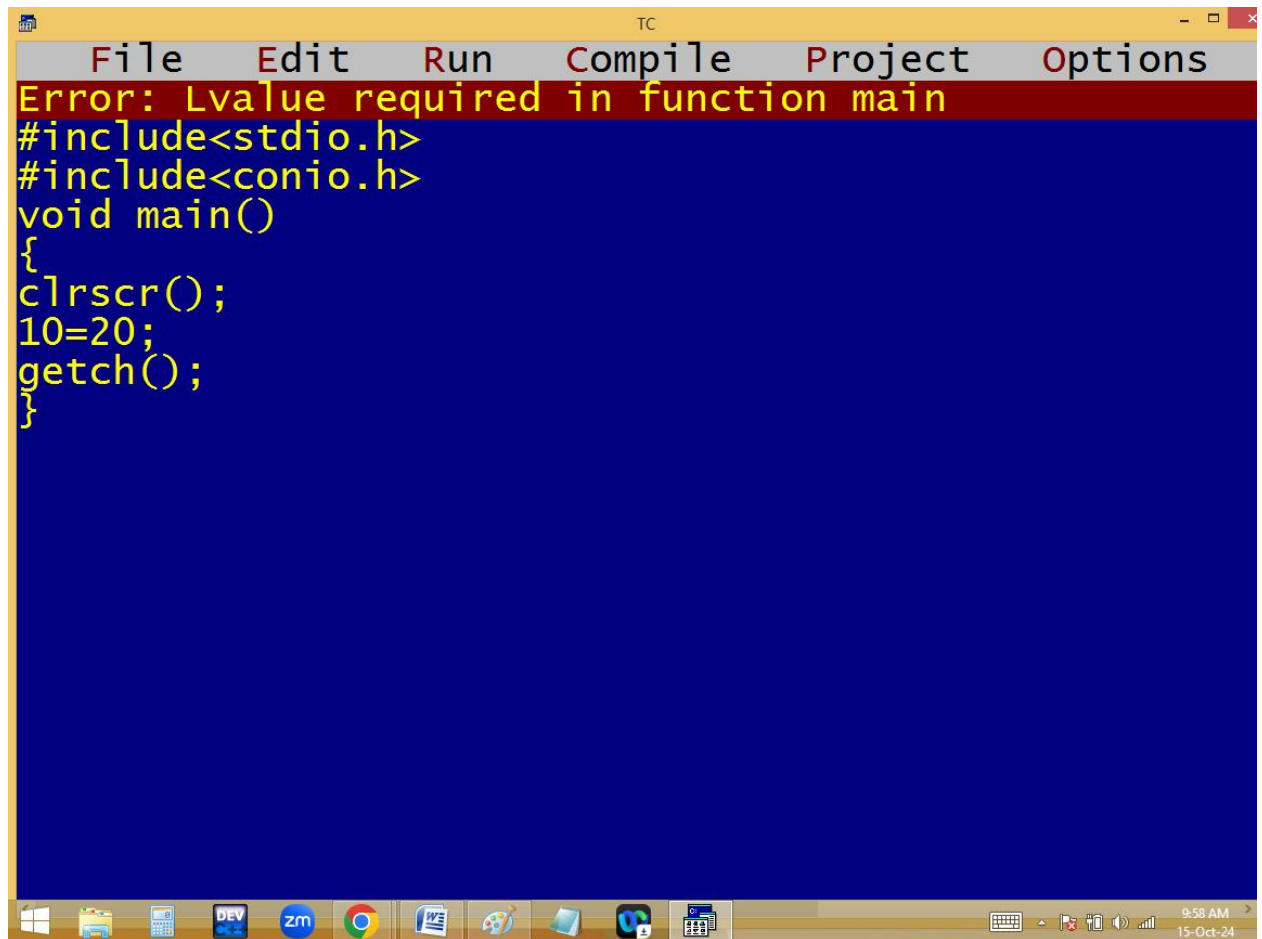




```
TC
File Edit Run Compile Project Options
Line 8 Col 32 Insert Indent Tab Fill Unin
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
a=b=c=100;
clrscr();
printf("a=%d, b=%d, c=%d",a,b,c);
getch();
}
```

9:58 AM  
15-Oct-24

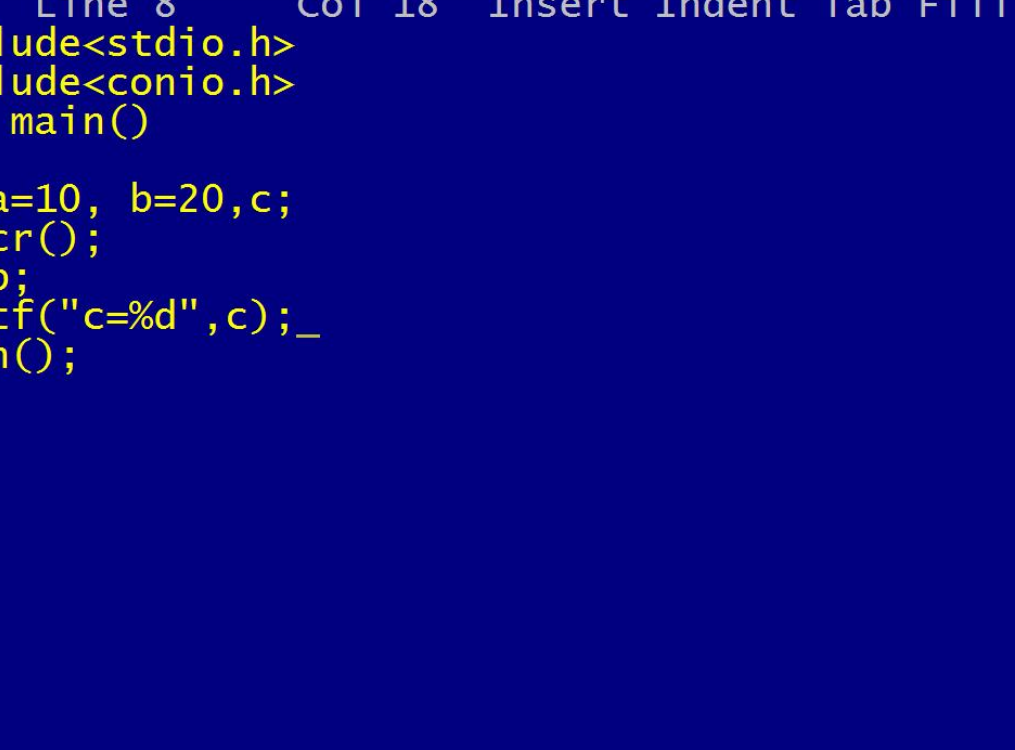




The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar at the top reads "TC". Below the title bar is a menu bar with the following options: "File", "Edit", "Run", "Compile", "Project", and "Options". The main editing area has a dark blue background with yellow text. At the top of this area, a red error message is displayed: "Error: Lvalue required in function main". Below the error message, the following C code is visible:

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

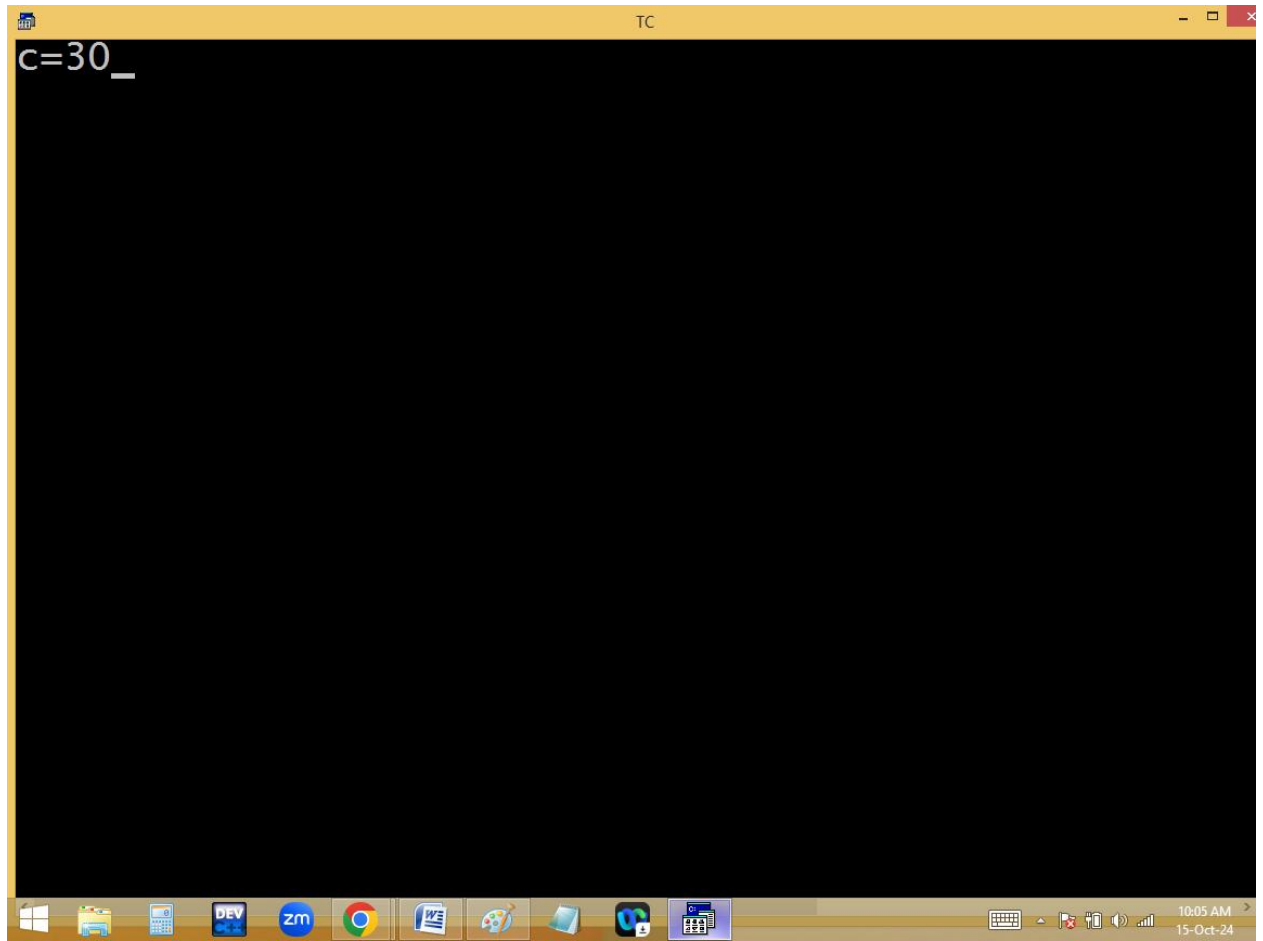
The code contains a syntax error on the line "10=20;", where a constant is being assigned to a constant. The IDE window is positioned on a Windows desktop. The taskbar at the bottom shows several icons: the Windows Start button, a folder icon, a calculator icon, a "DEV" icon, a "zm" icon, the Google Chrome icon, a document icon, a paint icon, a folder icon, a Teams icon, and a calendar icon. On the right side of the taskbar, the system tray shows the date and time as "9:58 AM" and "15-Oct-24".

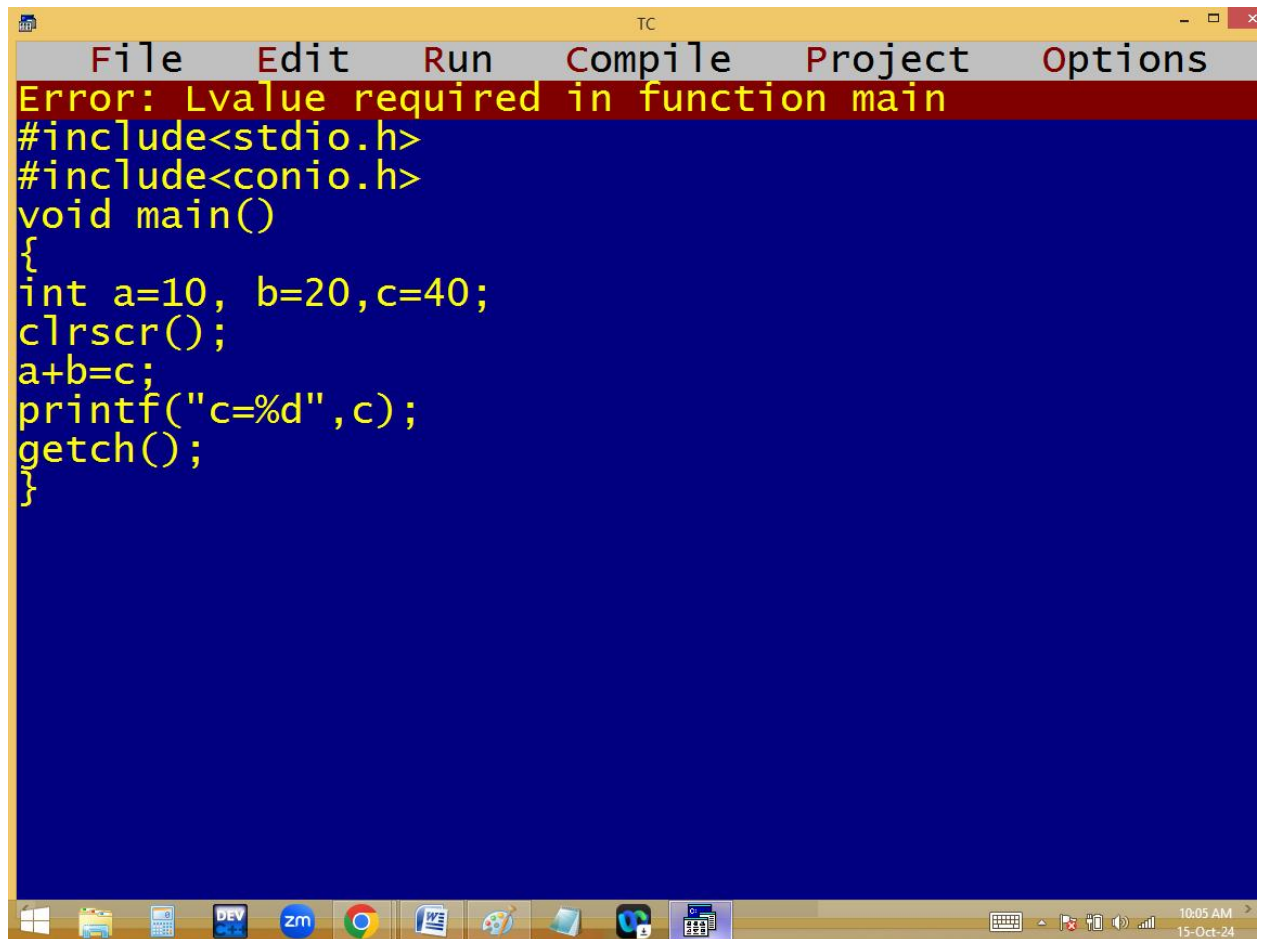


The screenshot shows the Turbo C++ IDE interface. The menu bar at the top includes File, Edit, Run, Compile, Project, and Options. The status bar at the top indicates Line 8, Col 18, and lists Insert, Indent, Tab, Fill, and Unin. The main editing area has a blue background and contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, b=20,c;
clrscr();
c=a+b;
printf("c=%d",c);_
getch();
}
```

The Windows taskbar at the bottom shows various icons including the Start button, File Explorer, Calculator, DEV C++, Zoom, Google Chrome, Word, Paint, and a folder icon. The system tray on the right shows the date and time as 10:04 AM on 15-Oct-24.





The screenshot shows a Turbo C++ (TC) IDE window. The title bar reads 'TC'. The menu bar includes 'File', 'Edit', 'Run', 'Compile', 'Project', and 'Options'. A red error message banner at the top states 'Error: Lvalue required in function main'. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=10, b=20,c=40;
    clrscr();
    a+b=c;
    printf("c=%d",c);
    getch();
}
```

The Windows taskbar at the bottom shows various icons including Windows, File Explorer, Calculator, DEV C++, Zoom, Chrome, Word, Paint, and others. The system clock in the bottom right corner indicates '10:05 AM' and '15-Oct-24'.

## 2. **Arithmetic operators [ +, -, \*, %, / ]:**

They are used to perform mathematical calculations.

Eg:  $a+b$ ,  $a-b$ ,  $a*b$ ,  $a\%b$ ,  $a/b$ ,.....

**% - modules [ Remainder ]:**

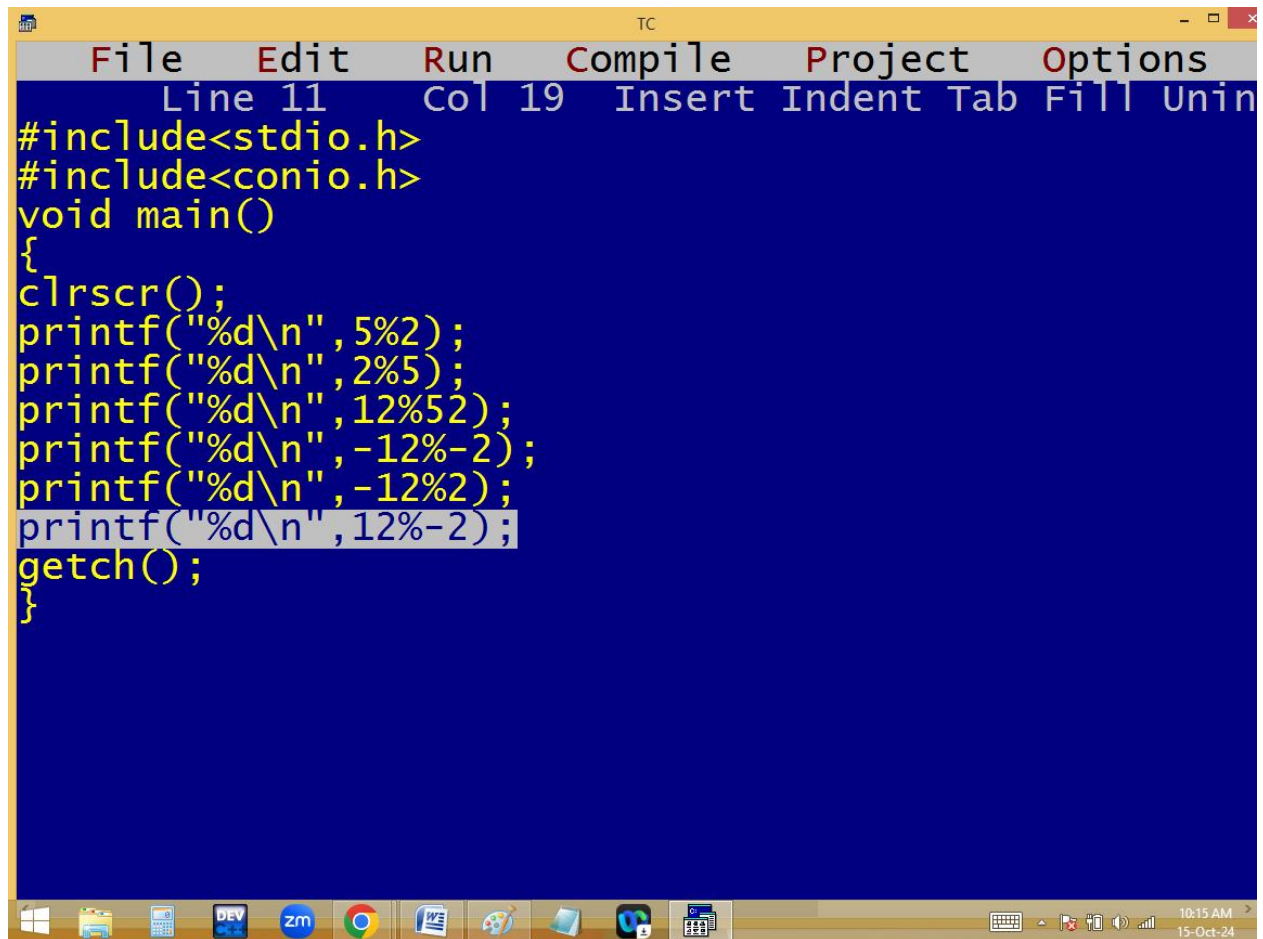
$$5\%2=1$$

$$\begin{array}{r}
 2 \overline{) 5} \quad ( 2 \leq \text{Quotient} \\
 \underline{4} \\
 1
 \end{array}$$

% Remainder ==> 1

$$2 \% 5 = 2$$

**Note:** If the divisor bigger than dividend then dividend is the answer.

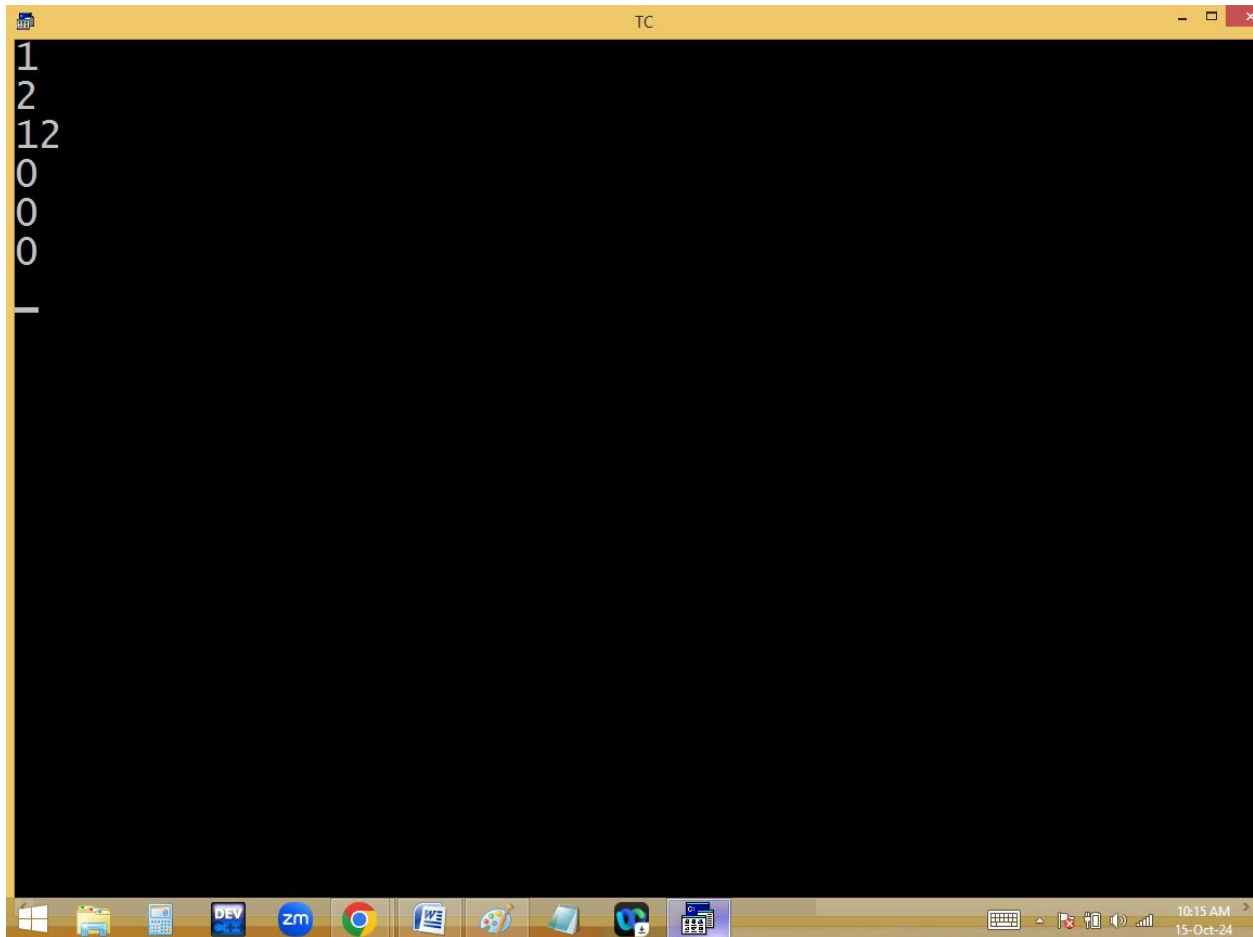


The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar at the top reads "TC". Below it is a menu bar with the following options: File, Edit, Run, Compile, Project, and Options. A status bar below the menu bar displays "Line 11", "Col 19", and "Insert Indent Tab Fill Unin". The main editing area has a dark blue background with yellow text. The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n",5%2);
printf("%d\n",2%5);
printf("%d\n",12%52);
printf("%d\n",-12%-2);
printf("%d\n",-12%2);
printf("%d\n",12%-2);
getch();
}
```

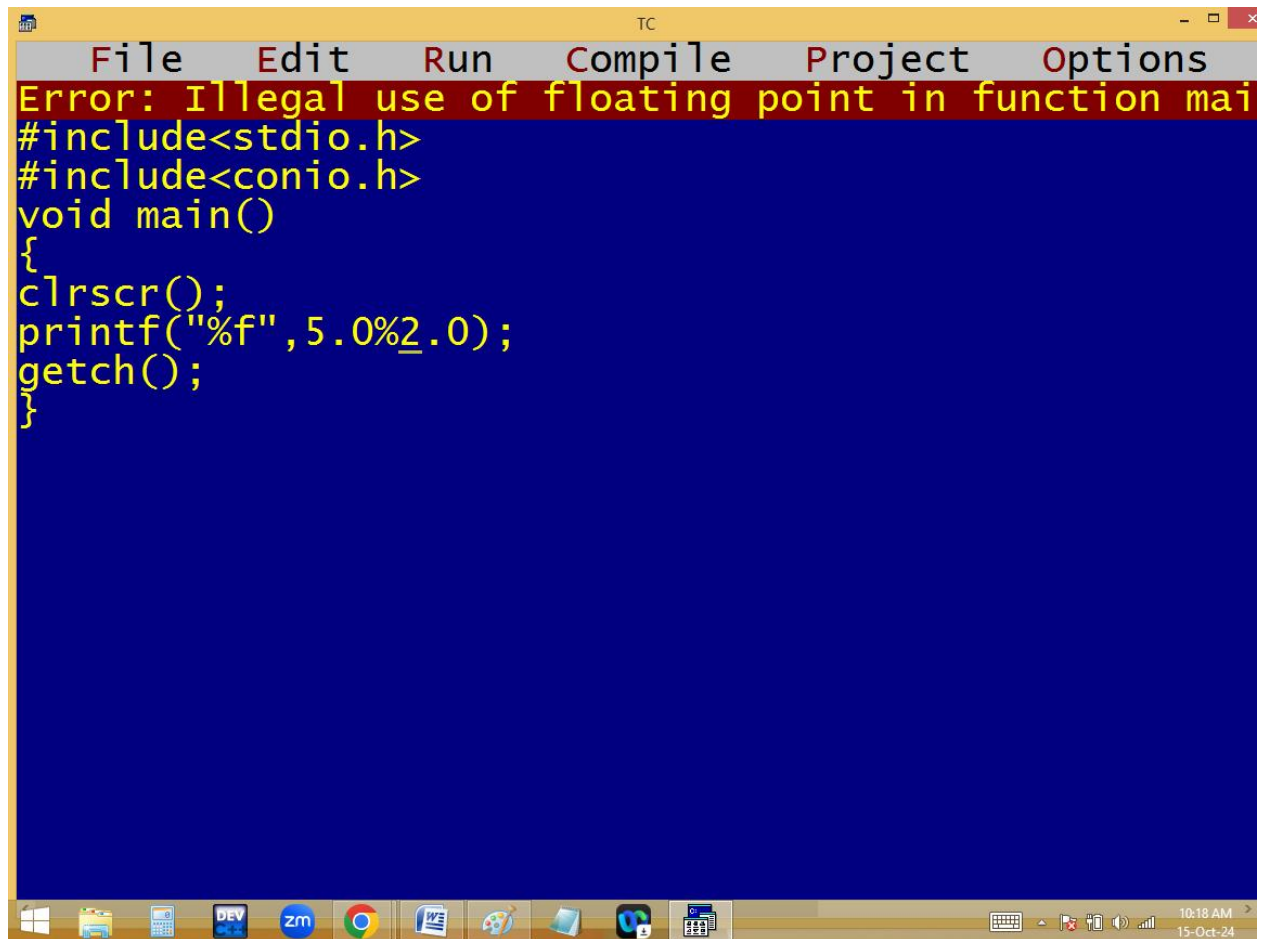
The line `printf("%d\n",12%-2);` is highlighted with a light blue selection background. At the bottom of the screen is a Windows taskbar with various icons including Windows Start, File Explorer, Calculator, DEV C++, Zoom, Google Chrome, Word, Paint, and others. The system clock in the bottom right corner shows "10:15 AM" and "15-Oct-24".





**5.0 % 2.0 = Error**

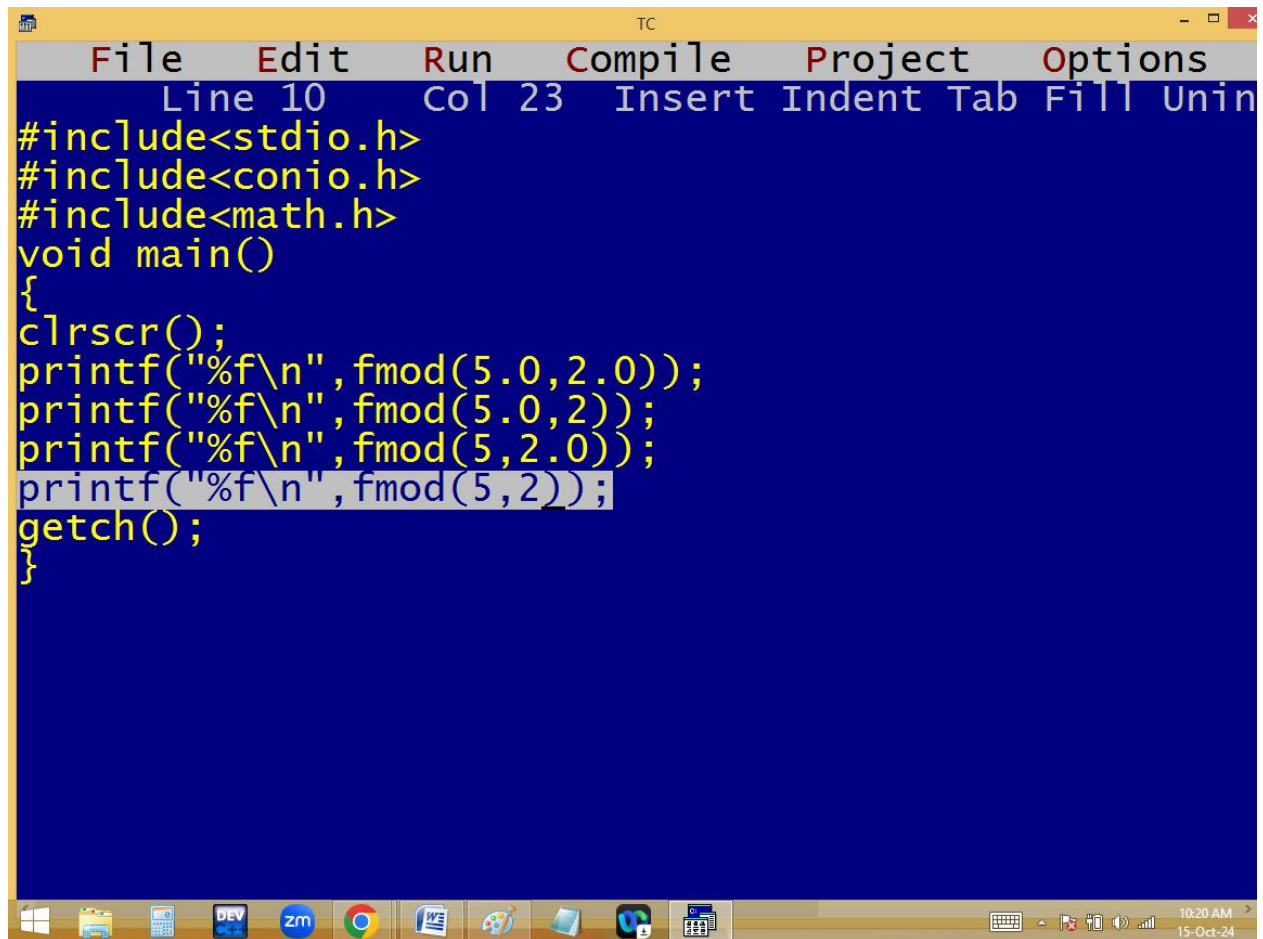
**Note:** We can't do floating modules with % operator in C & C++. For this we have to use **fmod()** available in **<math.h>**



The image shows a screenshot of a Turbo C++ (TC) IDE window. The title bar at the top reads "TC". Below the title bar is a menu bar with the following options: File, Edit, Run, Compile, Project, and Options. The main editing area has a dark blue background and contains the following C code:

```
Error: Illegal use of floating point in function mai
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%f",5.0%2.0);
getch();
}
```

The first line of the code, "Error: Illegal use of floating point in function mai", is highlighted in red and yellow, indicating a compilation error. The rest of the code is in yellow text on a blue background. The code includes two header files, `<stdio.h>` and `<conio.h>`, and defines a `main` function. Inside the function, it calls `clrscr()`, `printf("%f",5.0%2.0);`, and `getch()`. The `printf` statement is the source of the error, as it uses the `%f` format specifier for a floating-point number, but the argument is an integer expression `5.0%2.0`. The Windows taskbar is visible at the bottom, showing various application icons and the system clock indicating 10:18 AM on 15-Oct-24.



```
TC
File Edit Run Compile Project Options
Line 10 Col 23 Insert Indent Tab Fill Unin
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
clrscr();
printf("%f\n",fmod(5.0,2.0));
printf("%f\n",fmod(5.0,2));
printf("%f\n",fmod(5,2.0));
printf("%f\n",fmod(5,2));
getch();
}
```

10:20 AM  
15-Oct-24

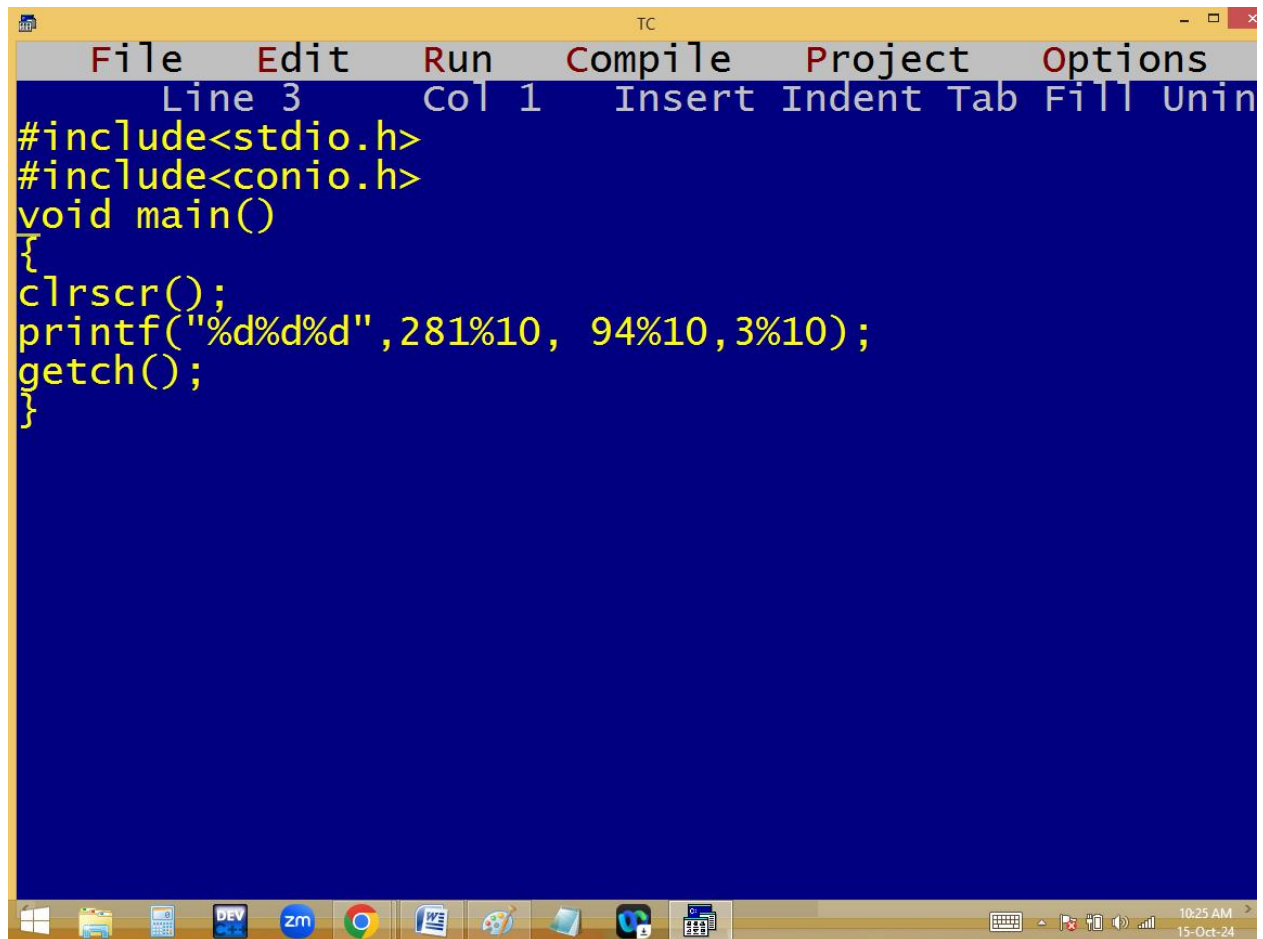
```
TC
1.000000
1.000000
1.000000
1.000000
_
```

$$28\mathbf{1} \% 10 = 1$$

$$9\mathbf{4} \% 10 = 4$$

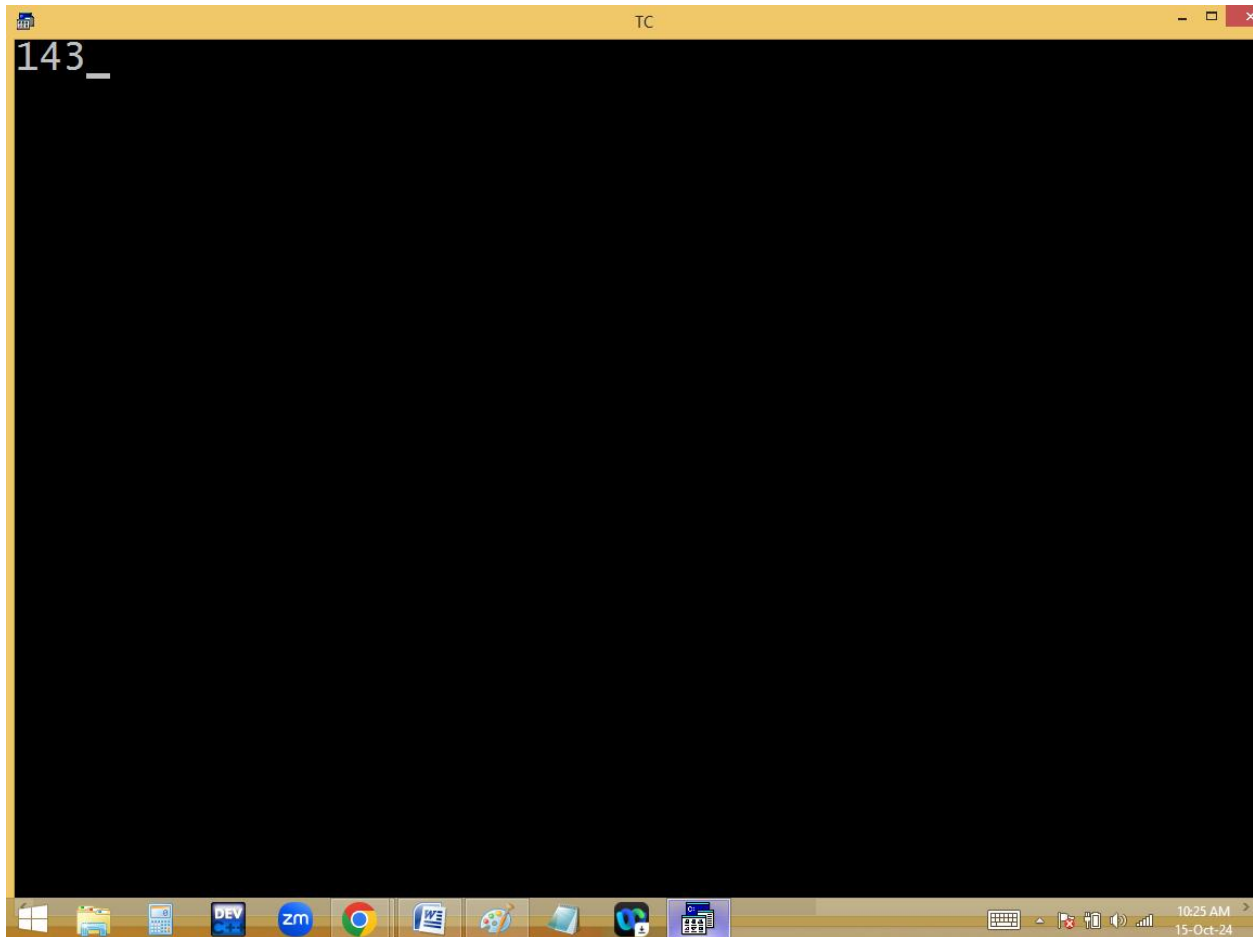
$$\mathbf{3} \% 10 = 3$$

**Note:** Any no%10 gives last digit.



```
TC
File Edit Run Compile Project Options
Line 3 Col 1 Insert Indent Tab Fill Unin
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d%d%d",281%10, 94%10,3%10);
getch();
}
```

10:25 AM  
15-Oct-24

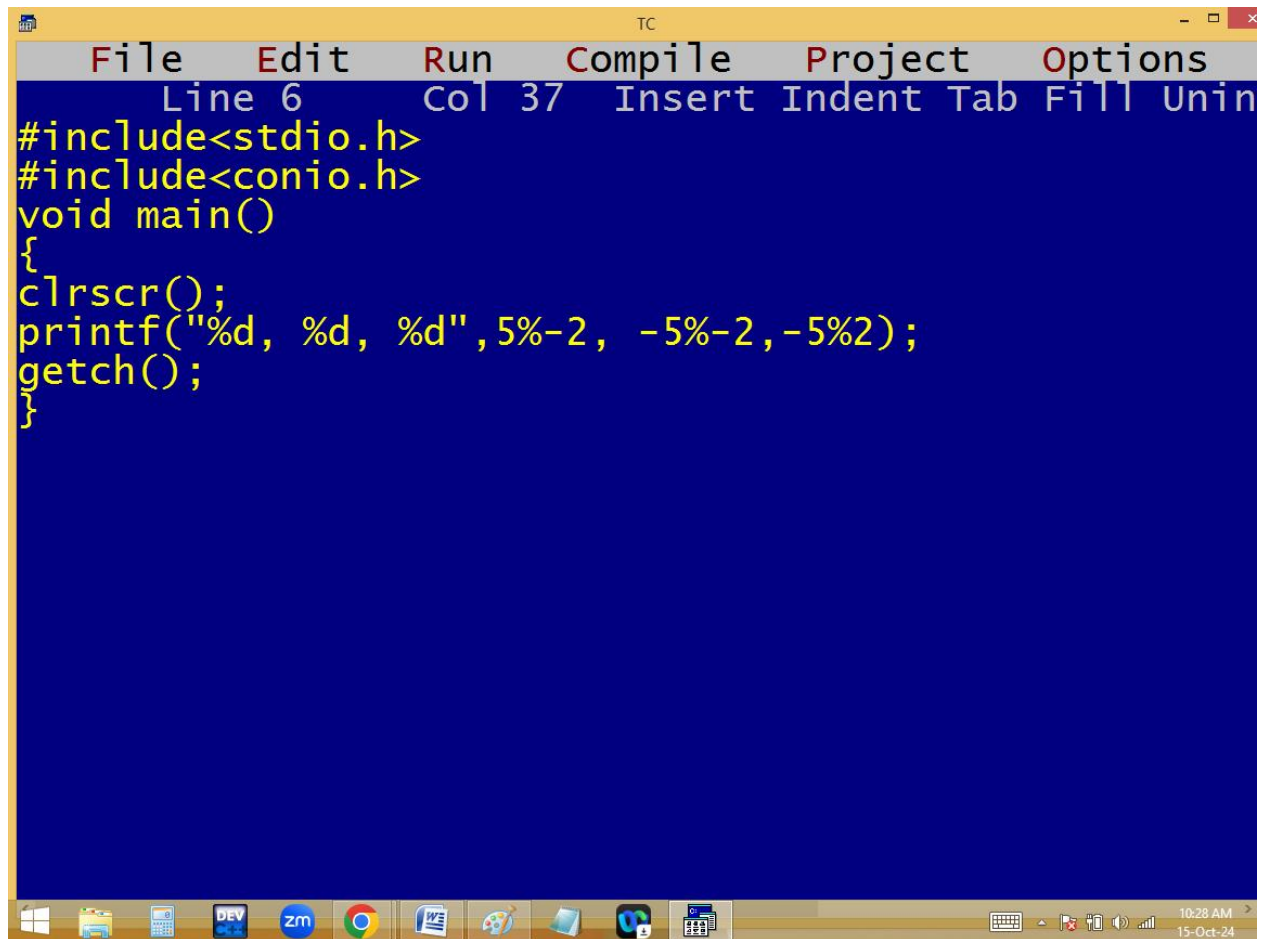


$$5\%-2= 1$$

$$-5\%-2= -1$$

$$-5\%2= -1$$

**Note: if the numerator is negative then result also negative.**



```
TC
File Edit Run Compile Project Options
Line 6 Col 37 Insert Indent Tab Fill Unin
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d, %d, %d",5%-2, -5%-2,-5%2);
getch();
}
```

10:28 AM  
15-Oct-24



**/ - division [ Quotient ]:**

**$5/2=2$  [ int/int=int ]**

**$5.0/2=2.500000$**

**$5/2.0=2.500000$**

**$5.0/2.0=2.500000$**



**Note:** In division both operands are int then result also int. any one or both are floats then result also float.

**(float)**5/2=2.500000 [explicit type casting]

**(int)**5.0/2=2 [ explicit ]

Int a = 5.4; ➔ answer is a=5 [implicit]

Float b=12;answer is b=12.000000 [implicit]

**(float)**(5/2)=2.000000

**(float)** 5 / **(int)** 2.0 = 2.500000

```
TC
File Edit Run Compile Project Options
Line 17 Col 1 Insert Indent Tab Fill Uni
#include<stdio.h>
#include<conio.h>
void main()
{
int a=5.4; /*implicit type casting*/
float b=12; /* implicit type casting */
clrscr();
printf("%d\n", 5/2);
printf("%f\n", 5.0/2);
printf("%f\n", 5/2.0);
printf("%f\n", 5.0/2.0);
printf("%f\n", (float)5/2); /*explicit type casting*/
printf("%d\n", (int)5.0/2);
printf("%f\n", (float)(5/2));
printf("%d\n", a);
printf("%f\n", b);
getch();
}
```

