DATA TYPES

Data type determines the type of value we are going to store in our computer. To store anything in our computer, we should have to allocate the memory. This memory allocation is depended on the data type we are using.

Data type determines the properties such as

1. No of bytes
2. Range
3. Type of value

In C language we are having 3 **basic** data types

1. **Int – To store non-decimal numbers**
2. **Float – To store decimal numbers**
3. **Char – To stores alphabets, numbers and special char**

Total data types are divided into 3 types.

1. **Primitive data types**
2. **Derived data types**
3. **User defined data types**

PRIMITIVE DATA TYPES:

These are the regular data types we are using in our c programs.

Data type	Bytes	Conversion	Storage Range

		Character / format specifier	
int / signed int / short int	2	%d	-32768 to +32767
unsigned int	2	%u	0 to 65535
long int	4	%ld	-2147483648 to 2147483647
unsigned long int	4	%lu	0 to 4294967295
float	4	%f	$3.4 * 10^{-38}$ to $3.4 * 10^{+38}$
double	8	%lf	$1.7 * 10^{-308}$ to $1.7 * 10^{+308}$
long double	10	%Lf	$3.4 * 10^{-4932}$ to $1.1*10^{+4932}$
char	1	%c	1 character Signed char [-128 to +127] Unsigned char [0 to 255]
char[10] (STRING)	10	%s	9 char + 1 null char
void [empty data type]			nothing

DERIVED DATA TYPES:

They are derived from primitive data types.

1. **Array [non-primitive]**
2. **Pointer**
3. **Function**

USER DEFINED DATA TYPES:

These are the data types created by the user.

1. structure
2. union
3. enum

OPERATORS

Operator is a special symbol designed for 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--, sizeof(a), ~a, !a, +a, -a,….
2. **Binary operators**: Require two operands.
   Eg: a+b, a-b, a>b, a<=b, a!=b, a<<b, …..
3. **Ternary / conditional operator [? :]:** Require 3 operands / expressions.

   Conditional part ? true part : false part;

   5==5 ? true : false;

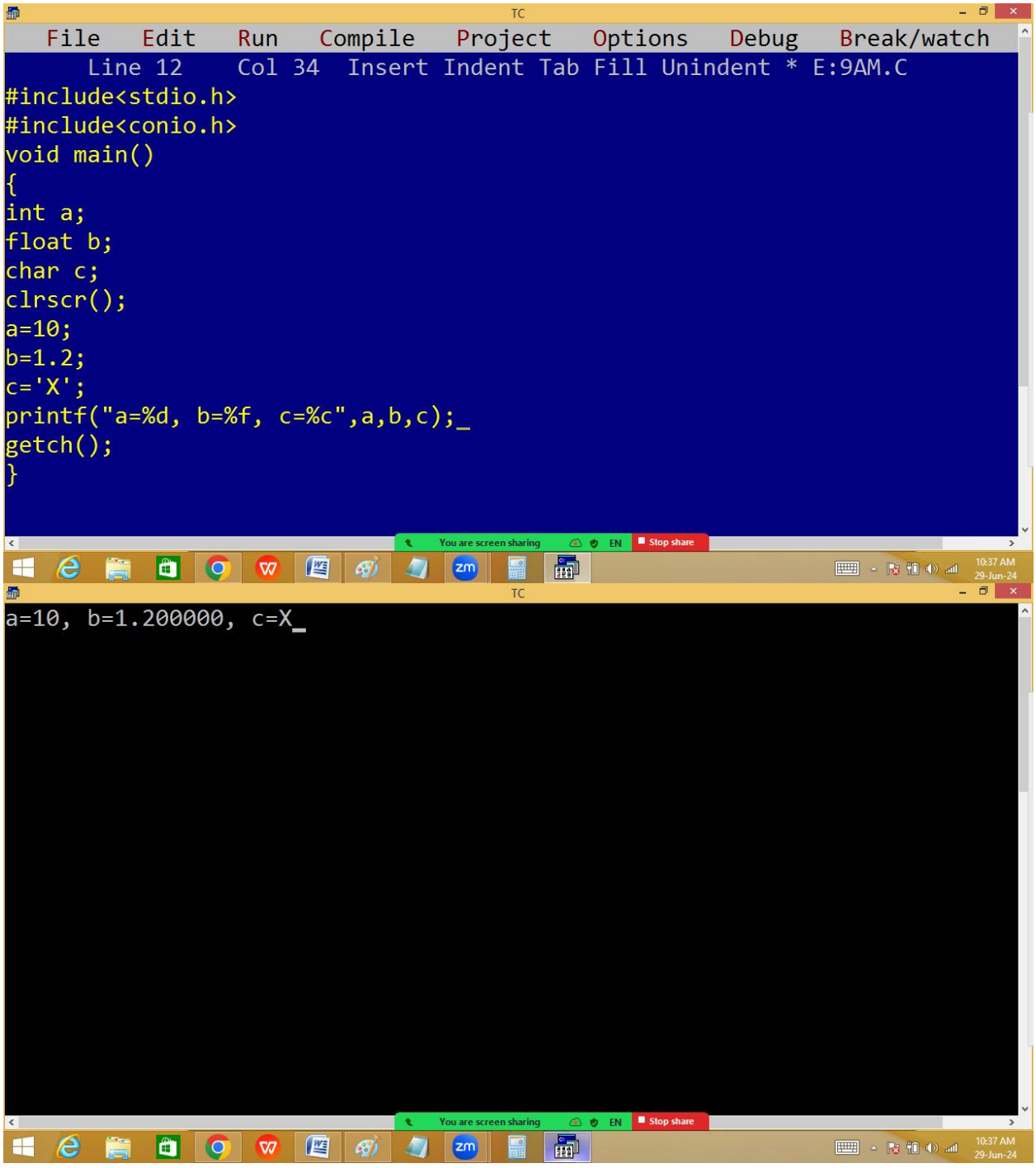
   5>9 ? true : false;

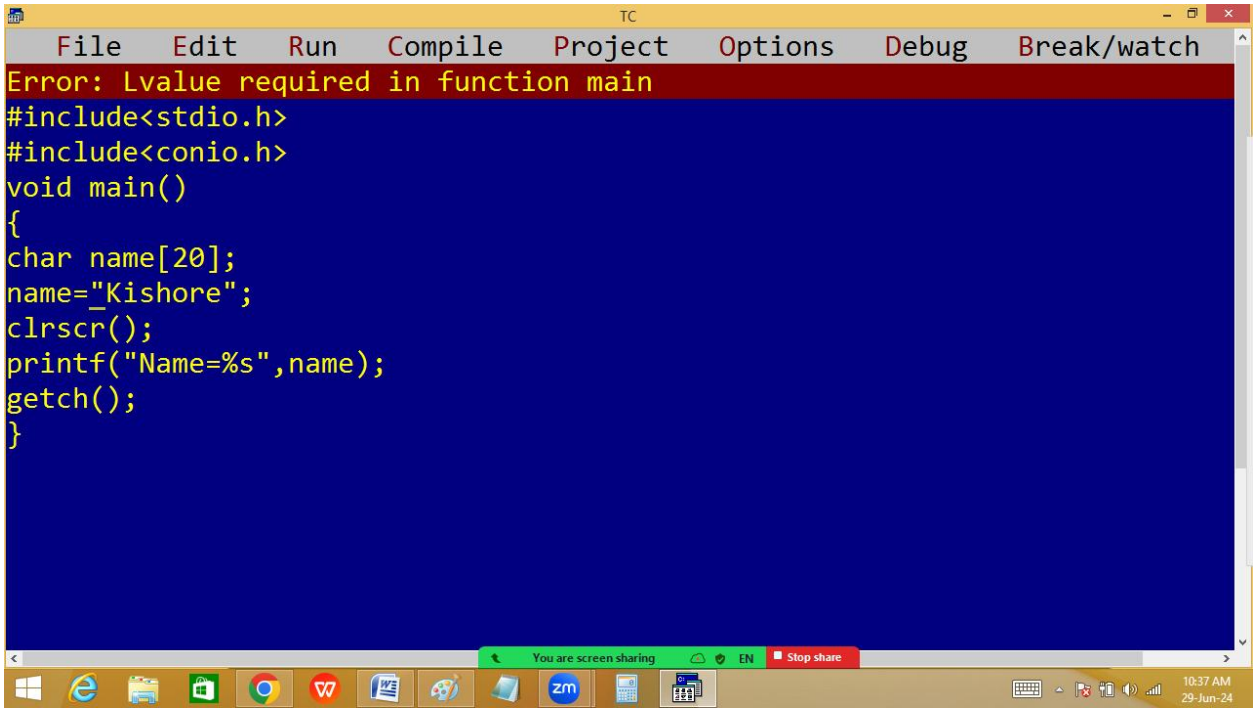
Based on operation, the operators divided into several types.

1. **Assignment operator [=]**: It copies the value on its right side into the variable on its left side. The left side operand should be a variable. i.e. expressions and constant values not allowed on left side.

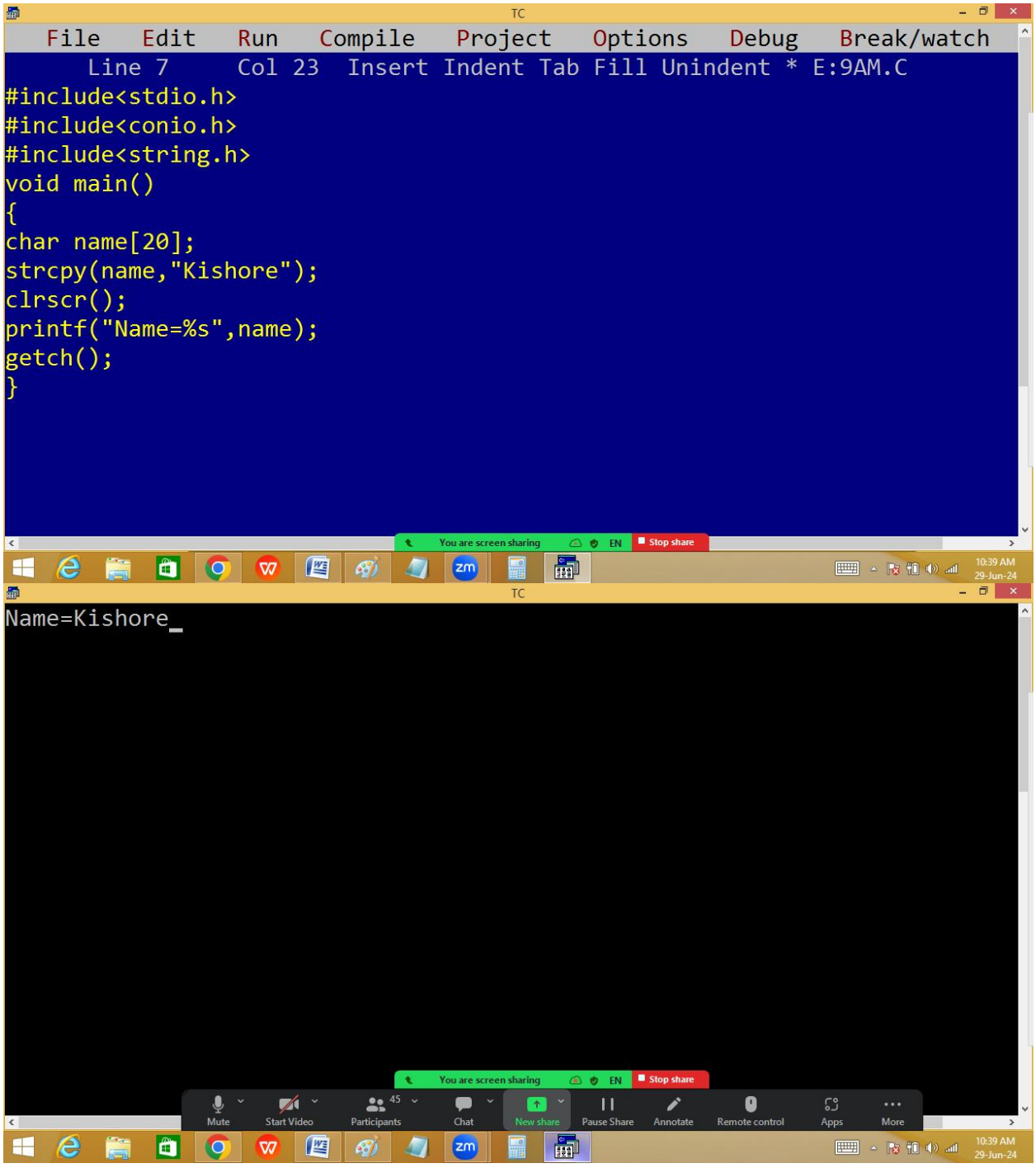
   Eg:
   a=10;
   b=1.2;
   c='X';
   d="abc"; ➔ Error because of abc is a string
   e=f=g=100;

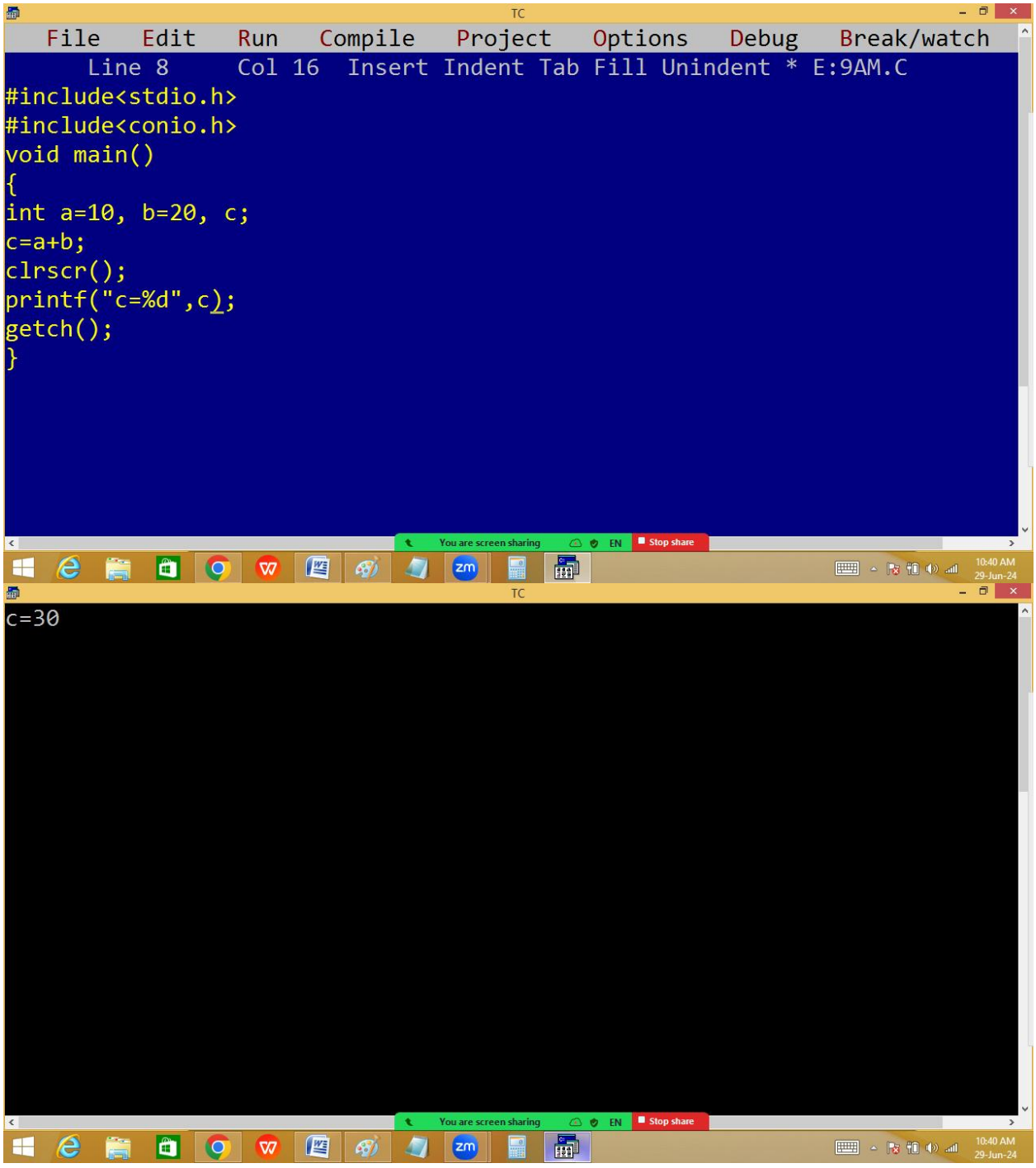
   2+7=10; ➔ Error because of 2+7 is 9 which is a constant
   30=50;
   c = a+b;

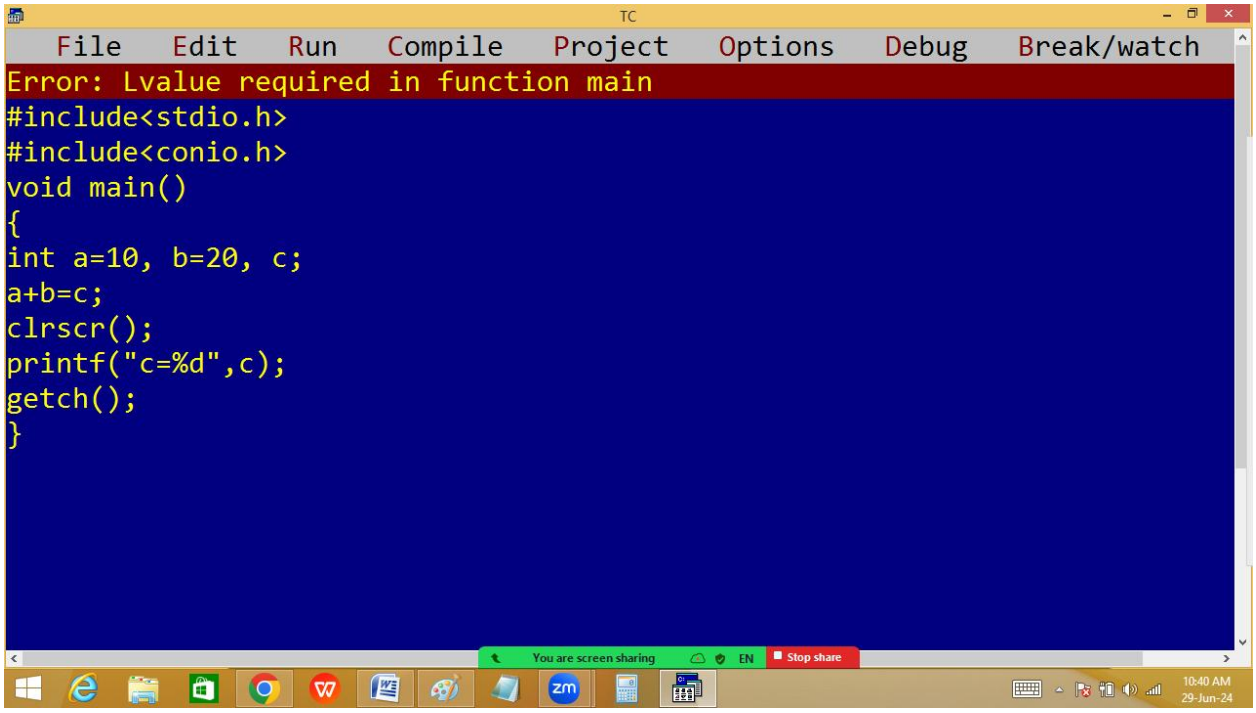

TC
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 34 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
float b;
char c;
clrscr();
a=10;
b=1.2;
c='X';
printf("a=%d, b=%f, c=%c",a,b,c);_
getch();
}
You are screen sharing
EN
Stop share
10:37 AM
29-Jun-24
TC
a=10, b=1.200000, c=X_
You are screen sharing
EN
Stop share
10:37 AM
29-Jun-24



Note:Lvalue error means left side value not changeable.


TC
File Edit Run Compile Project Options Debug Break/watch
Line 7 Col 23 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char name[20];
strcpy(name,"Kishore");
clrscr();
printf("Name=%s",name);
getch();
}
You are screen sharing
EN
Stop share
10:39 AM
29-Jun-24
TC
Name=Kishore
You are screen sharing
EN
Stop share
Mute
Start Video
Participants
45
Chat
New share
Pause Share
Annotate
Remote control
Apps
More
10:39 AM
29-Jun-24


TC
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, b=20, c;
c=a+b;
clrscr();
printf("c=%d",c);
getch();
}
You are screen sharing
EN
Stop share
10:40 AM
29-Jun-24
TC
c=30
You are screen sharing
EN
Stop share
10:40 AM
29-Jun-24


TC
File Edit Run Compile Project Options Debug Break/watch
Error: Lvalue required in function main
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, b=20, c;
a+b=c;
clrscr();
printf("c=%d",c);
getch();
}
You are screen sharing
EN
Stop share
10:40 AM
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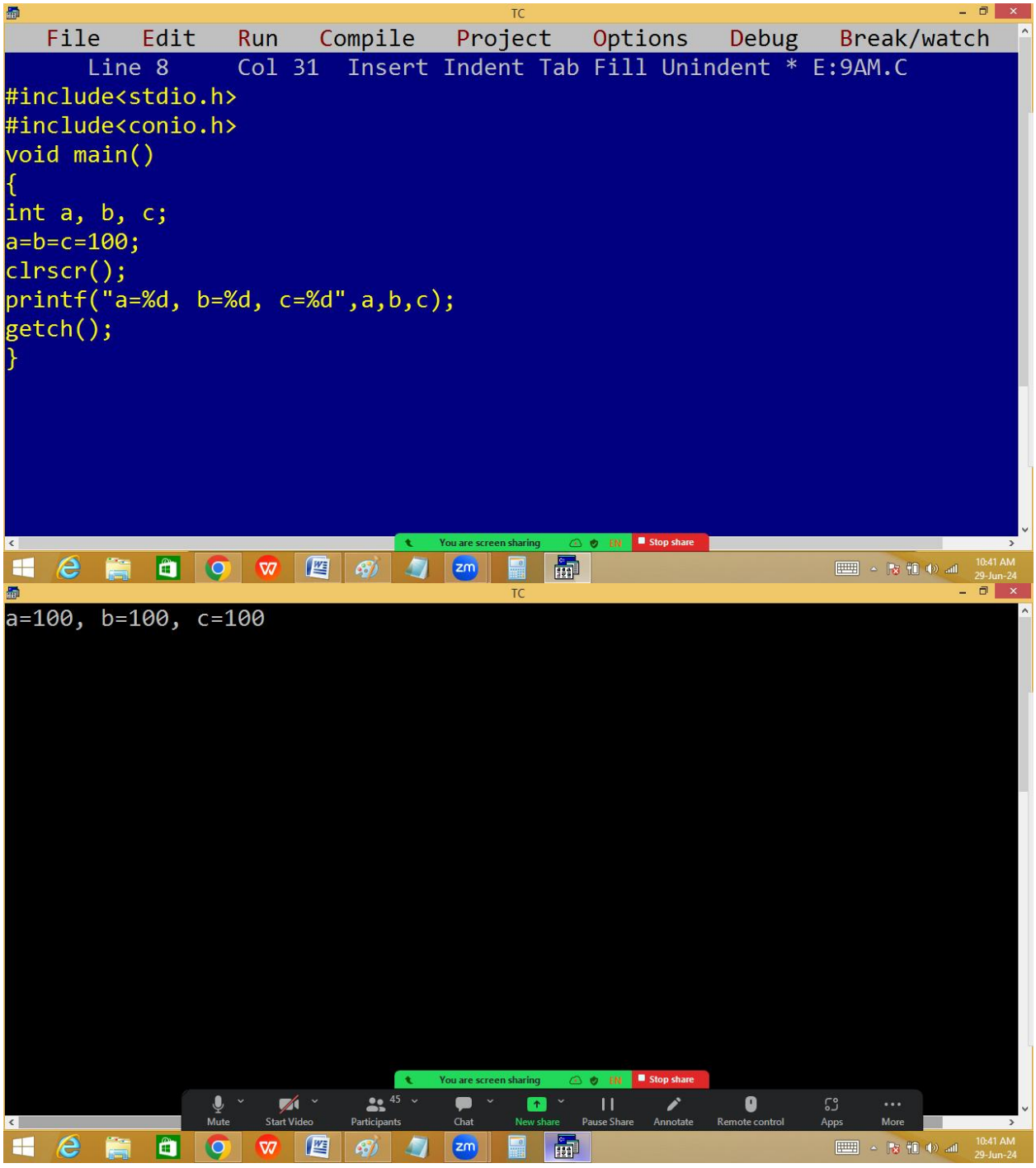
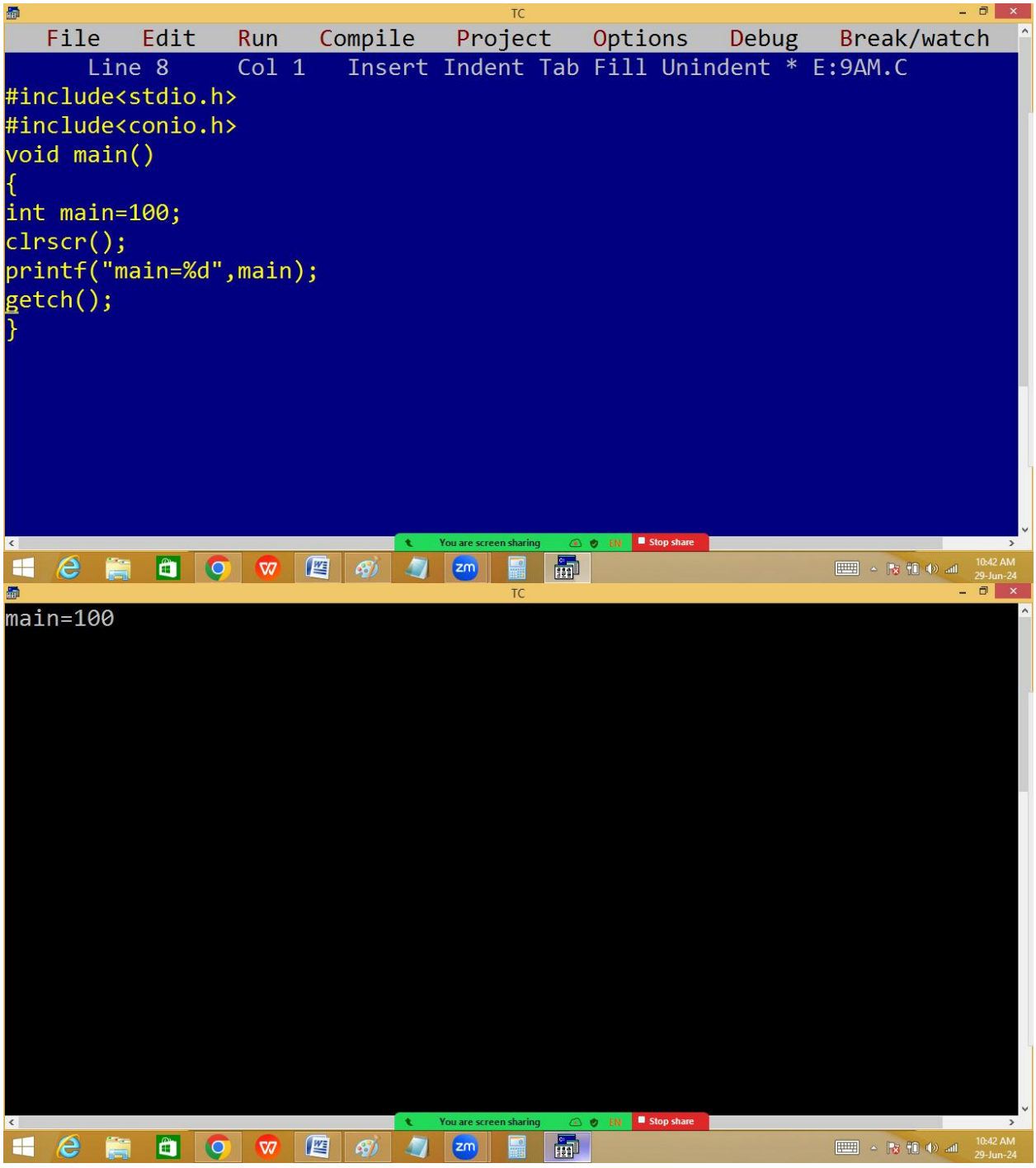

TC
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 31 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a, b, c;
a=b=c=100;
clrscr();
printf("a=%d, b=%d, c=%d",a,b,c);
getch();
}
You are screen sharing
Stop share
TC
a=100, b=100, c=100
You are screen sharing
Stop share
Mute
Start Video
Participants
45
Chat
New share
Pause Share
Annotate
Remote control
Apps
More


TC
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int main=100;
clrscr();
printf("main=%d",main);
getch();
}
You are screen sharing
Stop share
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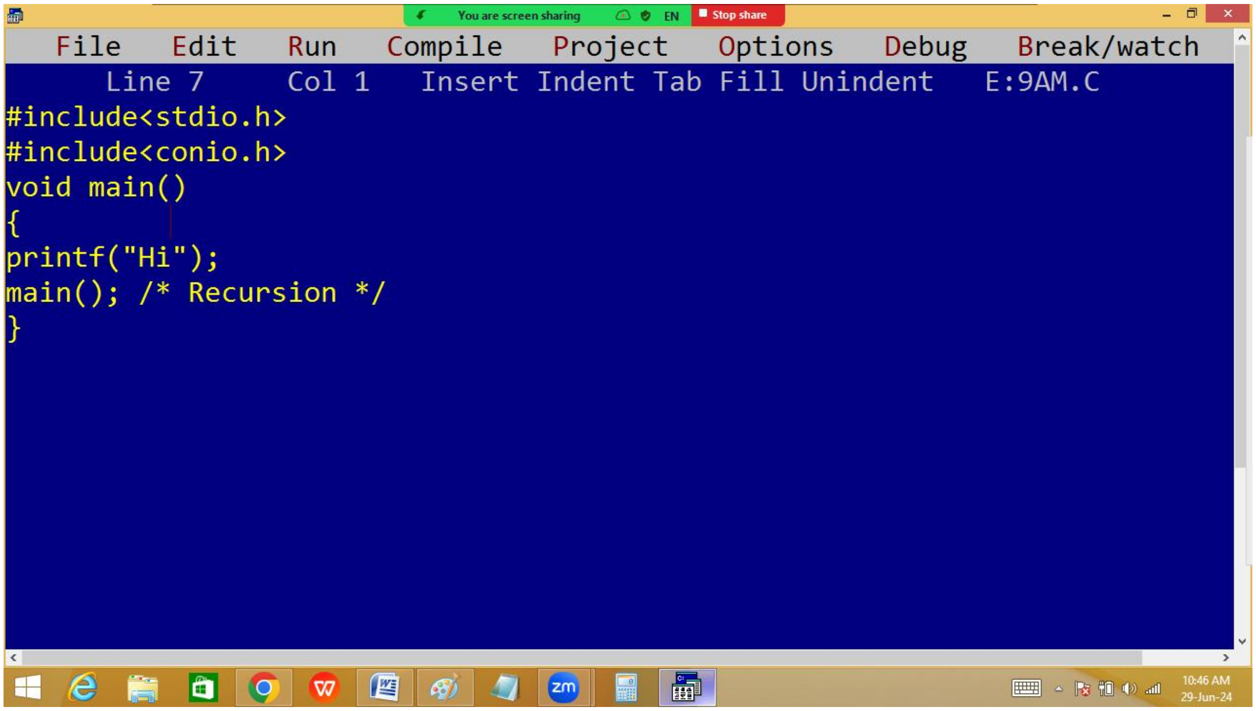
TC
main=100
You are screen sharing
Stop share
10:42 AM
29-Jun-24


You are screen sharing
EN
Stop share
File Edit Run Compile Project Options Debug Break/watch
Line 7 Col 1 Insert Indent Tab Fill Unindent E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
printf("Hi");
main(); /* Recursion */
}
10:46 AM
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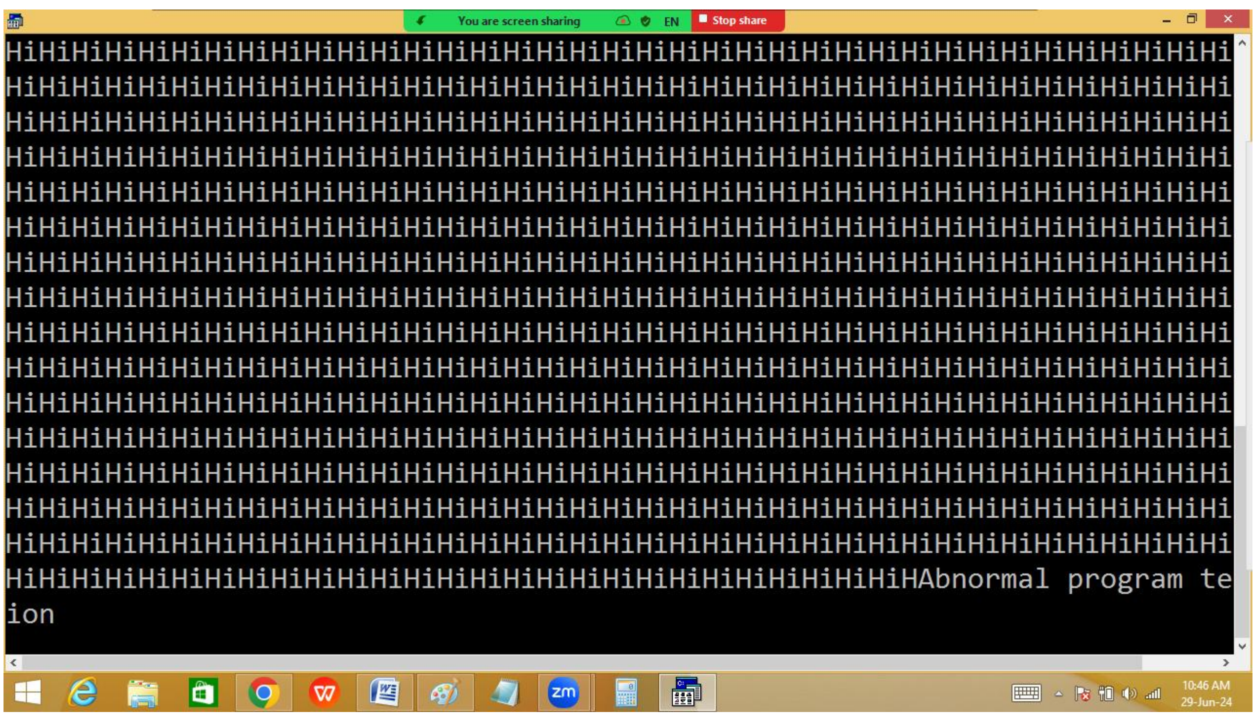
You are screen sharing
EN
Stop share
HiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHiHi
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