VARIABLES

Variable is a container is used to store the values.

Variable is a named memory location where we can store and manipulate [modify] the values.

In C we should have to declare the variables at the first line of any function. In C++ we can declare anywhere.

Always the variables are stored in primary memory i.e. RAM Only. Due to this when the program execution completed, automatically the variables deleted.

Every variable having 2 stages.

1. **Variable declaration / declared**
   Eg: int a;
2. **Variable initialization / defined**
   Eg: a=100;

When a variable is defined then only memory allocated.

Variables are case sensitive i.e. lower and upper are different.

```
int a=10;

int A=20;
```

Syntax:

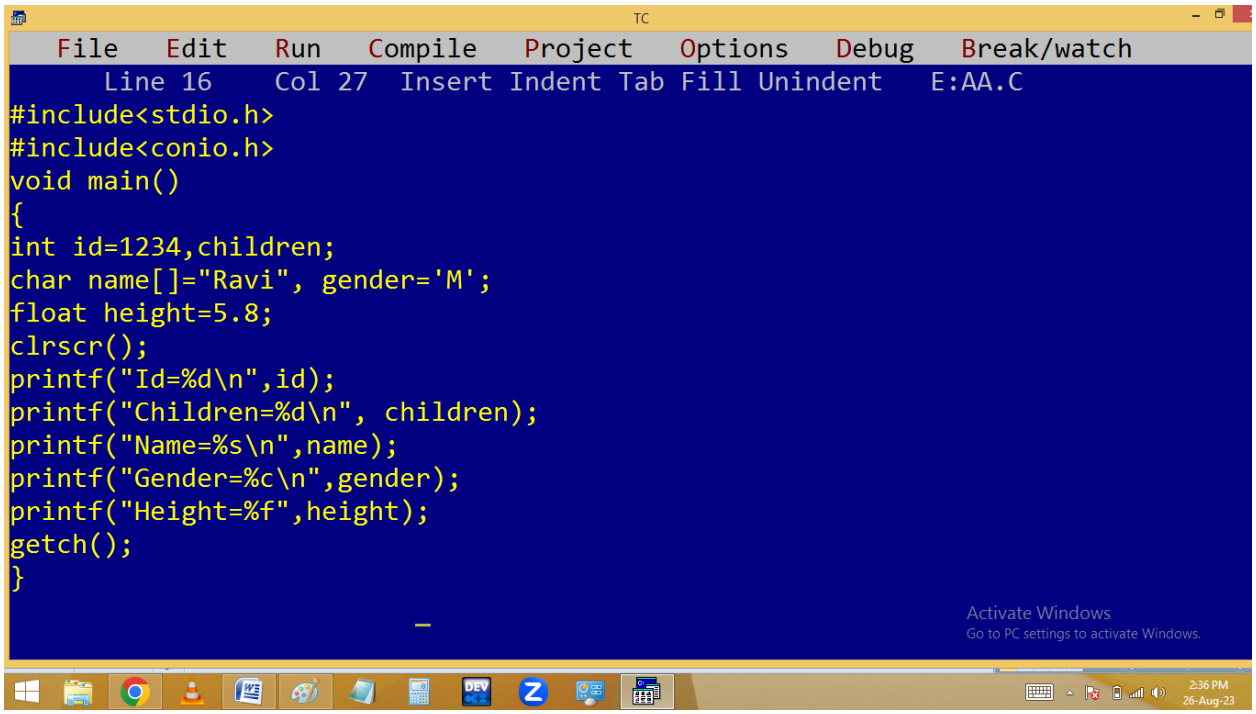
```
datatype variable[=value], variable[=value],…..;
```

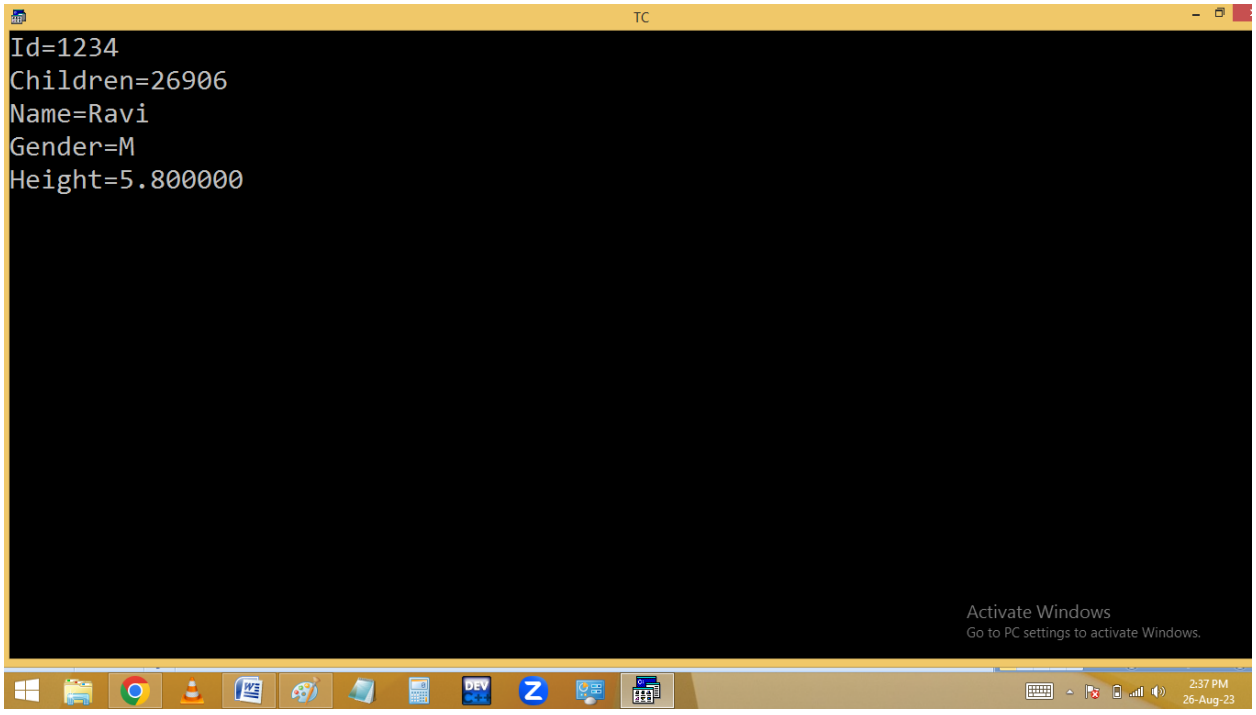
Eg:

int id=1234, children=2;

char name[]=”Ravi”, gender=’M’;

float height=5.8;





Memory allocation for variables:

4 bits = 1 nibble

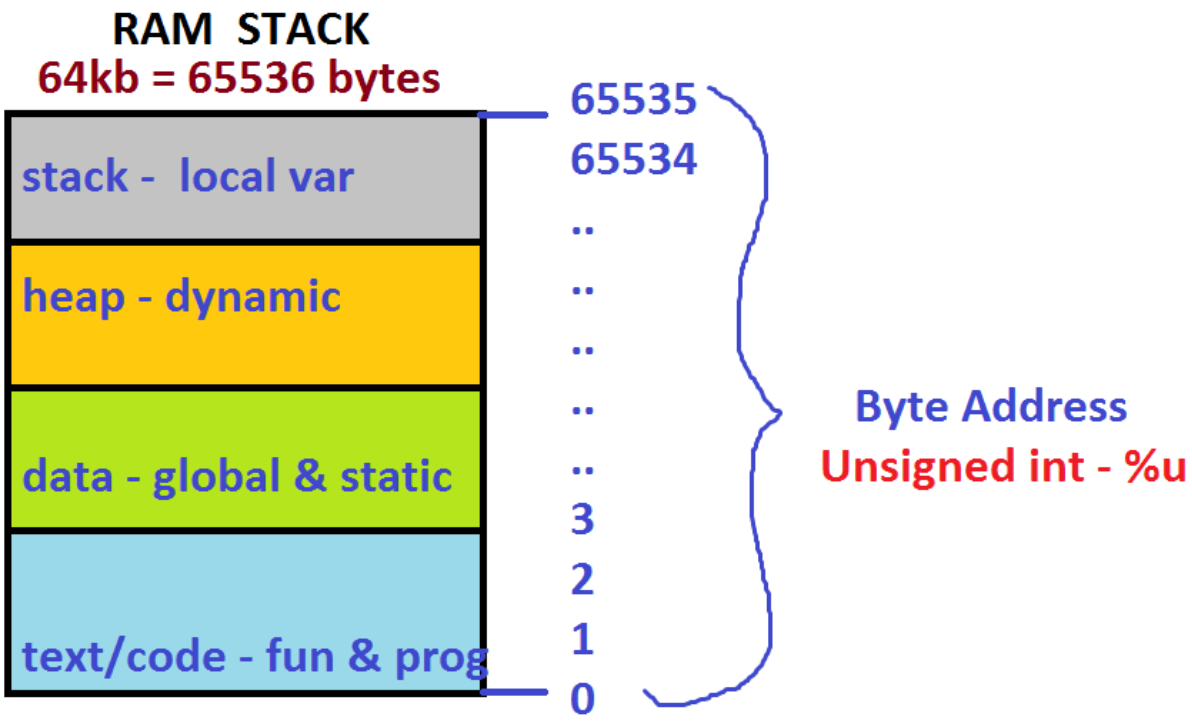
2 nibbles / 8 bits = 1 byte

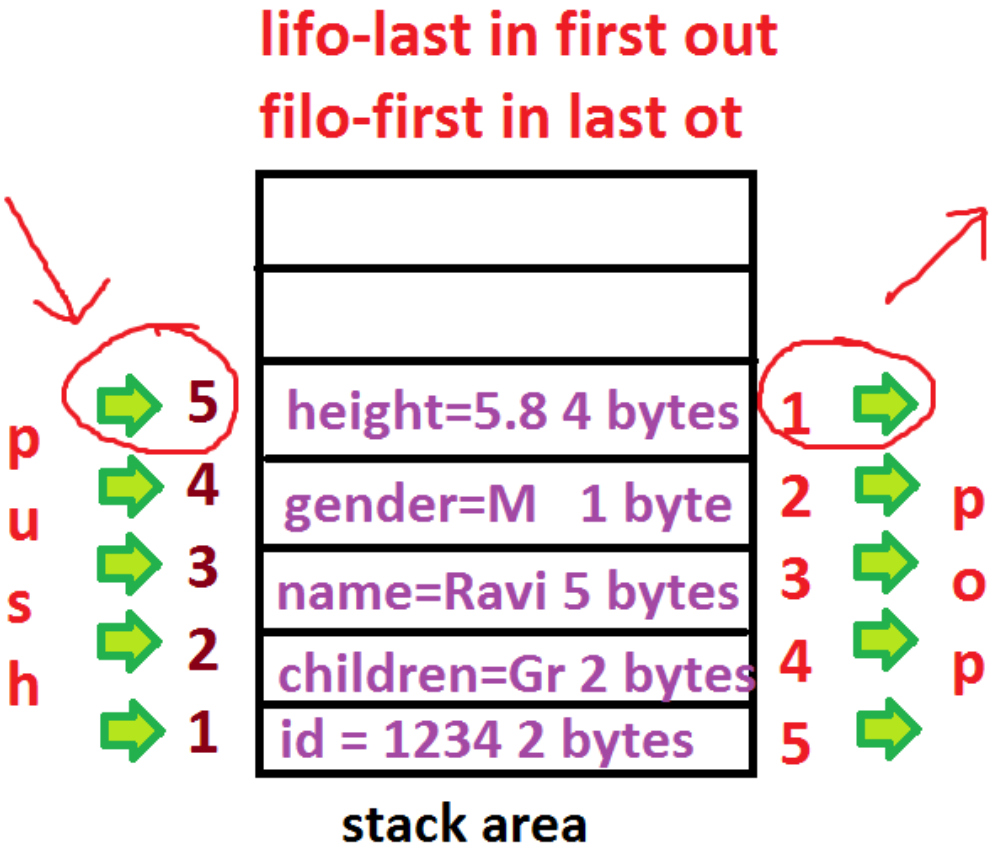
1024 bytes = 1kb

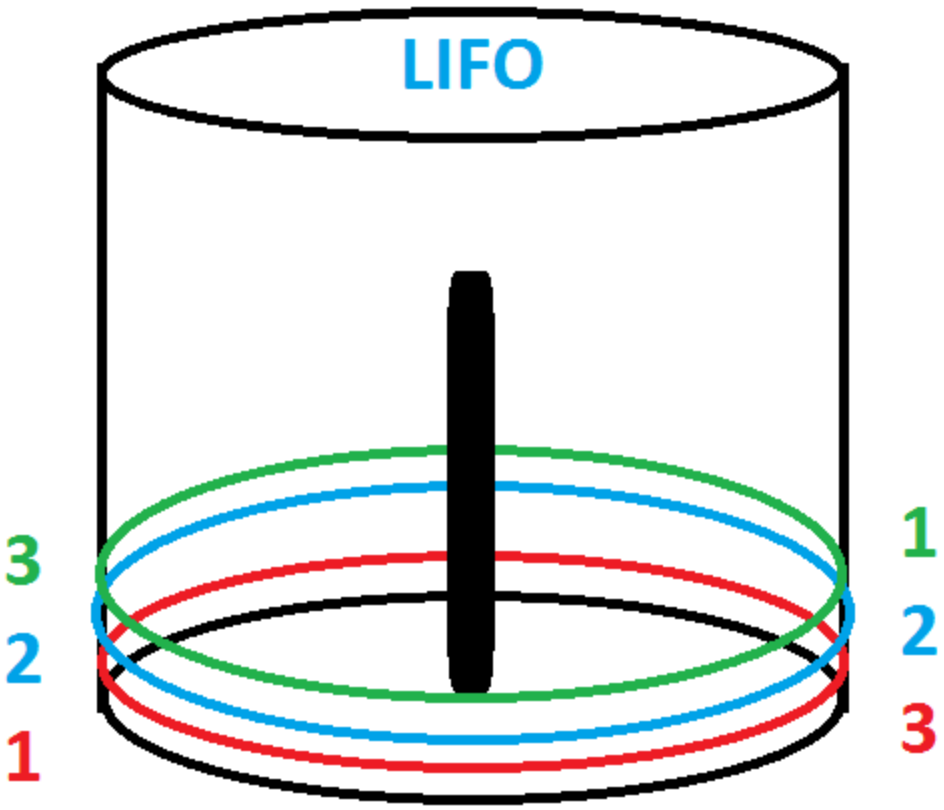
1024kb=1mb

1023mb=1gb

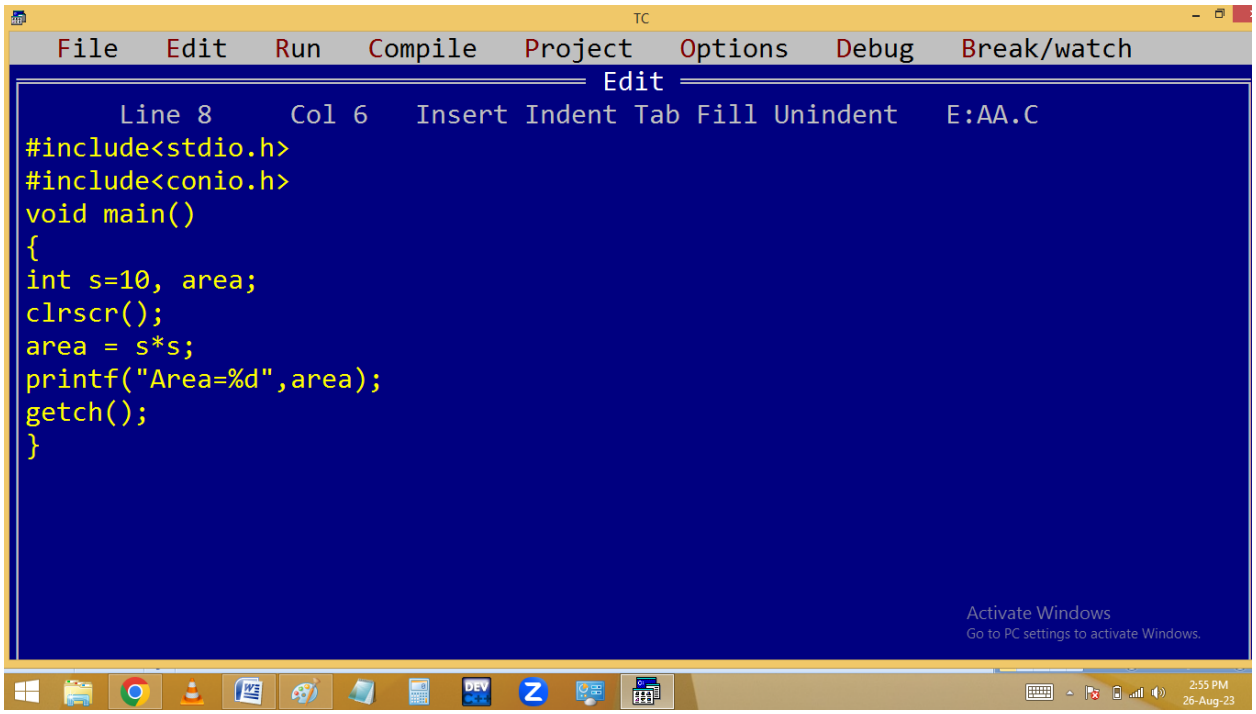
1024gb=1tb

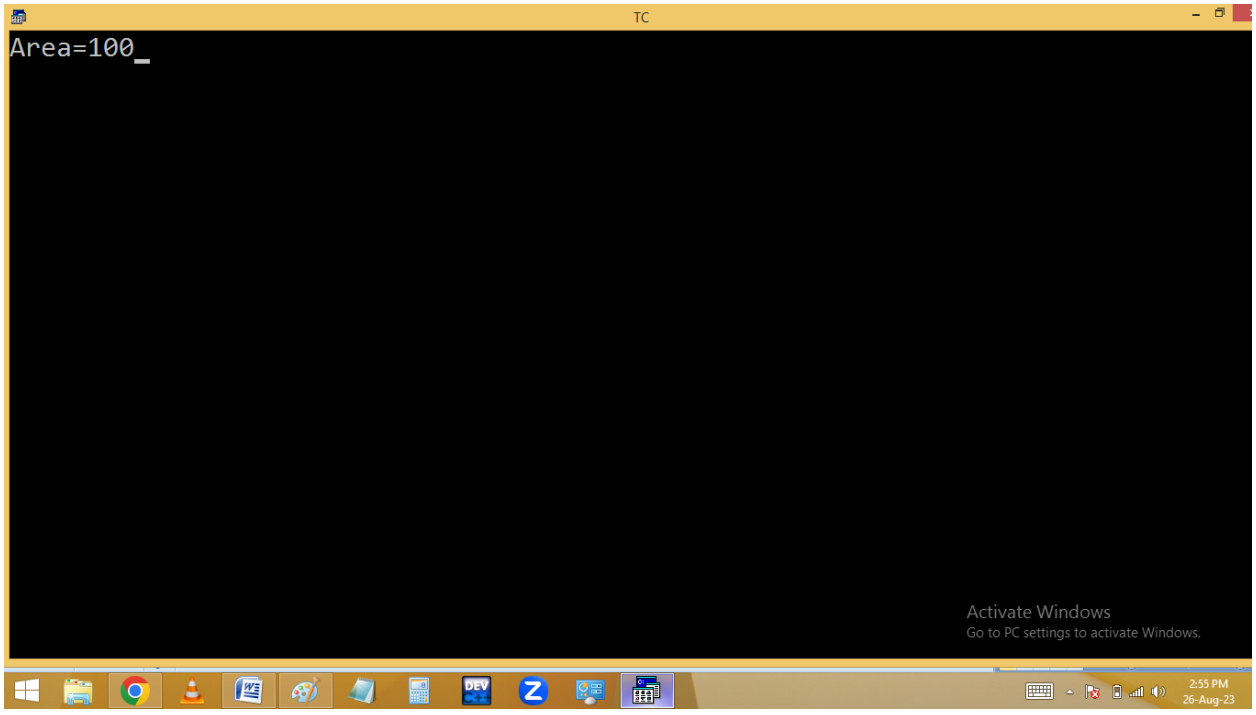


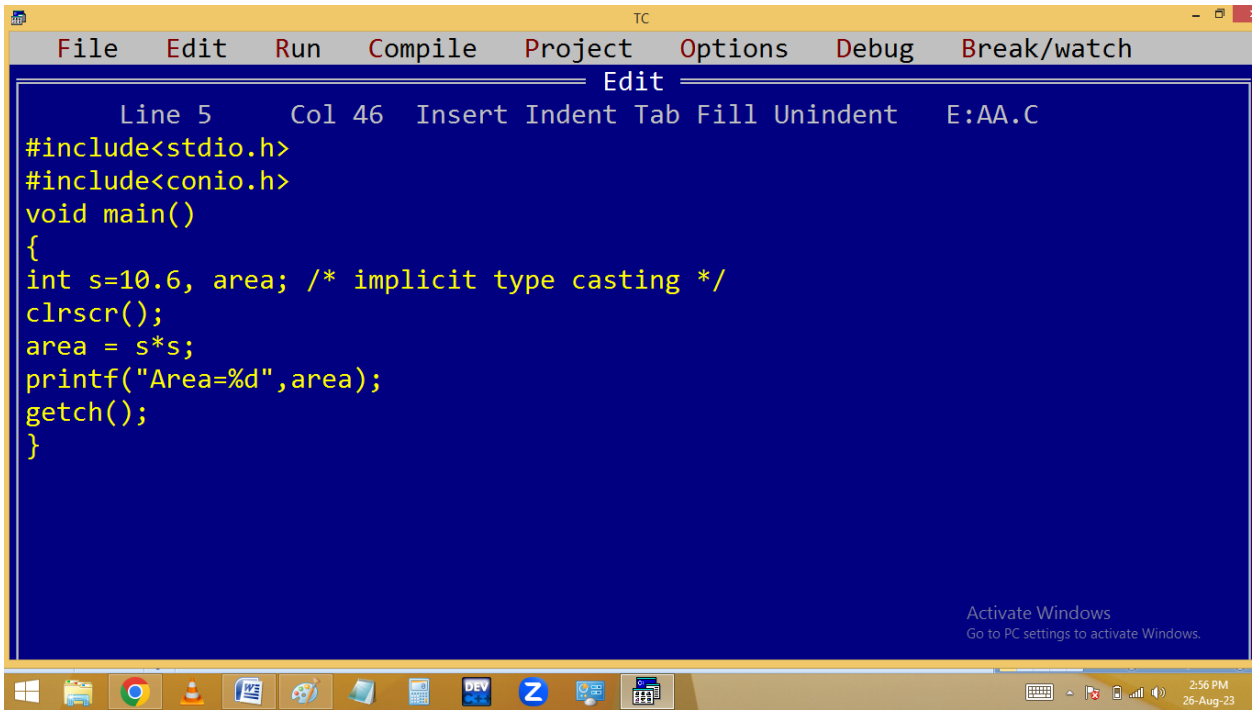

lifo-last in first out
filo-first in last ot
push
5
4
3
2
1
height=5.8 4 bytes
gender=M 1 byte
name=Ravi 5 bytes
children=Gr 2 bytes
id = 1234 2 bytes
1
2
3
4
5
pop
stack area

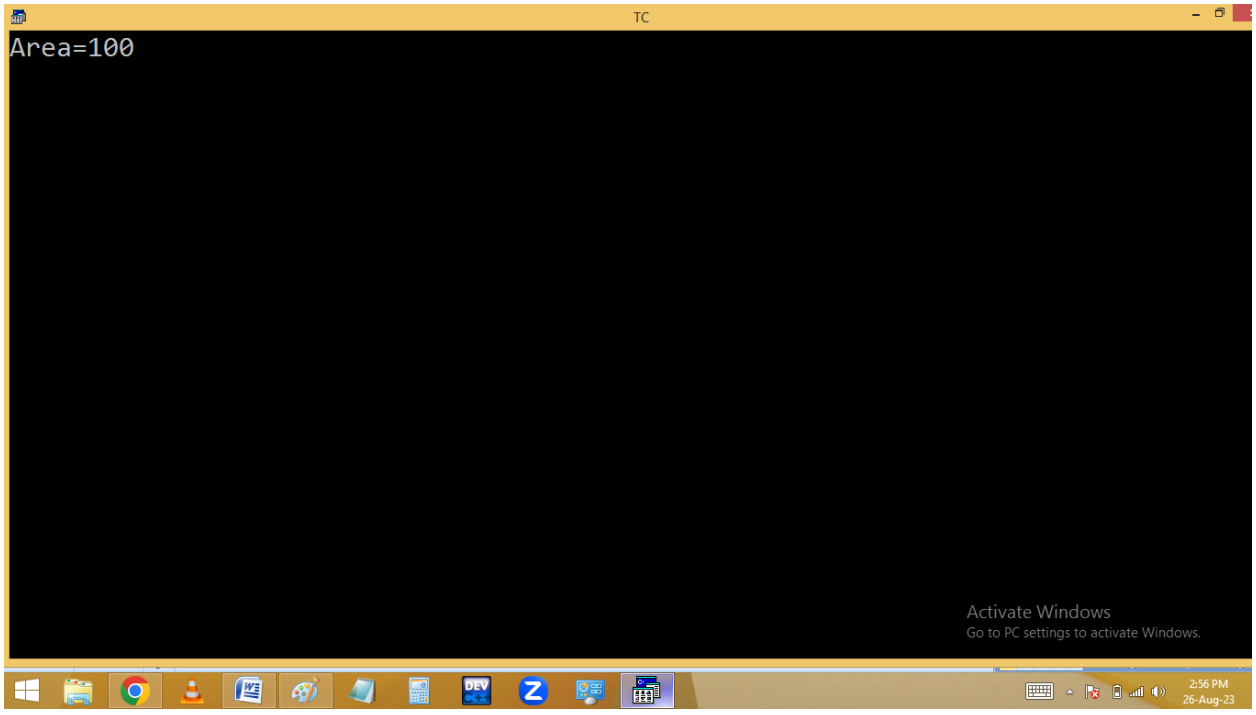


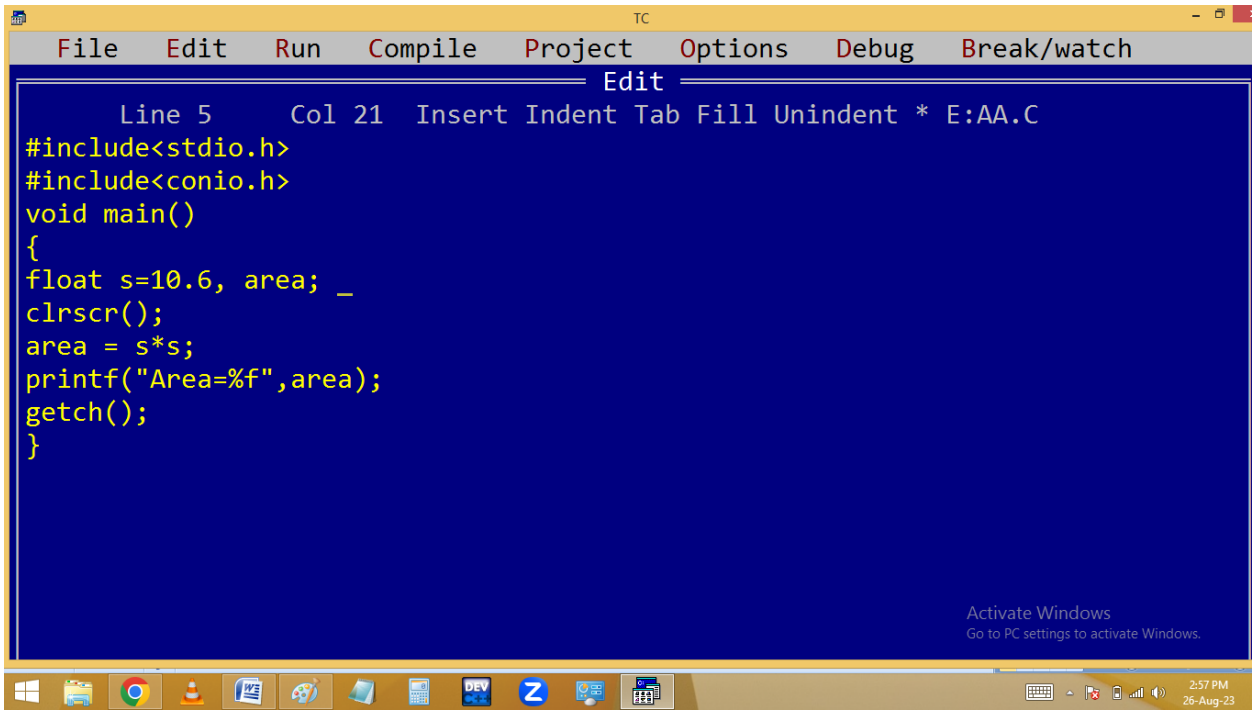
Finding square area:

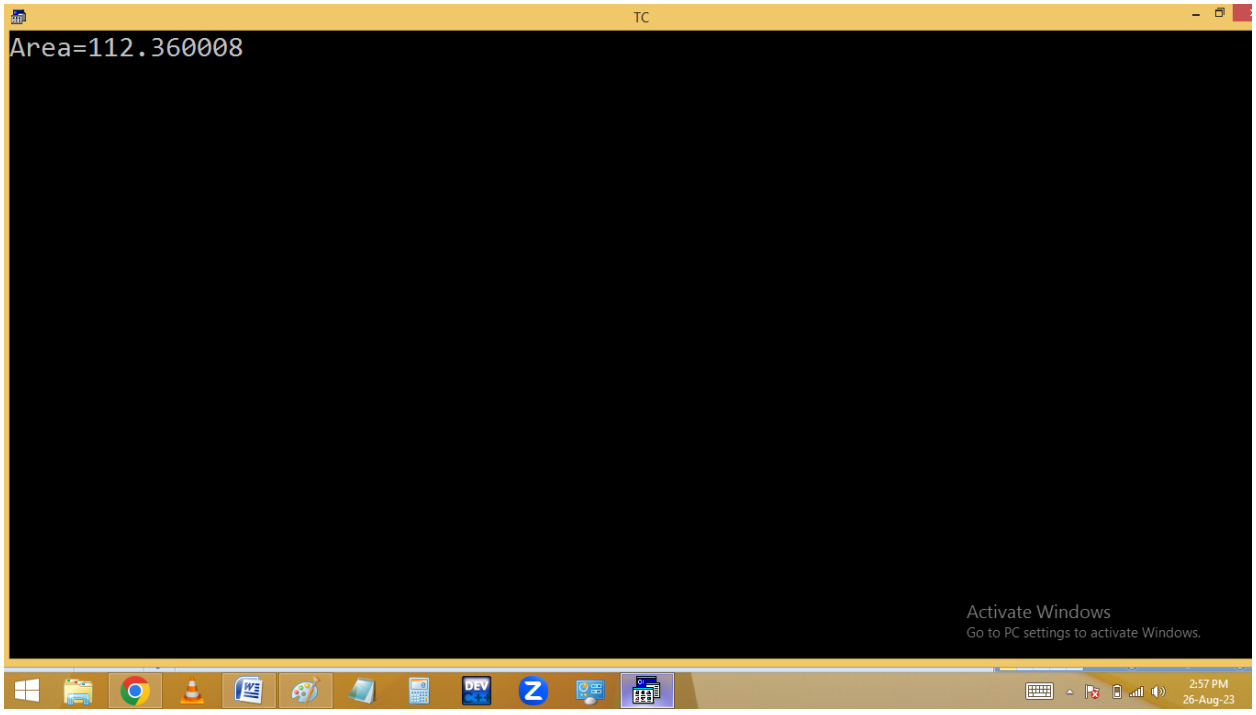

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 8 Col 6 Insert Indent Tab Fill Unindent E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int s=10, area;
clrscr();
area = s*s;
printf("Area=%d",area);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
2:55 PM
26-Aug-23

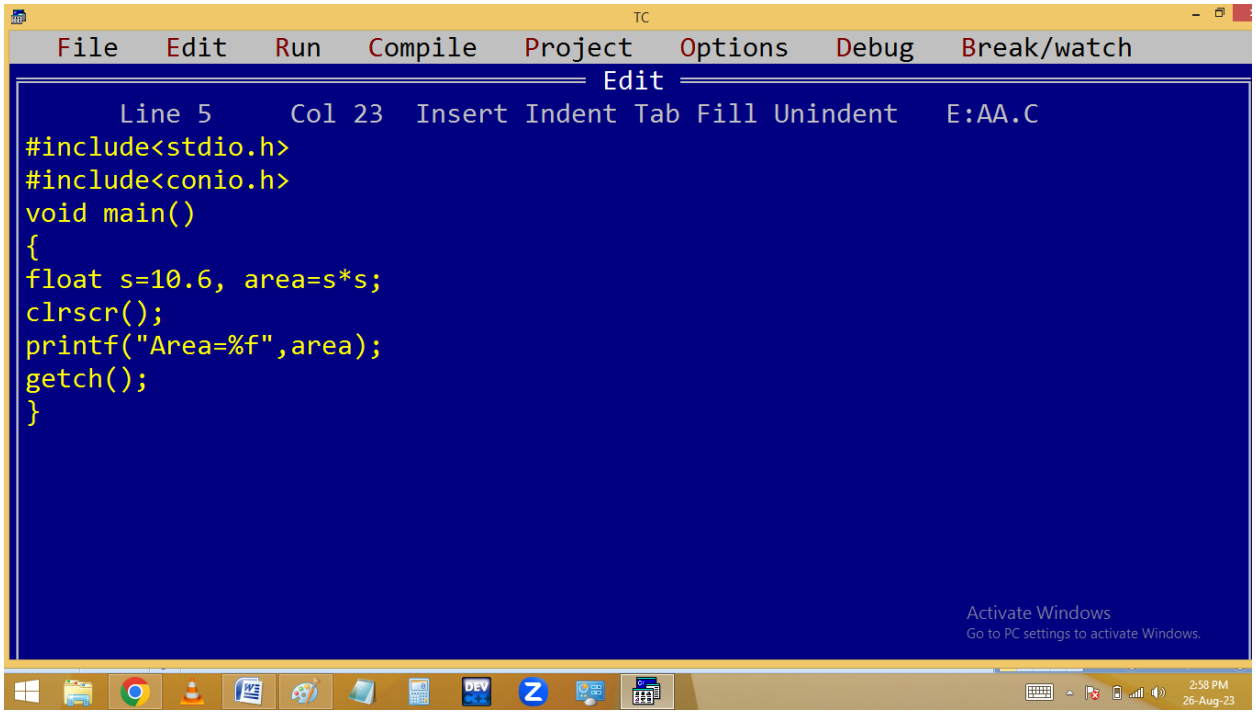

TC
Area=100
Activate Windows
Go to PC settings to activate Windows.
2:55 PM
26-Aug-23


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 5 Col 46 Insert Indent Tab Fill Unindent E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int s=10.6, area; /* implicit type casting */
clrscr();
area = s*s;
printf("Area=%d",area);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
2:56 PM
26-Aug-23

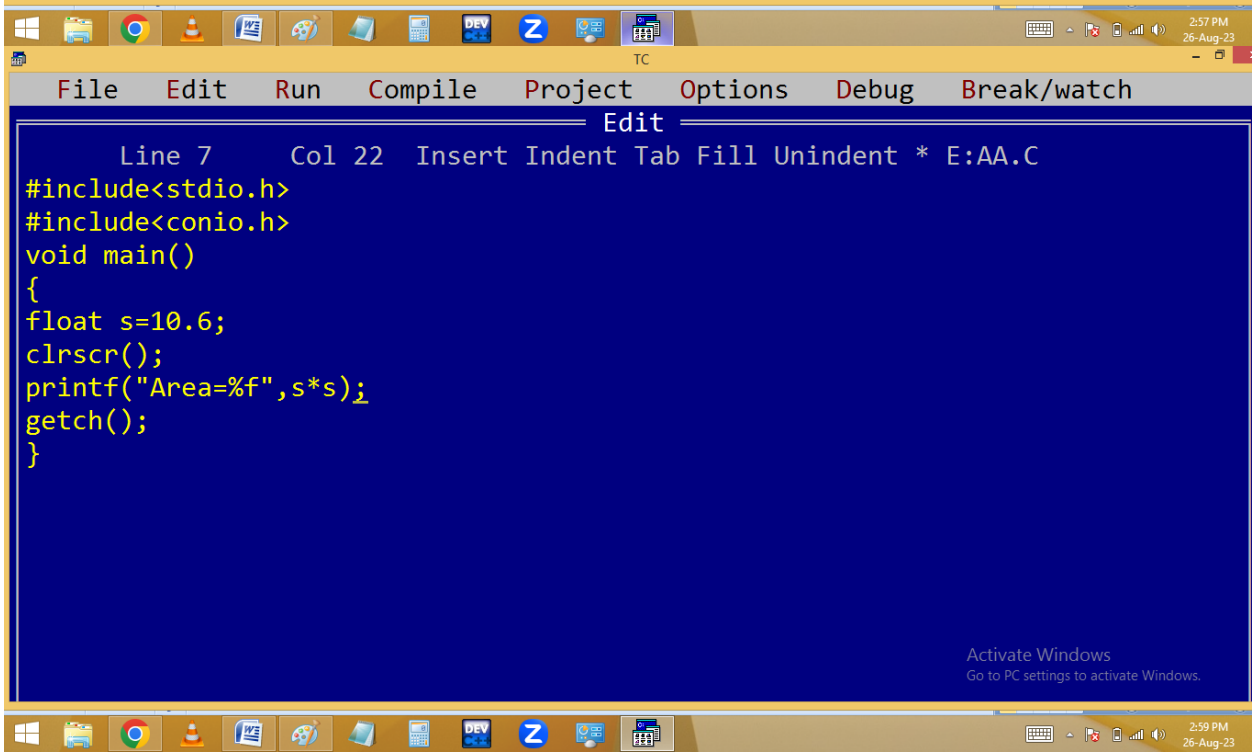

TC
Area=100
Activate Windows
Go to PC settings to activate Windows.
2:56 PM
26-Aug-23

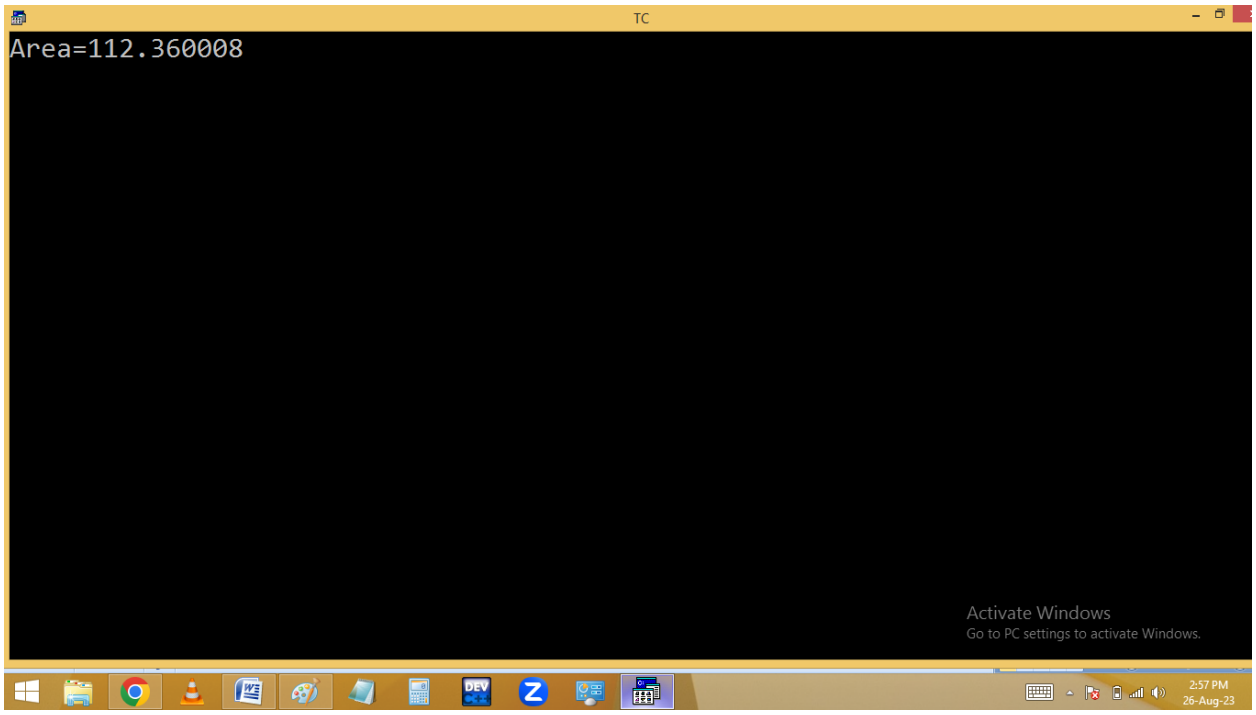

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 5 Col 21 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
float s=10.6, area; _
clrscr();
area = s*s;
printf("Area=%f",area);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
2:57 PM
26-Aug-23


TC
Area=112.360008
Activate Windows
Go to PC settings to activate Windows.
2:57 PM
26-Aug-23

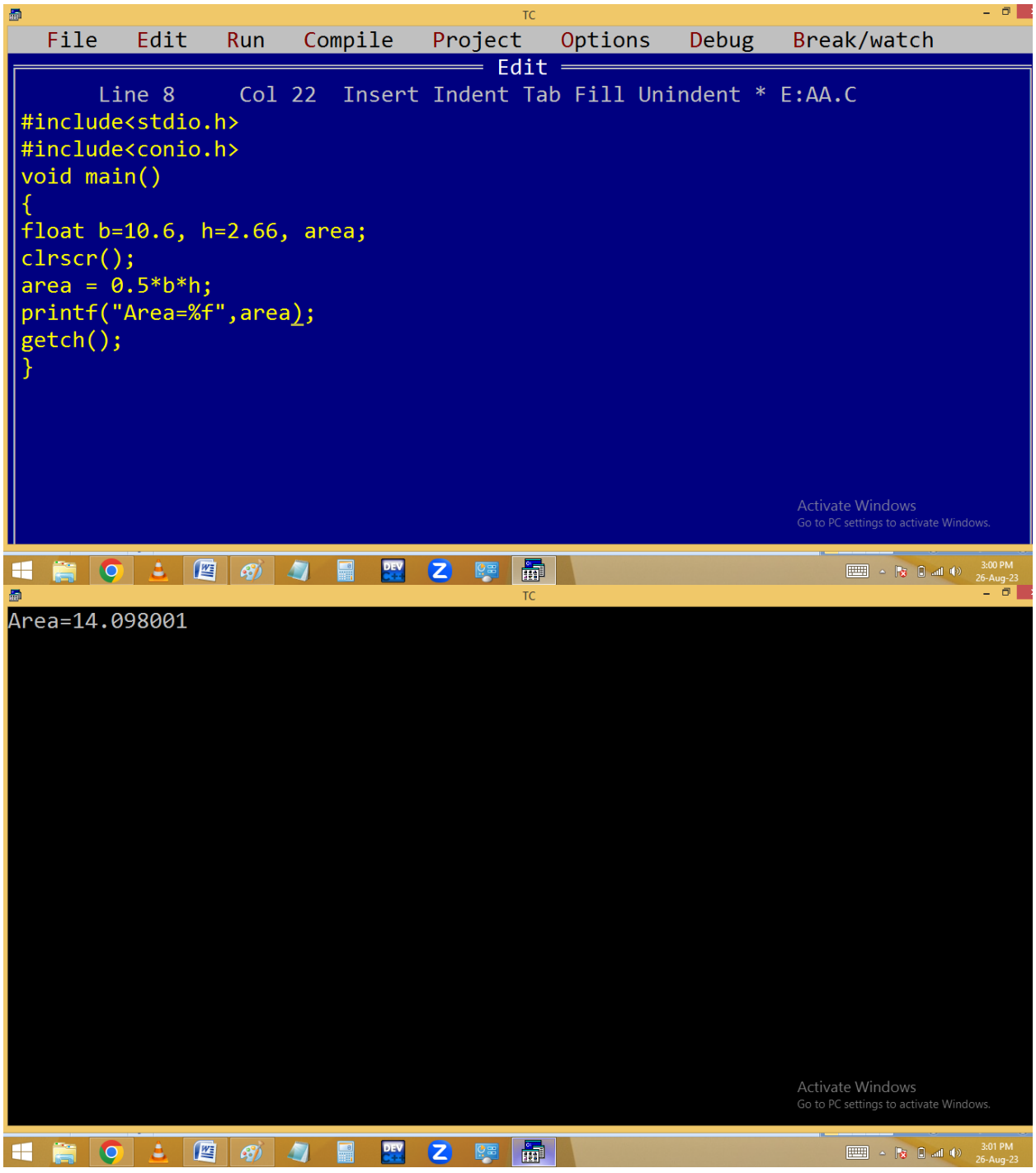

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 5 Col 23 Insert Indent Tab Fill Unindent E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
float s=10.6, area=s*s;
clrscr();
printf("Area=%f",area);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
2:58 PM
26-Aug-23


TC
Area=112.360008
Activate Windows
Go to PC settings to activate Windows.


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 7 Col 22 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
float s=10.6;
clrscr();
printf("Area=%f",s*s);
getch();
}
Activate Windows
Go to PC settings to activate Windows.

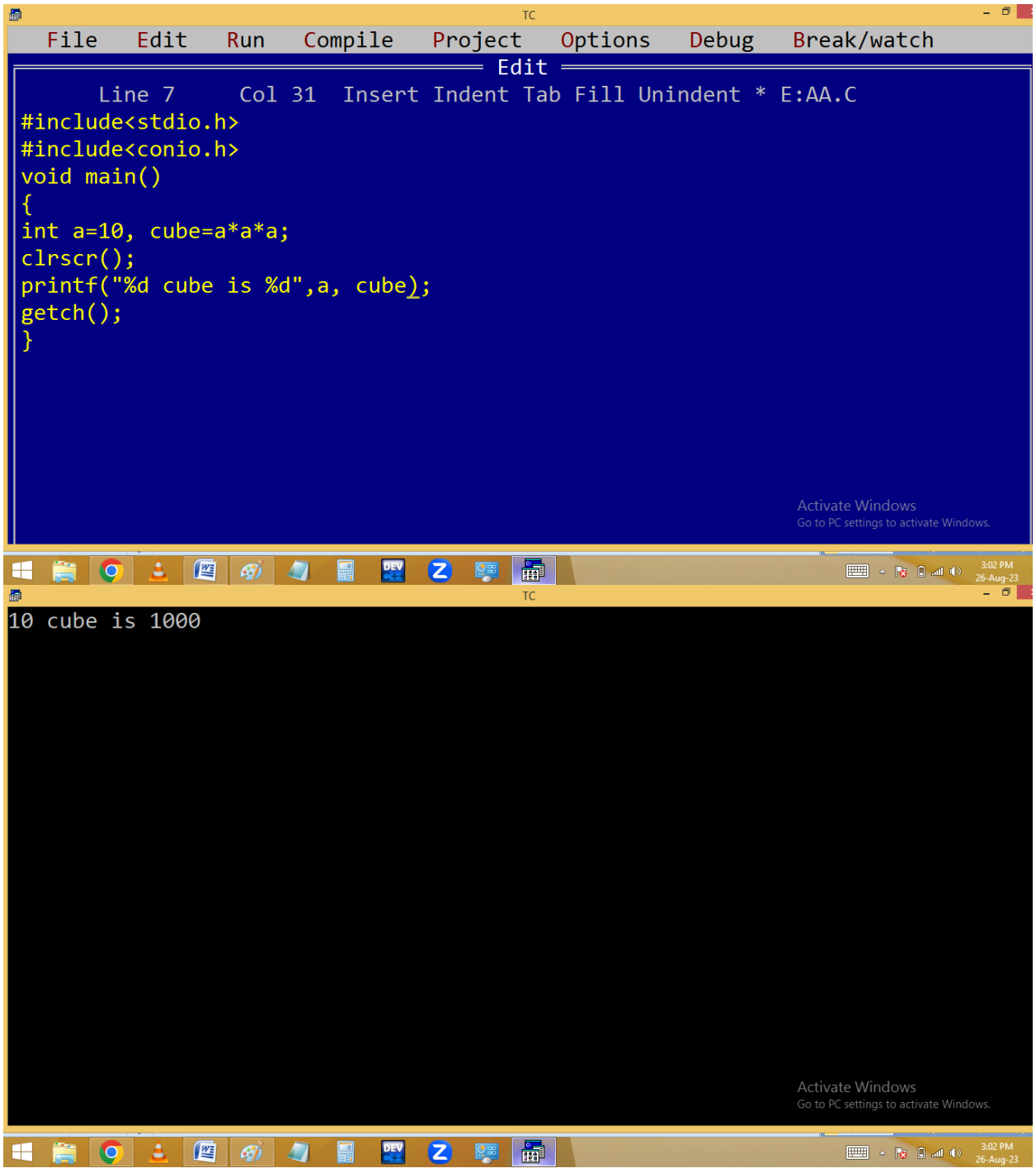


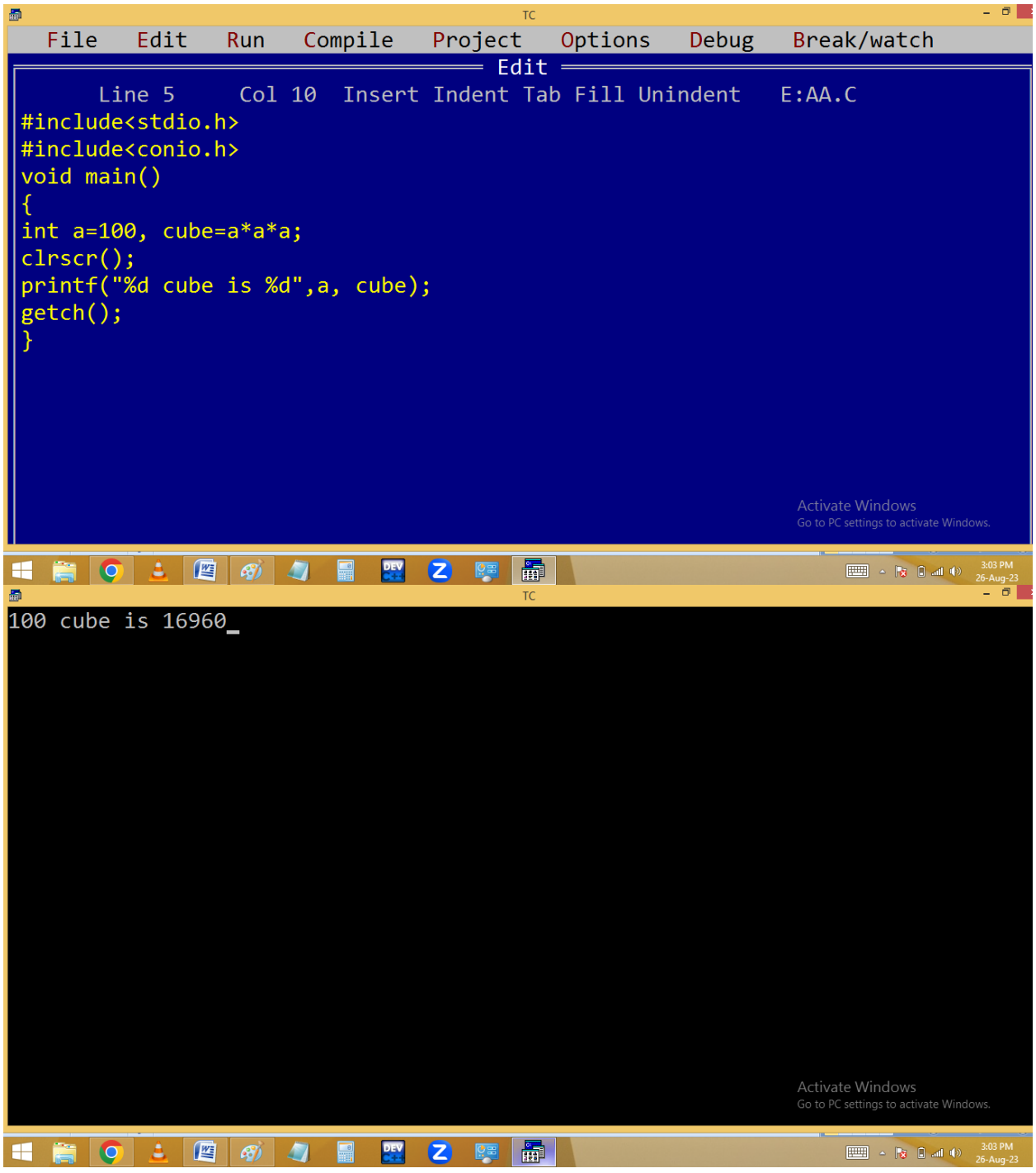
Finding area of a triangle:

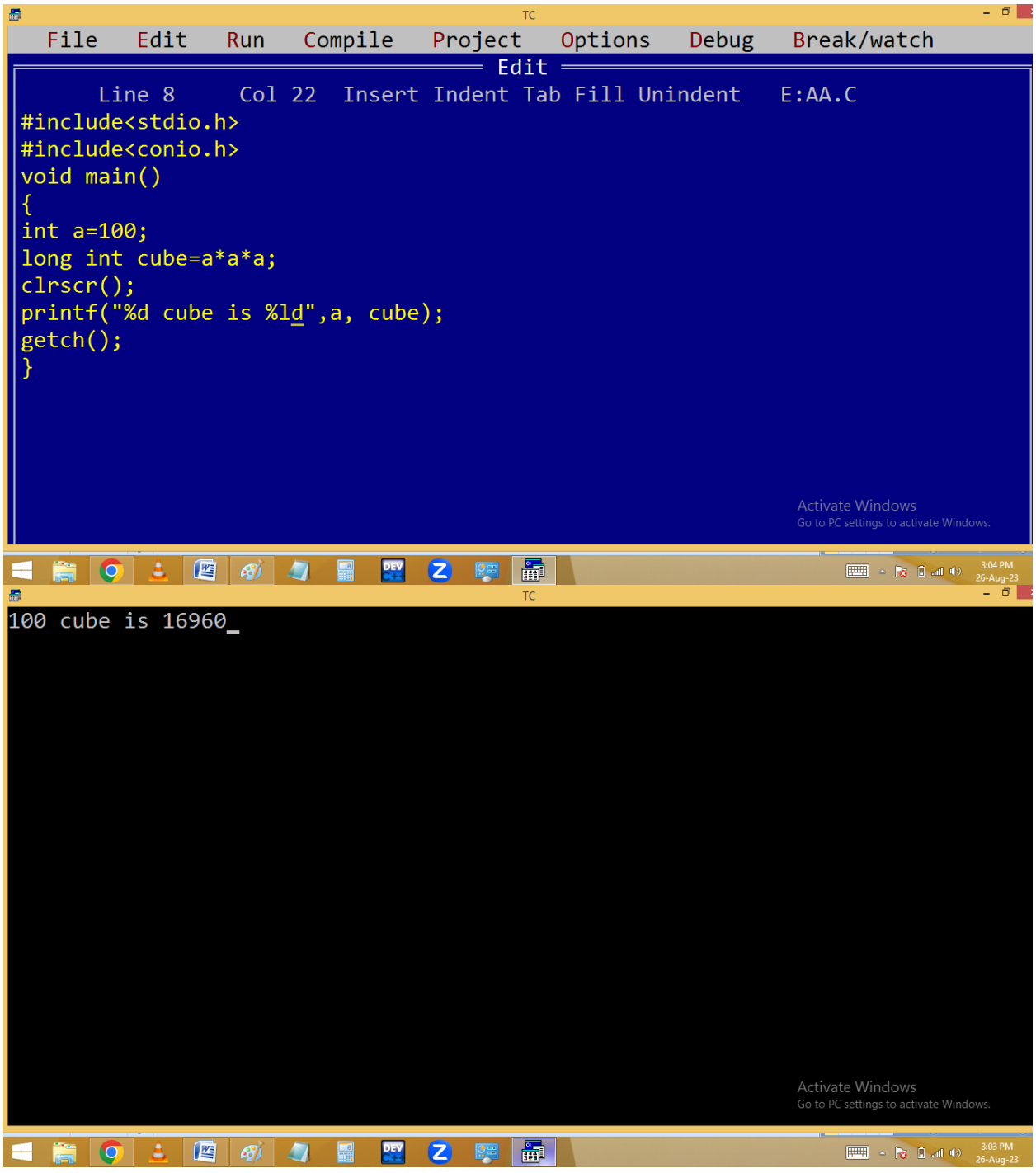


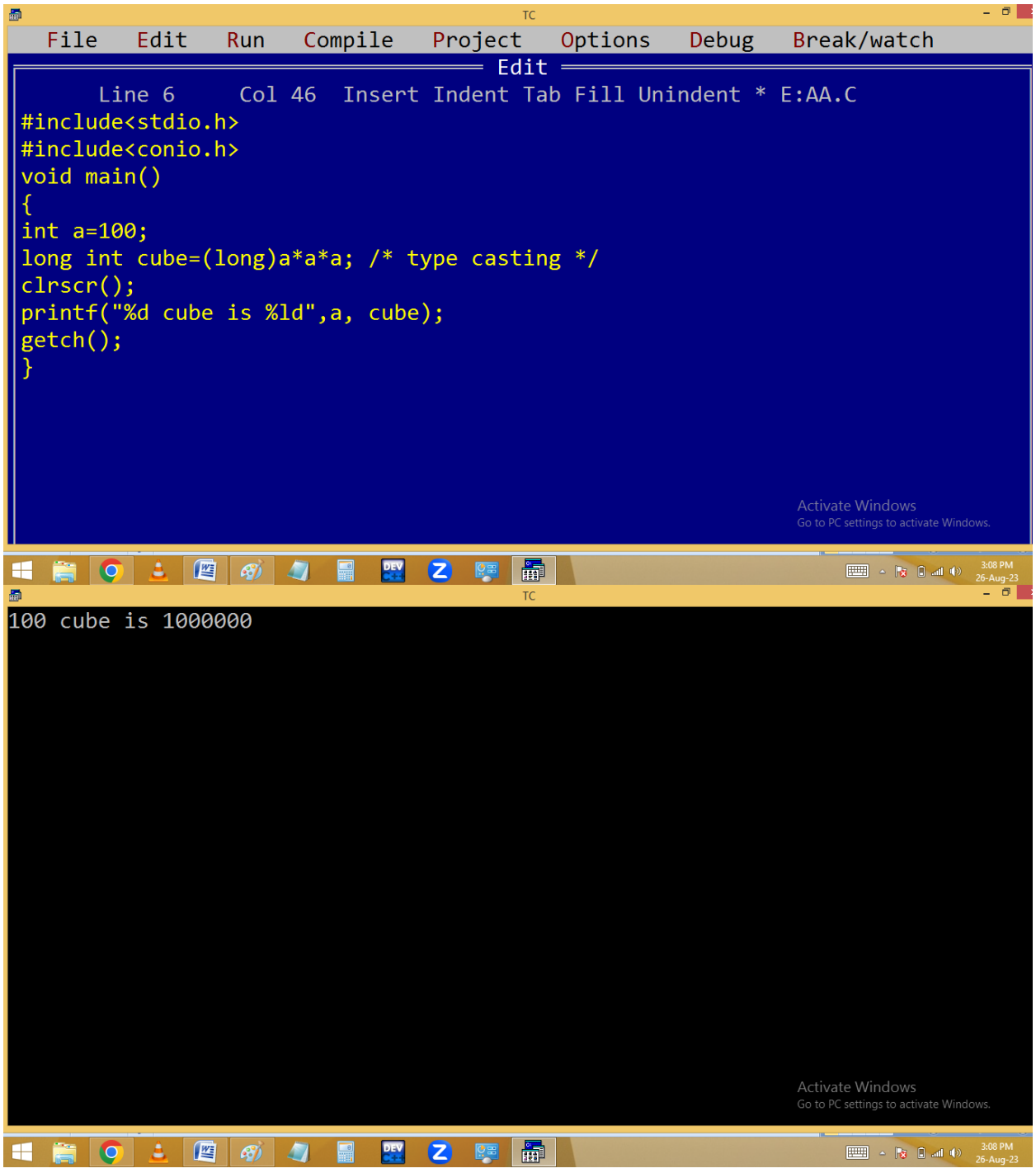
Finding cube value:

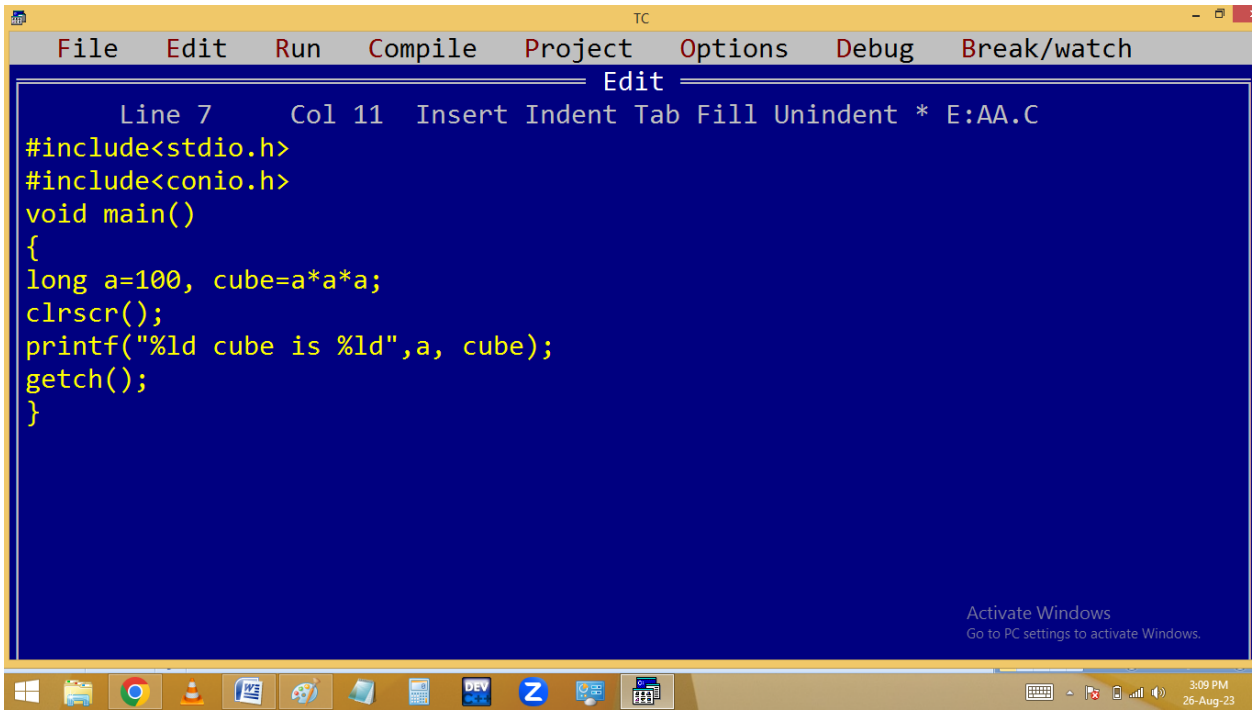
a cube is a*a*a

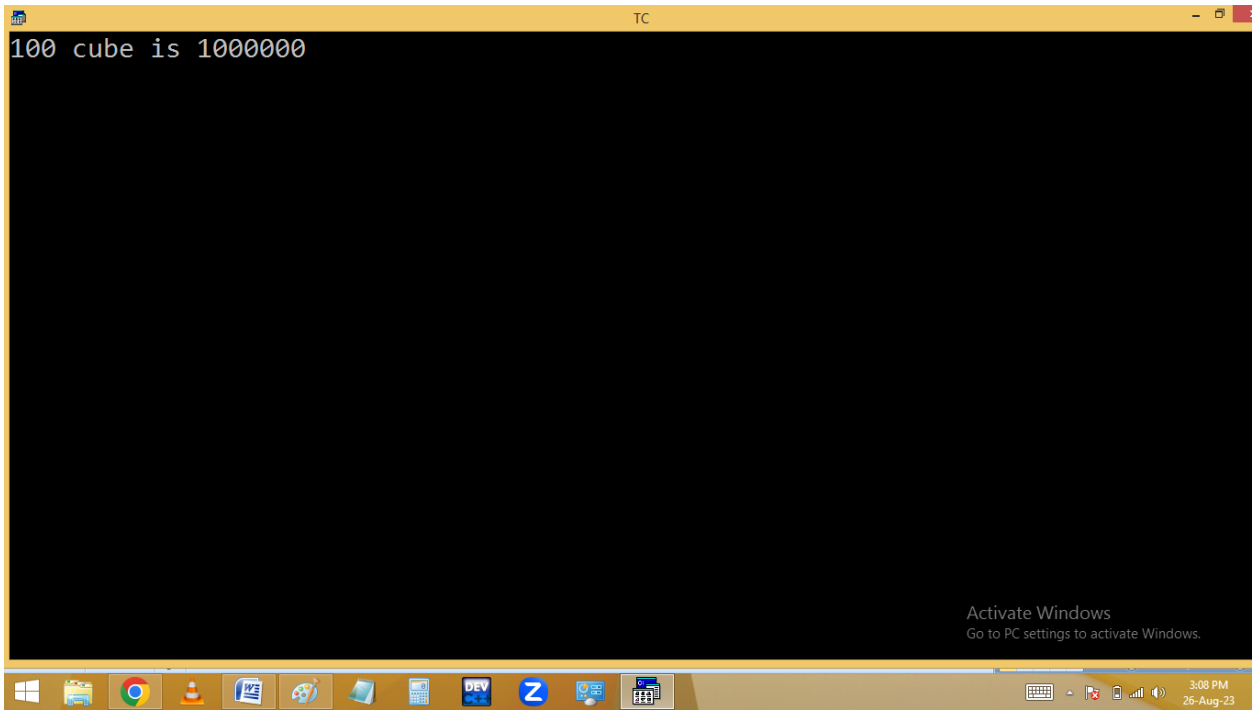

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 7 Col 31 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, cube=a*a*a;
clrscr();
printf("%d cube is %d",a, cube);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:02 PM
26-Aug-23
TC
10 cube is 1000
Activate Windows
Go to PC settings to activate Windows.
3:02 PM
26-Aug-23

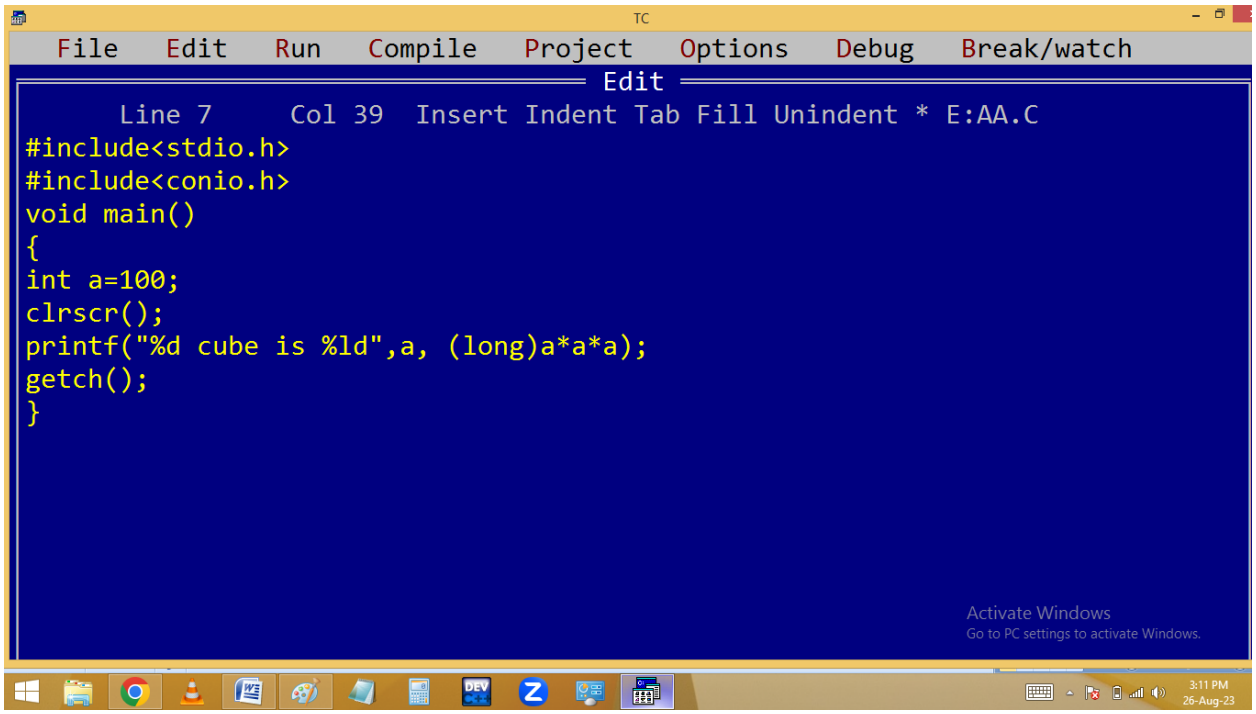

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 5 Col 10 Insert Indent Tab Fill Unindent E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100, cube=a*a*a;
clrscr();
printf("%d cube is %d",a, cube);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:03 PM
26-Aug-23
TC
100 cube is 16960
Activate Windows
Go to PC settings to activate Windows.
3:03 PM
26-Aug-23

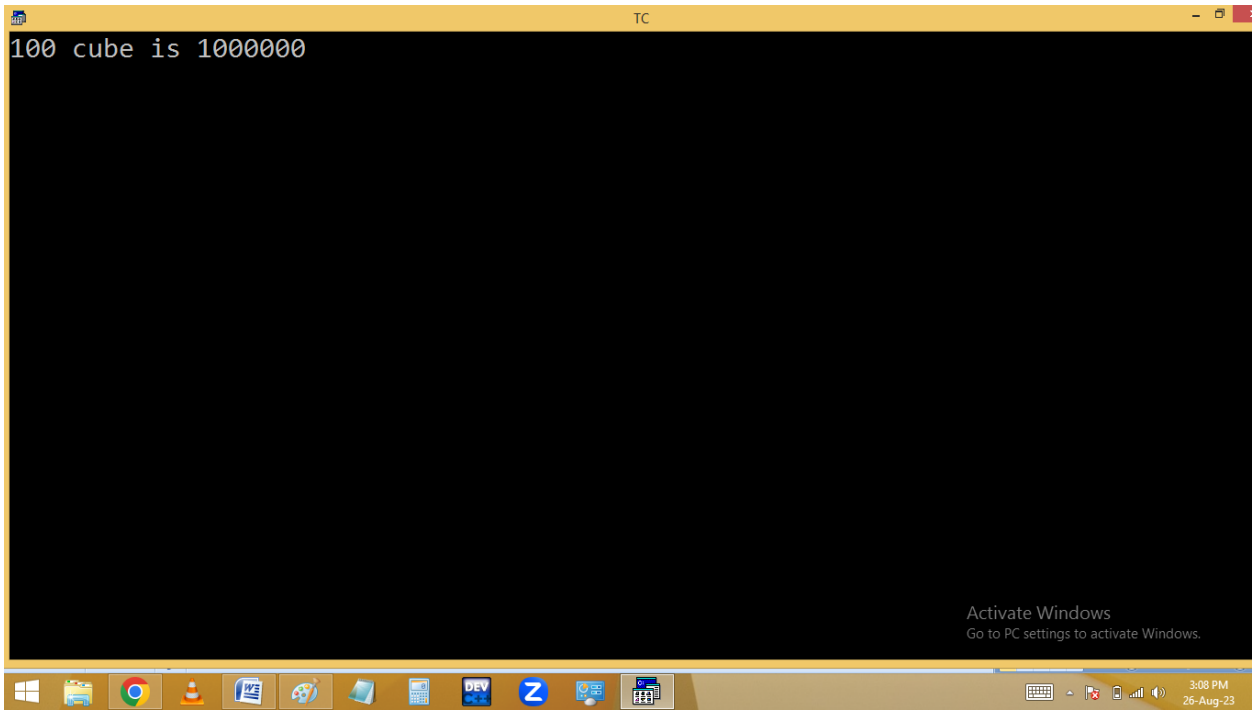

TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 8 Col 22 Insert Indent Tab Fill Unindent E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100;
long int cube=a*a*a;
clrscr();
printf("%d cube is %ld",a, cube);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:04 PM
26-Aug-23
TC
100 cube is 16960
Activate Windows
Go to PC settings to activate Windows.
3:03 PM
26-Aug-23


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 6 Col 46 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100;
long int cube=(long)a*a*a; /* type casting */
clrscr();
printf("%d cube is %ld",a, cube);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:08 PM
26-Aug-23
TC
100 cube is 1000000
Activate Windows
Go to PC settings to activate Windows.
3:08 PM
26-Aug-23


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 7 Col 11 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
long a=100, cube=a*a*a;
clrscr();
printf("%ld cube is %ld",a, cube);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:09 PM
26-Aug-23

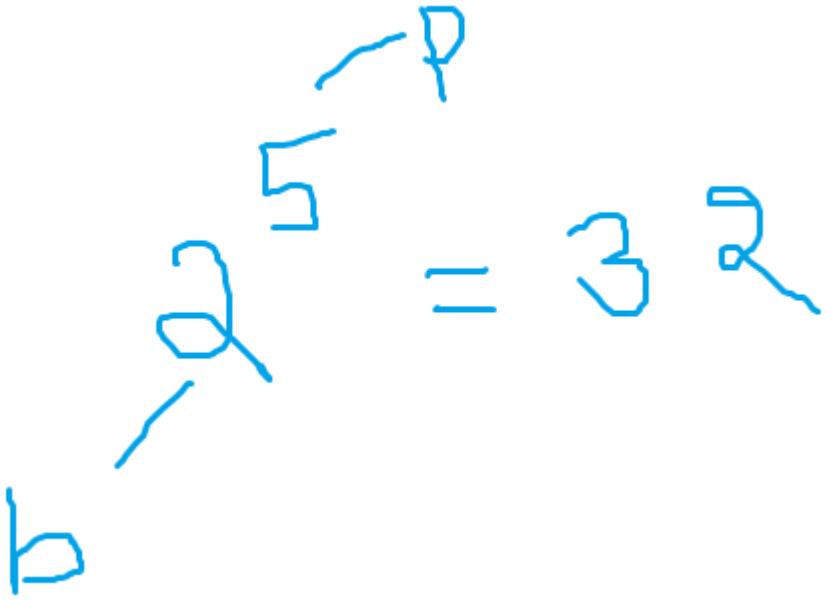

TC
100 cube is 1000000
Activate Windows
Go to PC settings to activate Windows.
3:08 PM
26-Aug-23

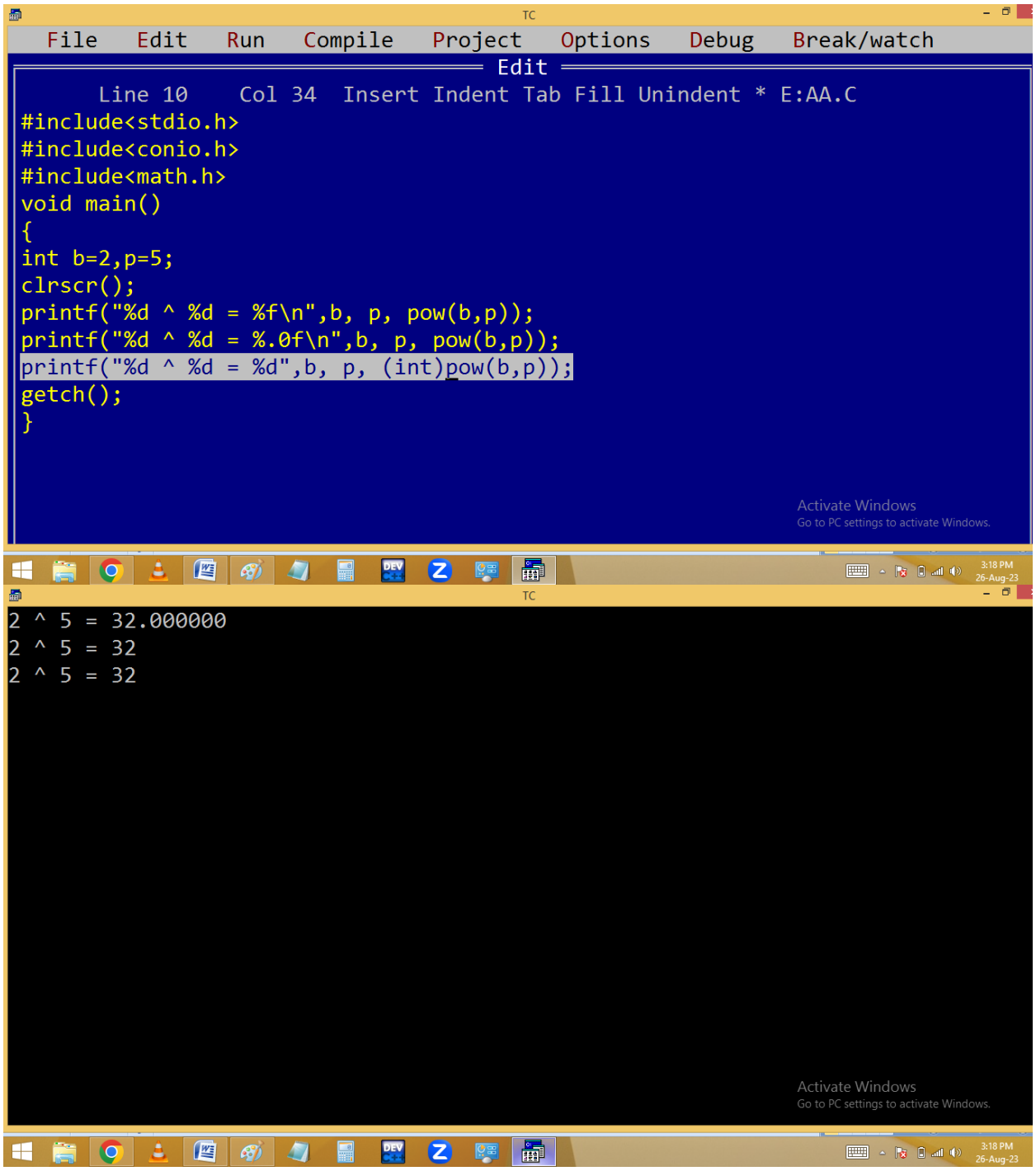




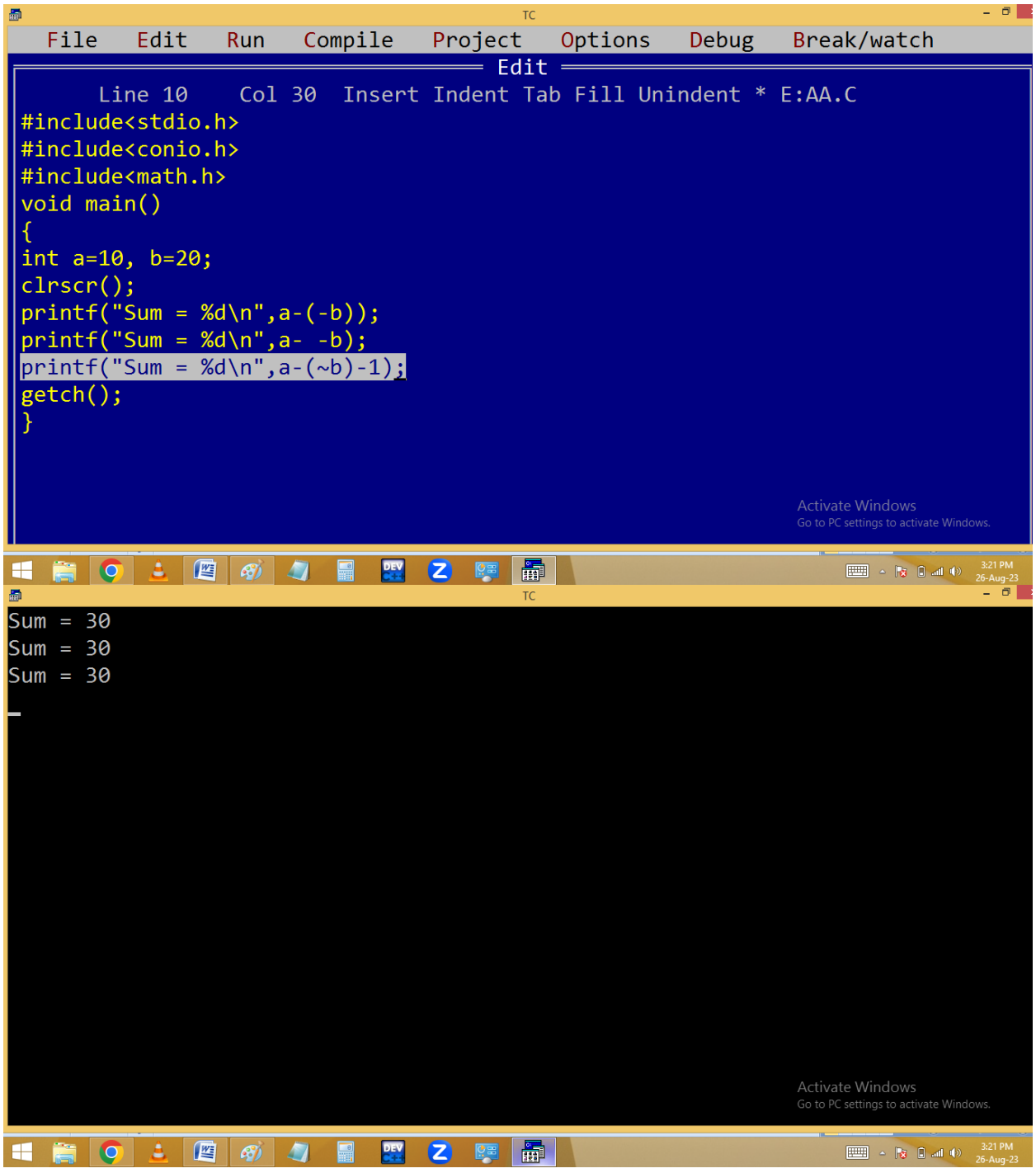
Finding power value using pow():

2^5=32





Add two numbers without using + operator:


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 10 Col 30 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int a=10, b=20;
clrscr();
printf("Sum = %d\n",a-(-b));
printf("Sum = %d\n",a- -b);
printf("Sum = %d\n",a-(~b)-1);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:21 PM
26-Aug-23
TC
Sum = 30
Sum = 30
Sum = 30
Activate Windows
Go to PC settings to activate Windows.
3:21 PM
26-Aug-23

a=10

b=20

a-(~b)-1

10-(~20)-1

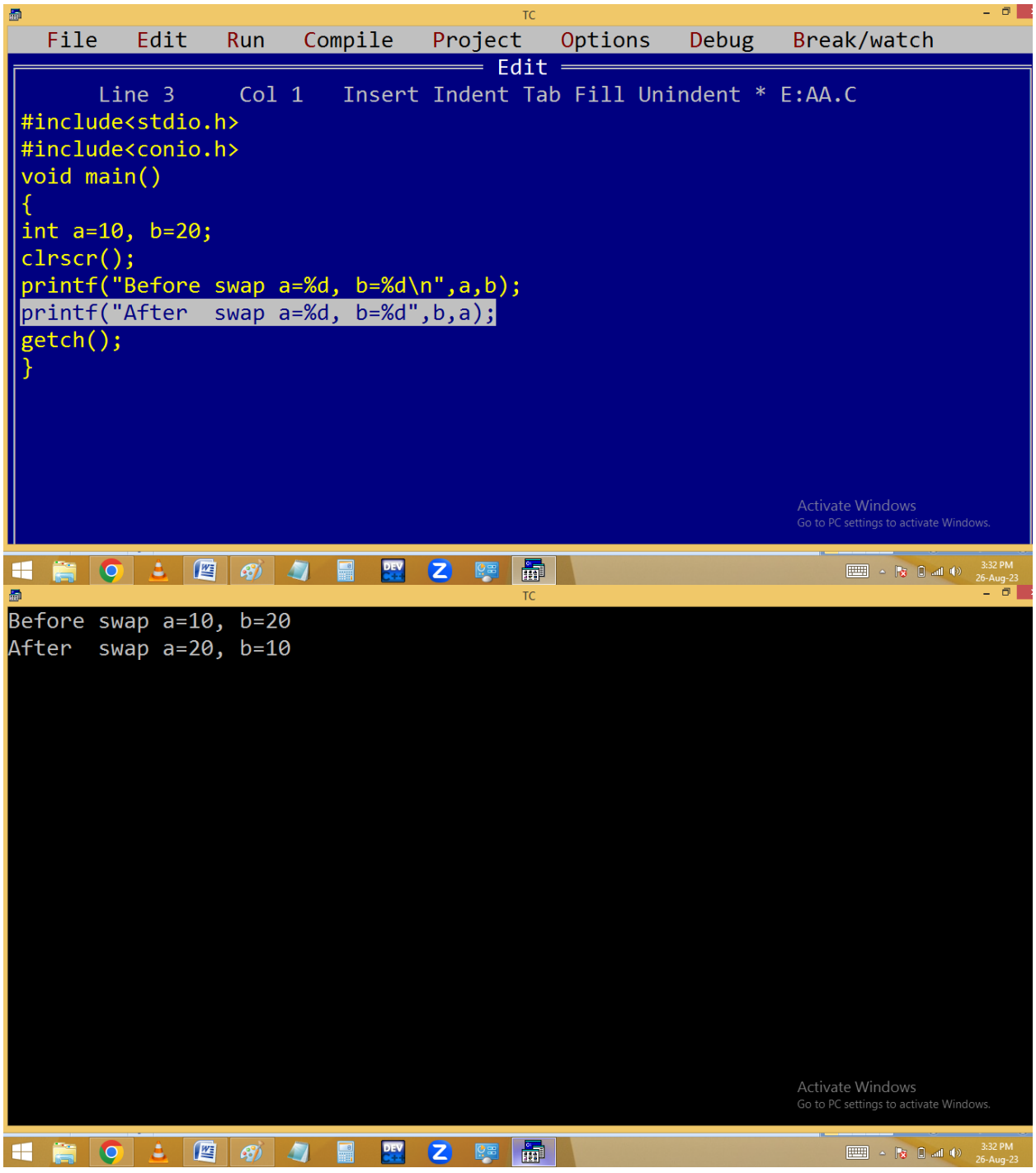
10-(-21)-1

10+21-1

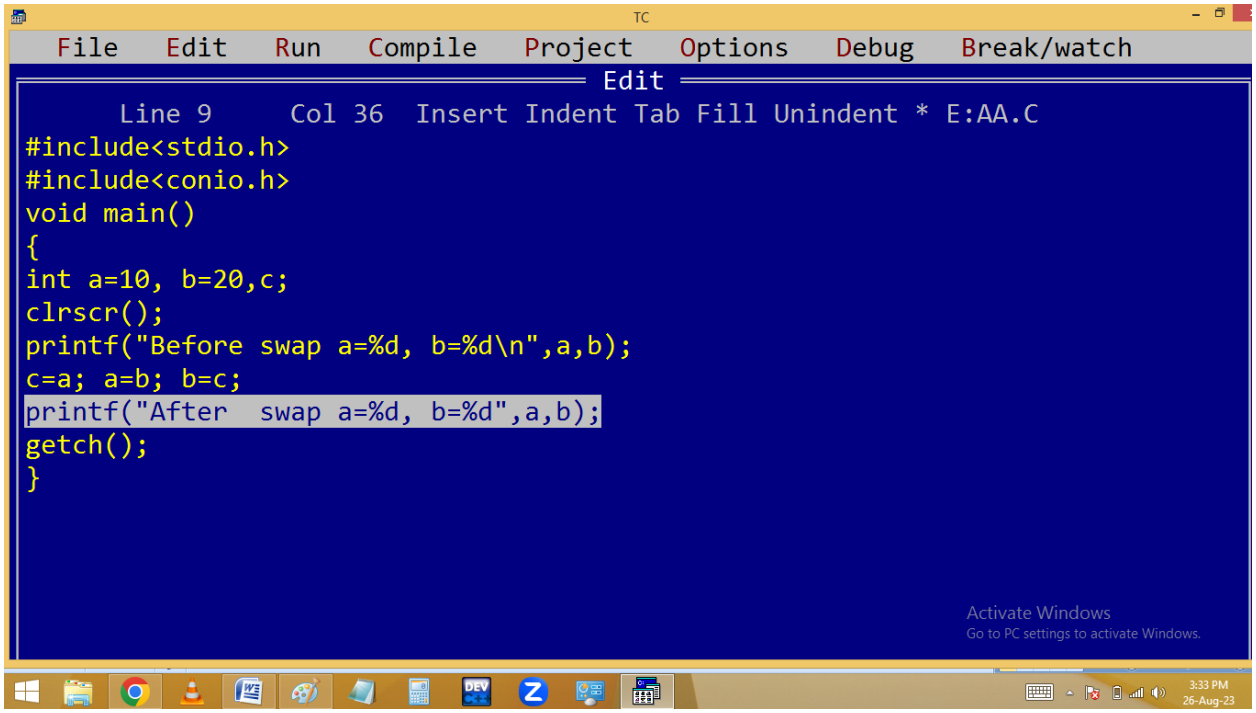
31-1=30

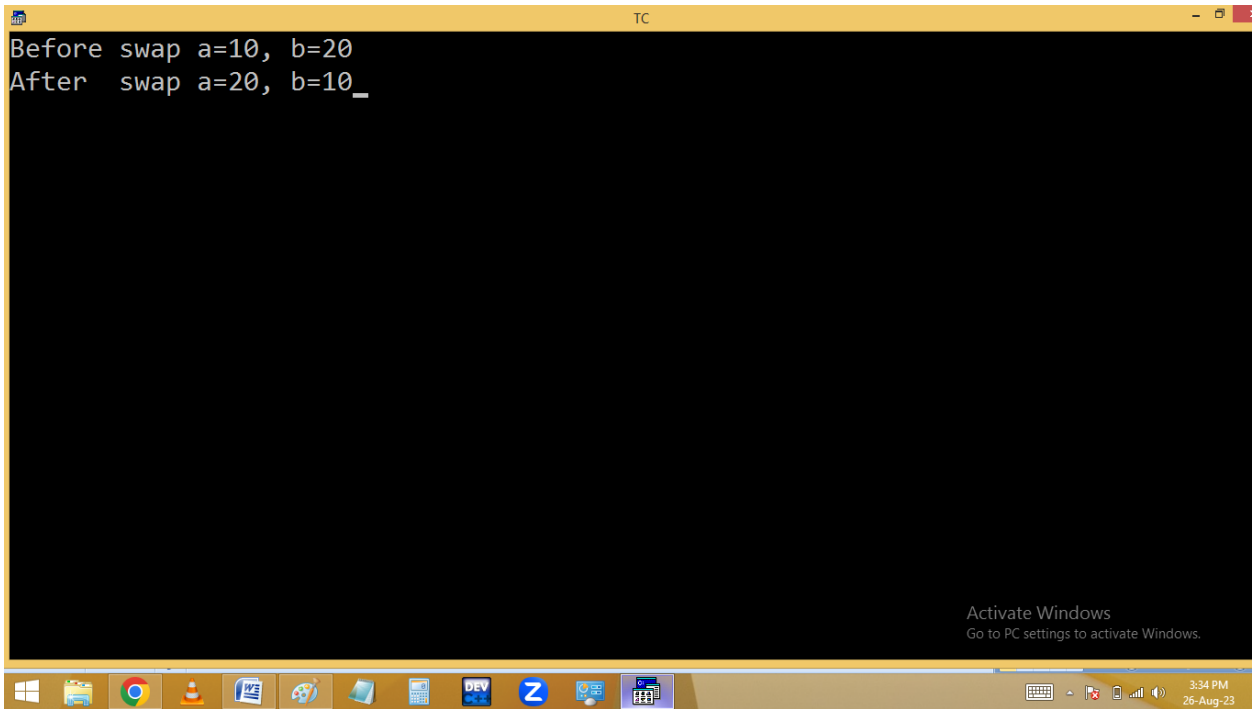
Swap [interchange]of two numbers:

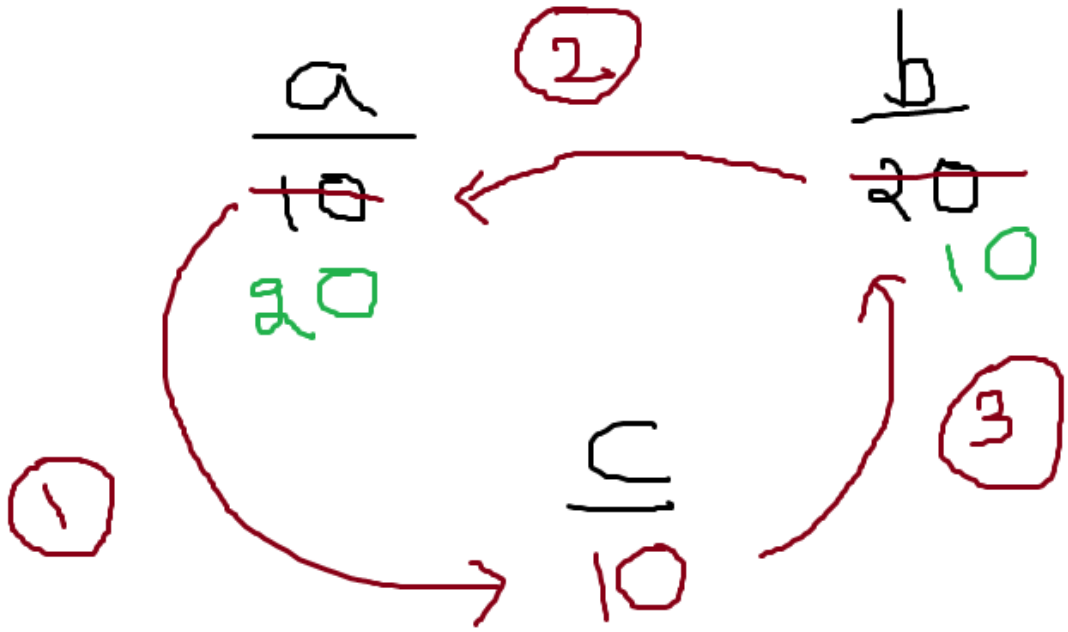
Method 1: without using operators


TC
File Edit Run Compile Project Options Debug Break/watch
Edit
Line 3 Col 1 Insert Indent Tab Fill Unindent * E:AA.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, b=20;
clrscr();
printf("Before swap a=%d, b=%d\n",a,b);
printf("After swap a=%d, b=%d",b,a);
getch();
}
Activate Windows
Go to PC settings to activate Windows.
3:32 PM
26-Aug-23
TC
Before swap a=10, b=20
After swap a=20, b=10
Activate Windows
Go to PC settings to activate Windows.
3:32 PM
26-Aug-23

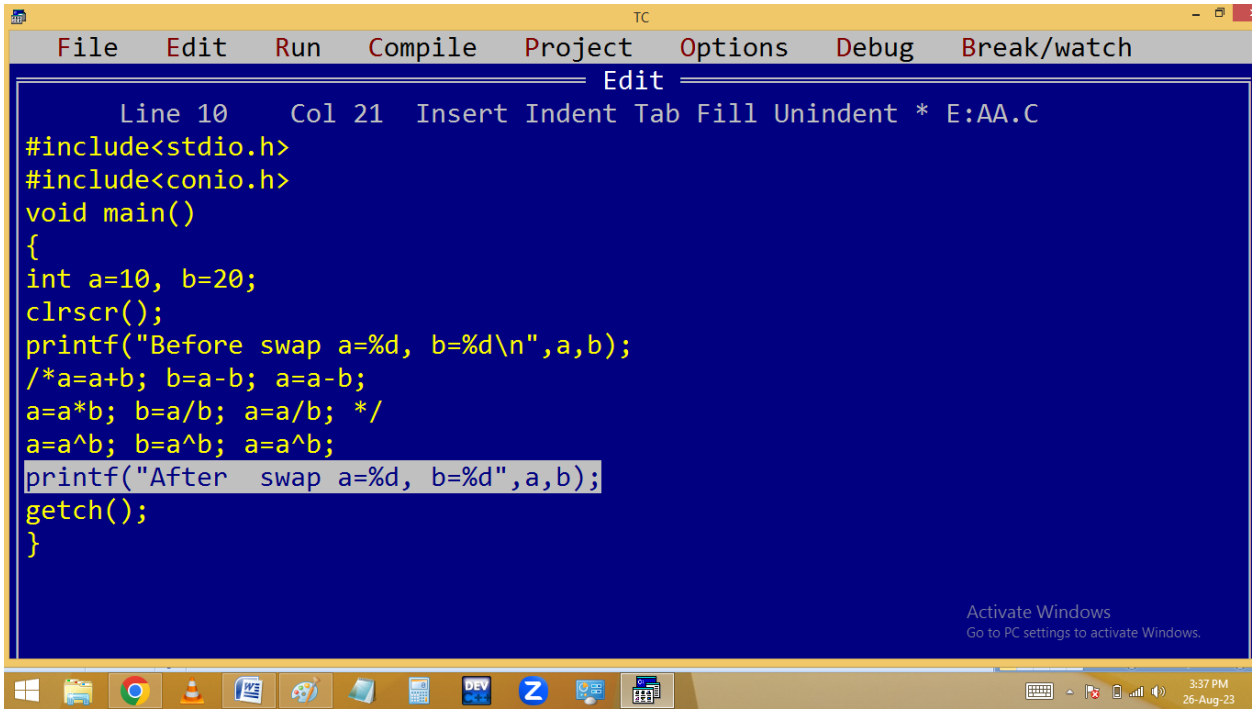
Using 3rd variable:




TC
Before swap a=10, b=20
After swap a=20, b=10
Activate Windows
Go to PC settings to activate Windows.
3:34 PM
26-Aug-23


a
b
c
2
1
3

Without using 3rd variable:



a=~~10~~ ~~30~~ 20

b=~~20~~ 10

a=a+b==>10+20=30

b=a-b==> 30-20=10

a=a-b==>30-10=20

a=~~10~~ ~~200~~ 20

b=~~20~~ 10

a=a*b==>10*20=200

b=a/b==>200/20=10

a=a/b==>200/10=20