

Compound assignment / short hand operator:

Here we are using assignment operator with combination of other operators as follows.

`+=, -=, *=, %/, <<=, >>=, ~=,`

Eg:

```
int a=3, b=10;
```

```
float c=5;
```

```
a+=4; i.e. a=a+4 → a=3+4 → a=7
```

```
b*=3; i.e. b=b*3 → b=10*3 → b=30
```

```
c/=2; i.e. c=c/2 → c=5/2 → 2.500000
```

The image shows a screenshot of the 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 11 Col 32 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=3,b=10 ;
float c=5;
clrscr();
a+=4;
b*=3;
c/=2;
printf("a=%d, b=%d, c=%f",a,b,c);
getch();
}
```

The bottom window shows the output of the program:

```
a=7, b=30, c=2.500000
```

Both windows include a status bar at the bottom with the text "Activate Windows Go to PC settings to activate Windows." and a taskbar at the very bottom showing various application icons and the system clock (2:26 PM and 2:27 PM on 18-Aug-23).

The image shows a screenshot of the 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 8 Col 25 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=20.5,b=10.3, c=5.5 ;
clrscr();
b*=c+=a/=4.4;
printf("a=%d, b=%d, c=%d_",a,b,c);
getch();
}
```

The bottom window shows the output of the program:

```
a=4, b=90, c=9
```

Both windows include a status bar at the bottom with the text "Activate Windows Go to PC settings to activate Windows." and a taskbar at the very bottom showing various application icons and the system clock (2:33 PM, 18-Aug-23).

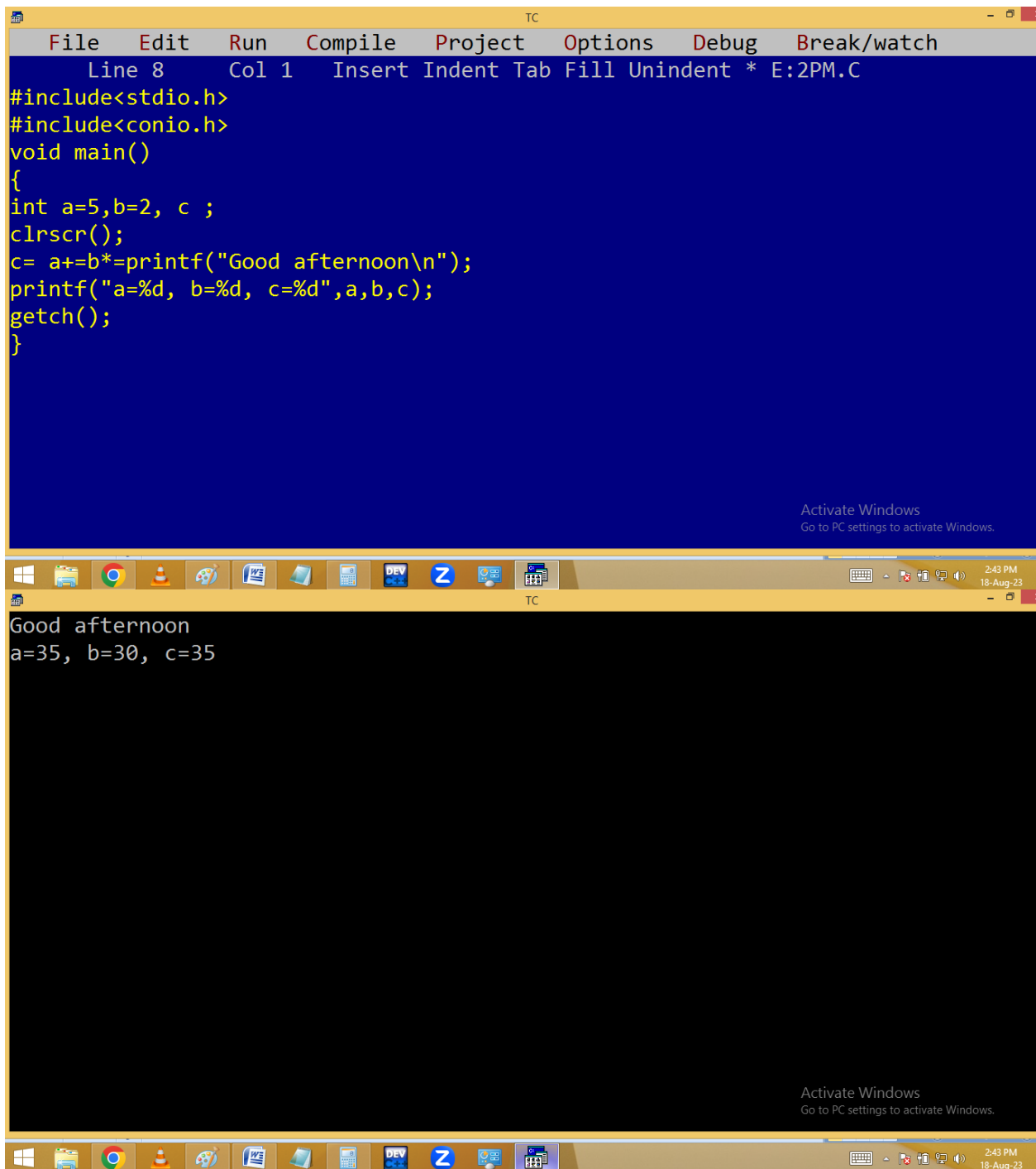
int a=20.5 b=10.3 c=5.5

b*=c+=a/=4.4;

1. $a=a/4 \Rightarrow 20/4.4=4.54$

2. $c+=a \Rightarrow 5+4=9$

3. $b=b*c \Rightarrow 10*9=90$



The image shows a screenshot of the 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 8 Col 1 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=5,b=2, c ;
clrscr();
c= a+=b*=printf("Good afternoon\n");
printf("a=%d, b=%d, c=%d",a,b,c);
getch();
}
```

The bottom window shows the output of the program:

```
Good afternoon
a=35, b=30, c=35
```

Both windows include a status bar at the bottom with the text "Activate Windows Go to PC settings to activate Windows." and a taskbar at the very bottom showing various application icons and the system clock (2:43 PM, 18-Aug-23).

a=5, b=2;

$b*=15 \implies b=2*15=30$

$a+=b \implies a=5+30=35$

c= a+=b*=printf("Good Afternoon\n");

15

c=35

() and , separators:

TC

File Edit Run Compile Project Options Debug Break/watch

Error: Declaration syntax error in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=5,2,9 ;
clrscr();
printf("a=%d",a);
getch();
}
/* Error */
```

Activate Windows
Go to PC settings to activate Windows.


TC

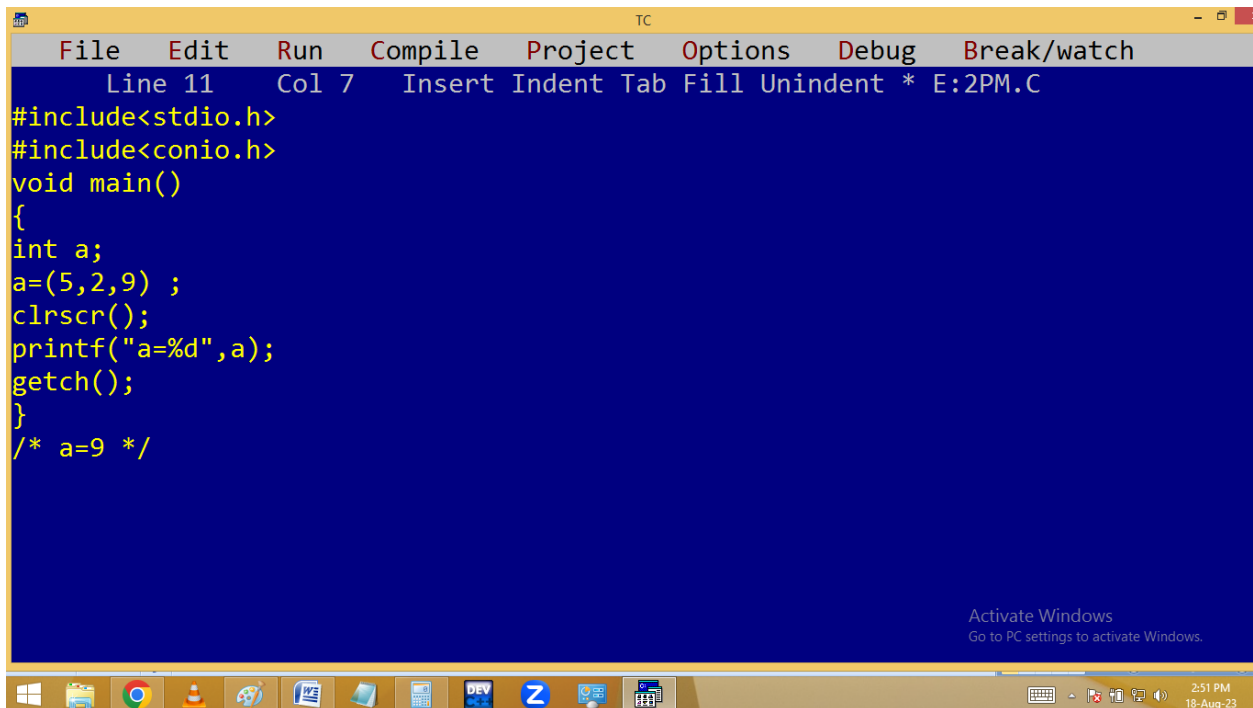
File Edit Run Compile Project Options Debug Break/watch

Line 11 Col 7 Insert Indent Tab Fill Unindent * E:2PM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
a=5,2,9 ;
clrscr();
printf("a=%d",a);
getch();
}
/* a=5 */
```

Activate Windows
Go to PC settings to activate Windows.

int a; /* declaration */
a=5, 2, 9; /* initialization */




```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 7 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
a=(5,2,9) ;
clrscr();
printf("a=%d",a);
getch();
}
/* a=9 */
```

Activate Windows
Go to PC settings to activate Windows.

$a = (5, 2, 9);$



TC

File Edit Run Compile Project Options Debug Break/watch

Line 6 Col 5 Insert Indent Tab Fill Unindent * E:2PM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=(5,2,9) ;
clrscr();
printf("a=%d",a);
getch();
}
/* a=9 */
```

Activate Windows
Go to PC settings to activate Windows.

TC

File Edit Run Compile Project Options Debug Break/watch

Line 11 Col 7 Insert Indent Tab Fill Unindent * E:2PM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
a=5,(2),9 ;
clrscr();
printf("a=%d",a);
getch();
}
/* a=5 */
```

Activate Windows
Go to PC settings to activate Windows.

a = 5 , (2) , 9;

a = 5 , 2, 9



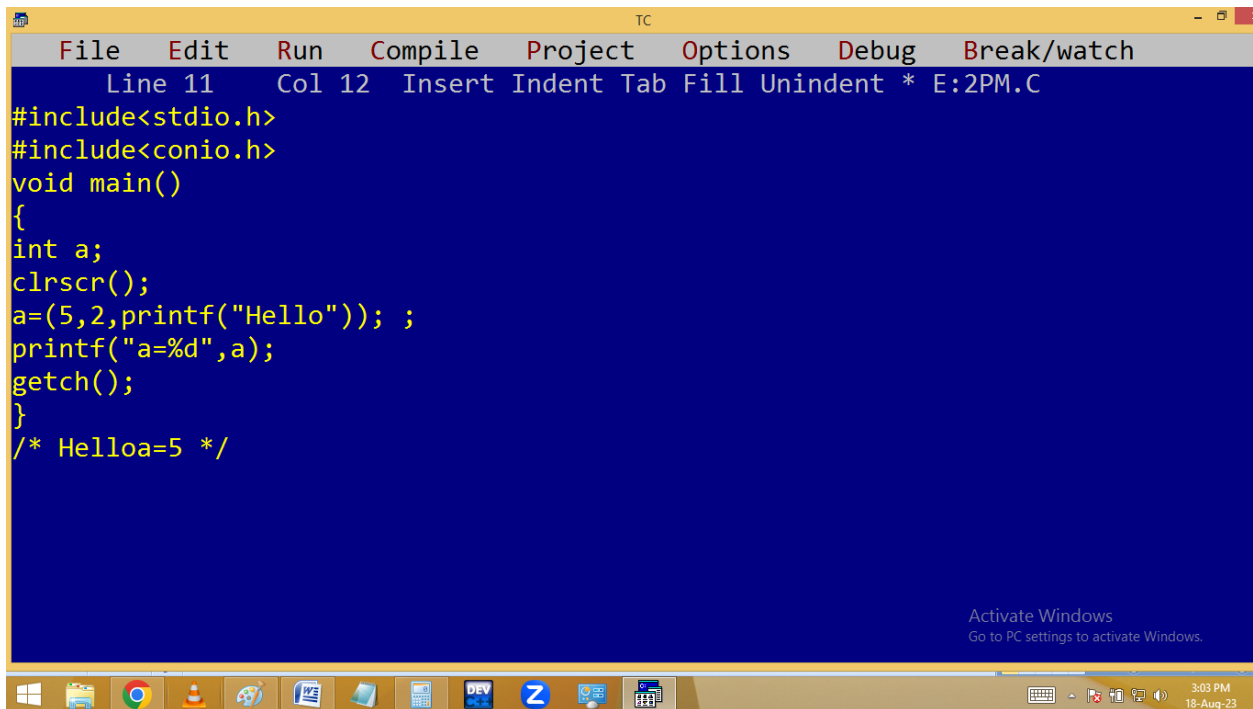
```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 7 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
a=(5,2),9 ;
clrscr();
printf("a=%d",a);
getch();
}
/* a=2 */

Activate Windows
Go to PC settings to activate Windows.
```

a = (5, 2), 9;

→
L R

a = 2, 9
~



```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 12 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
a=(5,2,printf("Hello")); ;
printf("a=%d",a);
getch();
}
/* Helloa=5 */

Activate Windows
Go to PC settings to activate Windows.

3:03 PM
18-Aug-23
```

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 12 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
a=3,2,printf("Hello");
printf("a=%d",a);
getch();
}
/* Helloa=3_*/
```

Activate Windows
Go to PC settings to activate Windows.

a = 3, 2, printf("Hello");



Hello ←
p("a=%d",a);

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 4 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
a=(1,2),3,(4,5);
printf("a=%d",a);
getch();
}
/* a=2 */

Activate Windows
Go to PC settings to activate Windows.
```

a = (1, 2), 3, (4, 5)

→ →

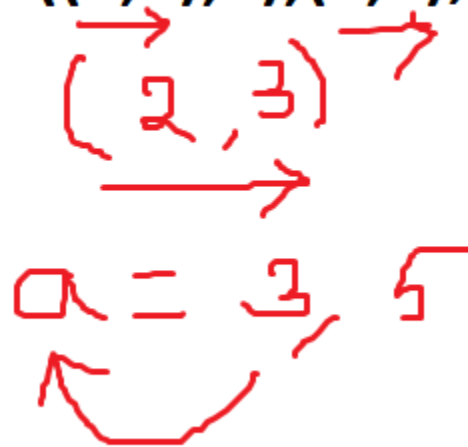
a = 2, 3, 5

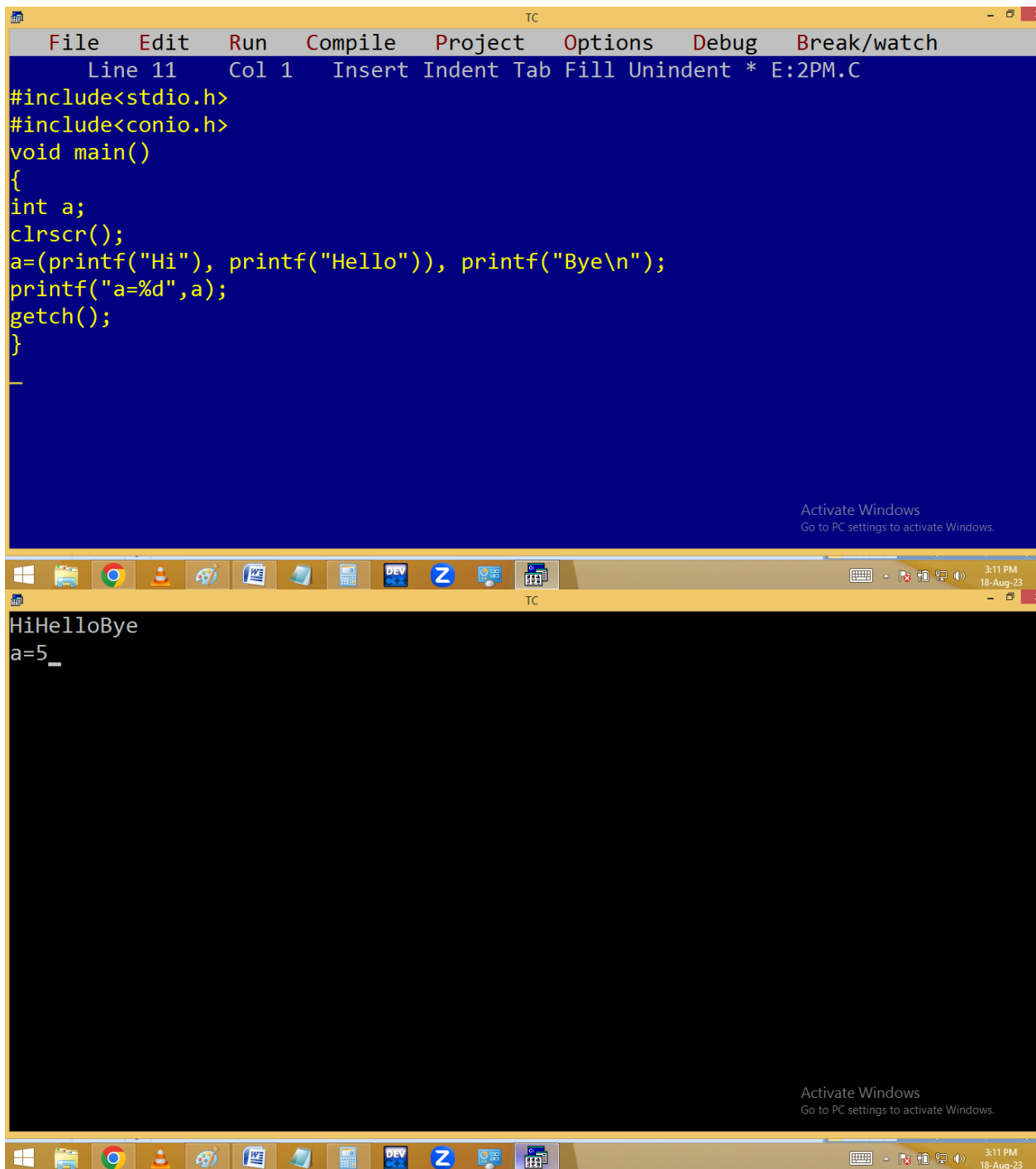
←

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 7 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
a=((1,2),3),(4,5);
printf("a=%d",a);
getch();
}
/* a=3 */
```

Activate Windows
Go to PC settings to activate Windows.

a = ((1,2),3),(4,5);





The image shows a screenshot of the 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 11 Col 1 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
a=(printf("Hi"), printf("Hello")), printf("Bye\n");
printf("a=%d",a);
getch();
}
```

The bottom window shows the output of the program:

```
HiHelloBye
a=5_
```

The Windows taskbar at the bottom indicates the time is 3:11 PM on 18-Aug-23. An "Activate Windows" watermark is visible in the bottom right corner of both windows.

a = (p("Hi"), p("Hello")) , p("Bye\n");

2, 5
→
a = 5, 4
←

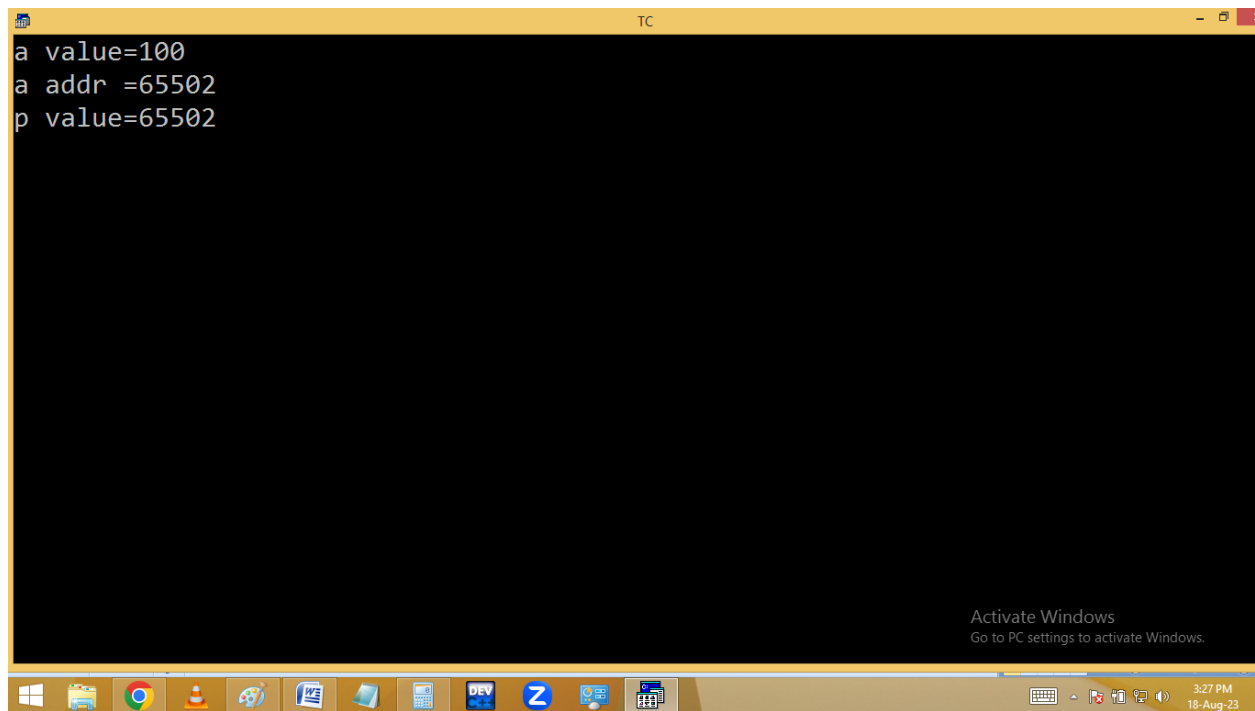
Address operators:

1. & - Address of variable / memory
2. * - pointer [Address of another variable]

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 24 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100;
int * p; /* ptr var */
clrscr();
p = &a;
printf("a value=%d\n",a);
printf("a addr =%u\n",&a);
printf("p value=%u",p);
getch();
}
```

Activate Windows
Go to PC settings to activate Windows.

3:27 PM
18-Aug-23

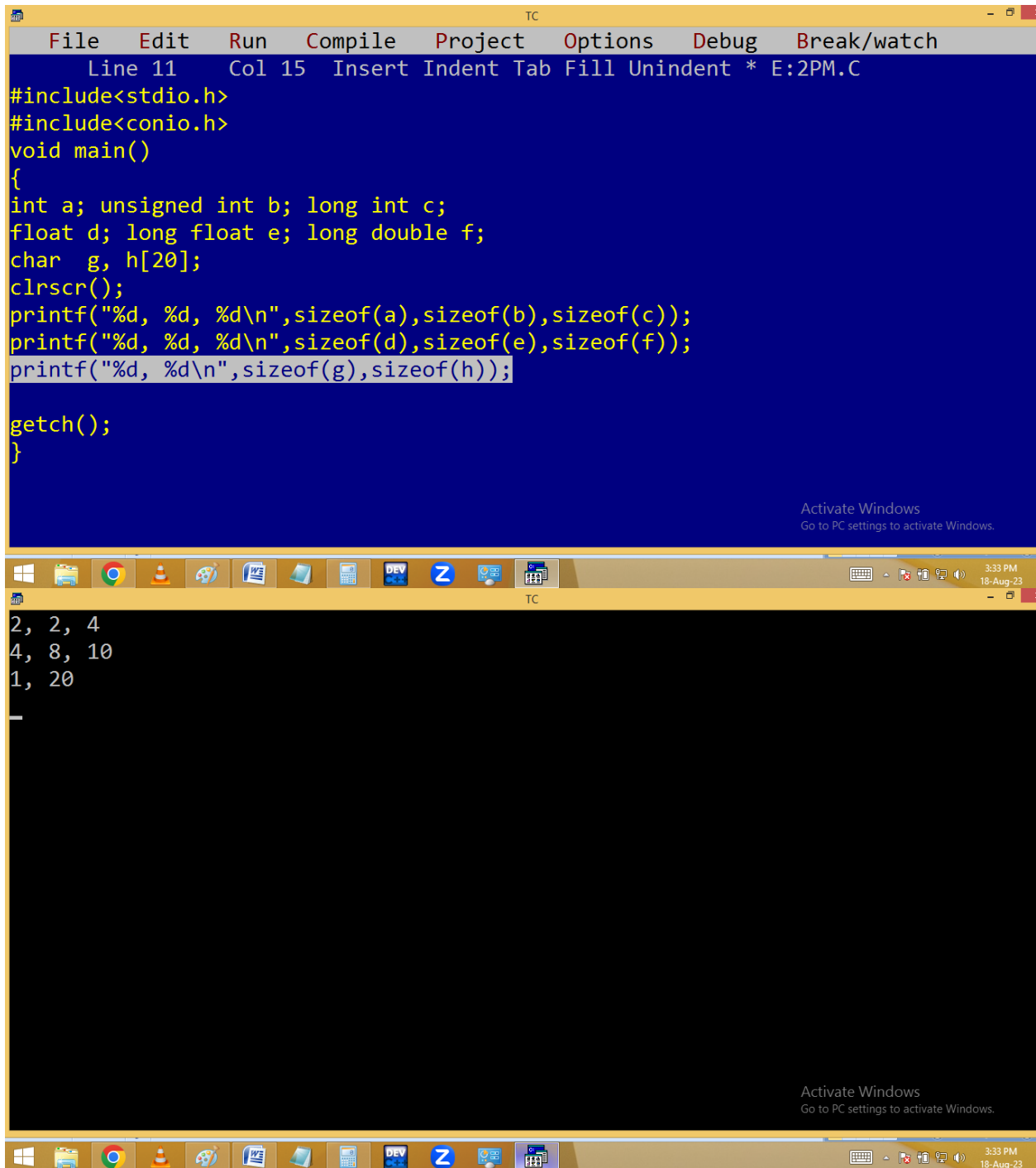


The screenshot shows a Windows 10 desktop environment. A black terminal window titled 'TC' is open, displaying the following text:

```
a value=100  
a addr =65502  
p value=65502
```

The Windows taskbar is visible at the bottom, showing various application icons including File Explorer, Google Chrome, VLC media player, Paint, Word, Excel, and several development tools. The system tray on the right indicates the time as 3:27 PM on 18-Aug-23. A watermark in the bottom right corner of the terminal window reads: 'Activate Windows Go to PC settings to activate Windows.'

sizeof(): It return the no of bytes taken by a variable / data type / value.



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

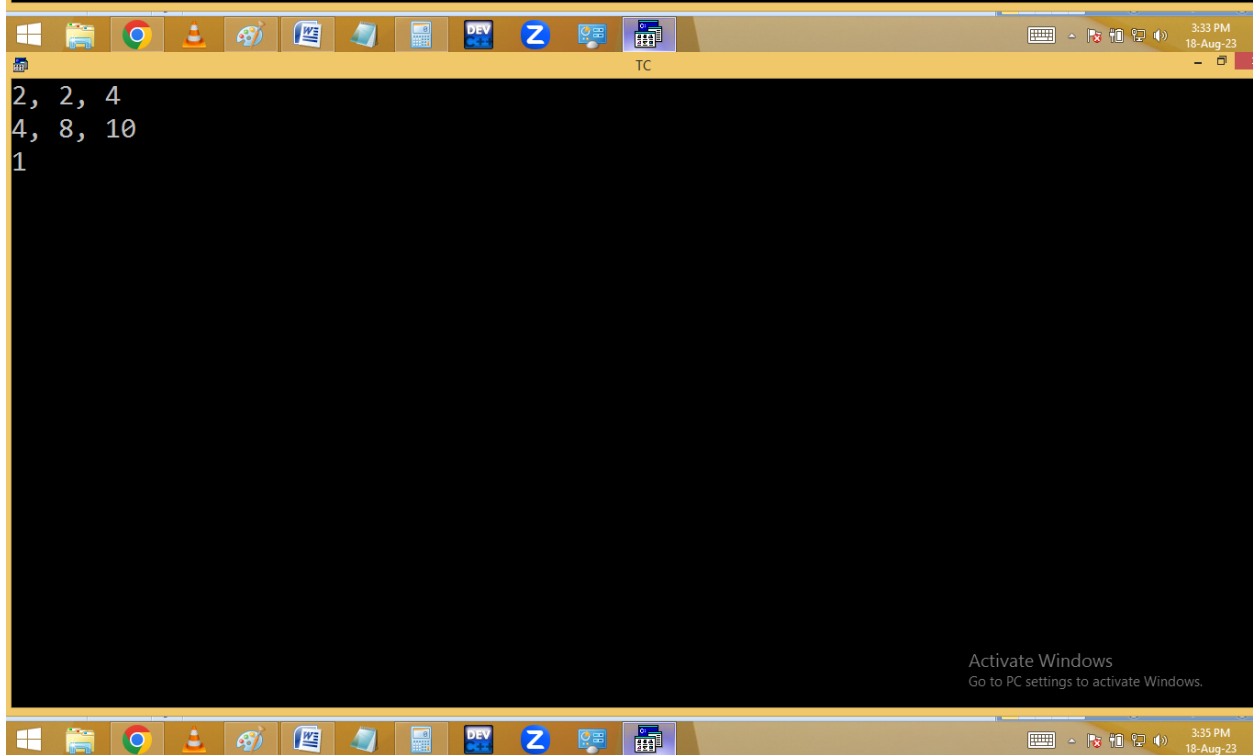
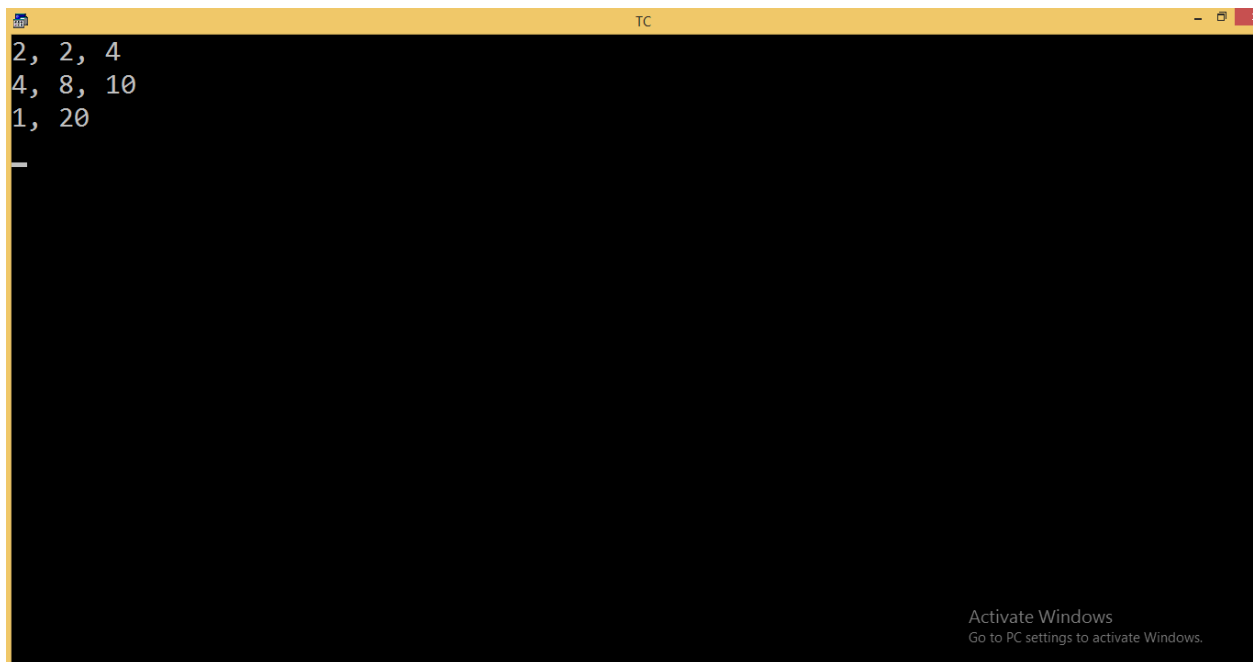
```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 15 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a; unsigned int b; long int c;
float d; long float e; long double f;
char g, h[20];
clrscr();
printf("%d, %d, %d\n",sizeof(a),sizeof(b),sizeof(c));
printf("%d, %d, %d\n",sizeof(d),sizeof(e),sizeof(f));
printf("%d, %d\n",sizeof(g),sizeof(h));

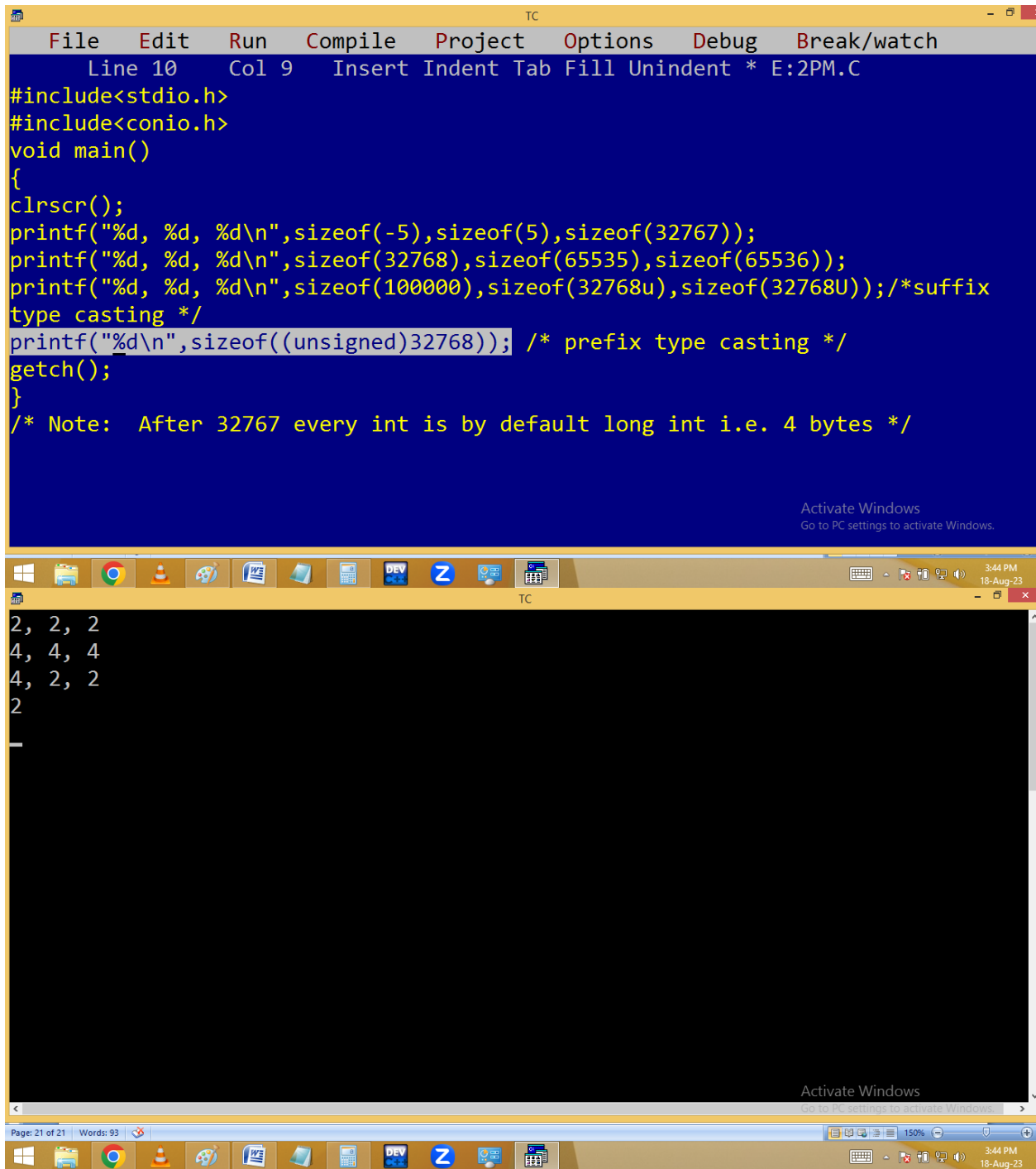
getch();
}
```

The bottom window shows the output of the program:

```
2, 2, 4
4, 8, 10
1, 20
```

The Windows taskbar at the bottom indicates the time is 3:33 PM on 18-Aug-23. An "Activate Windows" watermark is visible in the bottom right corner of both windows.





The image shows a screenshot of a Turbo C++ (TC) IDE. The top window is the source code editor, displaying a C program. The code includes `<stdio.h>` and `<conio.h>`, and defines a `main` function. It uses `clrscr()` to clear the screen and `printf` to output the sizes of various integer types. The output window below shows the results of these calculations. The Windows taskbar at the bottom indicates the system time is 3:44 PM on 18-Aug-23.

```
File Edit Run Compile Project Options Debug Break/watch
Line 10 Col 9 Insert Indent Tab Fill Unindent * E:2PM.C
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d, %d, %d\n",sizeof(-5),sizeof(5),sizeof(32767));
printf("%d, %d, %d\n",sizeof(32768),sizeof(65535),sizeof(65536));
printf("%d, %d, %d\n",sizeof(100000),sizeof(32768u),sizeof(32768U));/*suffix
type casting */
printf("%d\n",sizeof((unsigned)32768)); /* prefix type casting */
getch();
}
/* Note: After 32767 every int is by default long int i.e. 4 bytes */
```

2, 2, 2
4, 4, 4
4, 2, 2
2

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