

## Swap of two numbers:

### Method 1 without using operators:

The image shows three separate windows titled "TC" running on a Windows operating system. Each window displays a C program that swaps the values of two integers, `a` and `b`, and prints them before and after the swap.

**Code Content:**

```
#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();
}
```

**Output Content (Visible in the Middle Window):**

```
Before swap a=10, b=20
After swap a=20, b=10
```

**Windows Taskbar Details:**

- Icons: File Explorer, Google Chrome, VLC Media Player, Paint, WordPad, Notepad, DEV, Zoom, Task View, Keyboard, Mouse, Power, Volume, Network.
- Date and Time: 9:24 AM 26-Sep-23

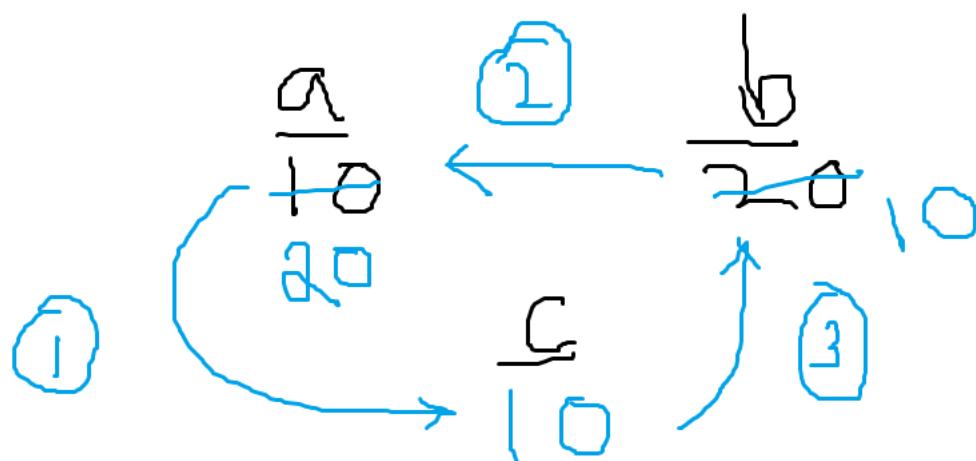
**Method 2 using 3<sup>rd</sup> variable:**

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

Activate Windows  
Go to PC settings to activate  
Windows.

```
Before swap a=10, b=20
After swap a=20, b=10
```

Activate Windows  
Go to PC settings to activate  
Windows.



**Method 3 without using 3<sup>rd</sup> variable:**

A screenshot of a Windows desktop environment. At the top is a taskbar with various icons. Below it is a terminal window titled "TC". The terminal window has a menu bar with "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". It displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,b=20;
clrscr();
printf("Before swap a=%d, b=%d\n",a,b);
/*a=a+b; b=a-b; a=a-b;
a=a*b; b=a/b; a=a/b;*/
a=a^b; b=a^b; a=a^b;
printf("After swap a=%d, b=%d",a,b);
getch();
}
```

The terminal window shows the output of the program:

```
Before swap a=10, b=20
After swap a=20, b=10
```

To the right of the terminal window, there is a watermark that says "Activate Windows" and "Go to PC settings to activate Windows.".

A screenshot of a Windows desktop environment, identical to the one above. It features a taskbar with various icons and a terminal window titled "TC". The terminal window displays the same C code and its output as the first screenshot:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,b=20;
clrscr();
printf("Before swap a=%d, b=%d\n",a,b);
/*a=a+b; b=a-b; a=a-b;
a=a*b; b=a/b; a=a/b;*/
a=a^b; b=a^b; a=a^b;
printf("After swap a=%d, b=%d",a,b);
getch();
}
```

The terminal window shows the output:

```
Before swap a=10, b=20
After swap a=20, b=10
```

To the right of the terminal window, there is a watermark that says "Activate Windows" and "Go to PC settings to activate Windows.".

$a=10 \Rightarrow 30 \Rightarrow 20$

$b=20 \Rightarrow 10$

$a=a+b \Rightarrow 10+20=30$

$b=a-b \Rightarrow 30-20=10$

$a=a-b \Rightarrow 30-10=20$

$a=10 \Rightarrow 200 \Rightarrow 20$

$b=20 \Rightarrow 10$

$a=a*b \Rightarrow 10*20=200$

$b=a/b \Rightarrow 200/20=10$

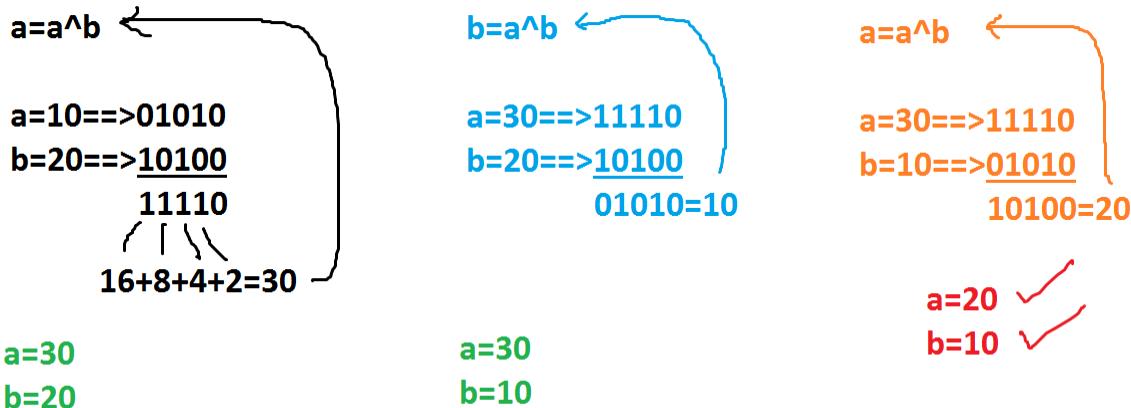
$a=a/b \Rightarrow 200/10=20$

$$\begin{array}{r} 10 \\ 2 \overline{)10} \\ 2 \overline{)5} - 0 \\ 2 \overline{)2} - 1 \\ 1 - 0 \end{array}$$

$$10 = 1010$$

$$\begin{array}{r} 20 \\ 2 \overline{)20} \\ 2 \overline{)10} - 0 \\ 2 \overline{)5} - 0 \\ 2 \overline{)2} - 1 \\ 1 - 0 \end{array}$$

$$20 = 10100$$



**scanf()**: it is a predefined function available in <stdio.h>

it is used to read the values at runtime using the keyboard.

In scanf, f means formatted.

Scarf always refers standard input device i.e. keyboard.

## Syntax:

**int scanf("conversion characters",  
&variable, &variable,.....);**

- Here scanf() returns an integer which indicates the no of conversion characters we have used in scanf().

- Generally conversion characters are the first arguments and they should be placed in “ ”.
- Space is optional in between the conversion characters. When comma / any character is entered in between conversion characters, at run time also we have to enter the same letter in between the values.
- **&** indicates address of variable. **&** is mandatory for all data types **except string** type variables.

**Eg: Finding no of conversion characters in  
scanf():**

TC

File Edit Run Compile Project Options Debug Break/watch  
Line 8 Col 17 Insert Indent Tab Fill Unindent \* E:9AM.C

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

Activate Windows  
Go to PC settings to activate Windows.



10:06 AM  
26-Sep-23

TC

```
Enter a, b values 10 20
a=10, b=20, conversions=2
```

Activate Windows  
Go to PC settings to activate Windows.



10:06 AM  
26-Sep-23

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom indicates Line 6, Col 30, Insert, Indent, Tab, Fill, Unindent, and \* E:NONAME.C. The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Enter two numbers ");
printf("conversions=%d", scanf("%d%d"));
getch();
}
```

The taskbar at the bottom shows various application icons, and the system tray displays the date and time as 10:07 AM 26-Sep-23.

The screenshot shows a terminal window with the text "TC" in the title bar. The command "Enter two numbers 10 20" is entered, followed by "conversions=2\_". The taskbar and system tray are visible at the bottom, showing the same icons and date/time as the previous screenshot.

**Controlling inputs in scanf():**

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom indicates Line 11, Col 24, Insert, Indent, Tab, Fill, Unindent, and E:9AM.C. The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a value ");
scanf("%d", &a);
printf("Enter b value ");
scanf("%d",&b);
printf("a=%d, b=%d",a,b);
getch();
}
```

In the bottom right corner of the code window, there is a watermark that says "Activate Windows Go to PC settings to activate Windows."

The taskbar at the bottom of the screen shows various application icons, including Windows File Explorer, Google Chrome, VLC Media Player, Paint, WordPad, Notepad, DEV, Zoom, and Task View. The system tray shows the date and time as 10:09 AM 26-Sep-23.

The screenshot shows a terminal window with a black background and white text. It displays the output of the C program:

```
Enter a value 3
Enter b value 8
a=3, b=8
```

In the bottom right corner of the terminal window, there is a watermark that says "Activate Windows Go to PC settings to activate Windows."

The taskbar at the bottom of the screen shows various application icons, including Windows File Explorer, Google Chrome, VLC Media Player, Paint, WordPad, Notepad, DEV, Zoom, and Task View. The system tray shows the date and time as 10:09 AM 26-Sep-23.

```
TC
Enter a value 4 7
Enter b value a=4, b=7

Activate Windows
Go to PC settings to activate
Windows.

10:10 AM
26-Sep-23
```

```
TC
Enter a value 1 2 3
Enter b value a=1, b=2

Activate Windows
Go to PC settings to activate
Windows.

10:11 AM
26-Sep-23
```

TC

File Edit Run Compile Project Options Debug Break/watch

Line 9 Col 12 Insert Indent Tab Fill Unindent \* E:9AM.C

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

Activate Windows  
Go to PC settings to activate Windows.

10:12 AM 26-Sep-23

TC

```
Enter a value 10 20
Enter b value 44
a=10, b=44_
```

Activate Windows  
Go to PC settings to activate Windows.

10:12 AM 26-Sep-23

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a value ");
scanf("%d", &a);
fflush(stdin);
printf("Enter b value ");
scanf("%d",&b);
printf("a=%d, b=%d",a,b);
getch();
}
```

Activate Windows  
Go to PC settings to activate Windows.

```
Enter a value 34 76
Enter b value 99
a=34, b=99
```

Activate Windows  
Go to PC settings to activate Windows.

TC

```
Enter a value 1 2 3 45 56
Enter b value 9
a=1, b=9
```

Activate Windows  
Go to PC settings to activate Windows.

10:13 AM  
26-Sep-23

TC

File Edit Run Compile Project Options Debug Break/watch

Line 9 Col 1 Insert Indent Tab Fill Unindent \* E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a 2 digit value ");
scanf("%d", &a);
printf("Enter a 3 digit value ");
scanf("%d",&b);
printf("a=%d, b=%d",a,b);
getch();
}
```

Activate Windows  
Go to PC settings to activate Windows.

10:14 AM  
26-Sep-23

```
TC
Enter a 2 digit value 23
Enter a 3 digit value 124
a=23, b=124_
```

Activate Windows  
Go to PC settings to activate Windows.



```
TC
Enter a 2 digit value 12345
Enter a 3 digit value 23456
a=12345, b=23456_
```

Activate Windows  
Go to PC settings to activate Windows.

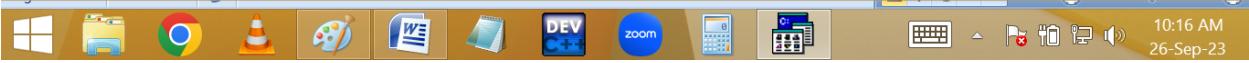


TC

File Edit Run Compile Project Options Debug Break/watch  
Line 10 Col 10 Insert Indent Tab Fill Unindent \* E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a 2 digit value ");
scanf("%2d", &a);
printf("Enter a 3 digit value ");
scanf("%3d",&b);
printf("a=%d, b=%d",a,b);
getch();
}
```

Activate Windows  
Go to PC settings to activate Windows.



10:16 AM  
26-Sep-23

TC

```
Enter a 2 digit value 1
Enter a 3 digit value 2
a=1, b=2
```

Activate Windows  
Go to PC settings to activate Windows.



10:16 AM  
26-Sep-23

```
File Edit Run Compile Project Options Debug Break/watch  
Line 10 Col 10 Insert Indent Tab Fill Unindent * E:9AM.C  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
int a,b;  
clrscr();  
printf("Enter a 2 digit value ");  
scanf("%2d", &a);  
printf("Enter a 3 digit value ");  
scanf("%3d",&b);  
printf("a=%d, b=%d",a,b);  
getch();  
}  
Activate Windows  
Go to PC settings to activate  
Windows.  
10:19 AM  
26-Sep-23
```

```
Enter a 2 digit value 123456789  
Enter a 3 digit value a=12, b=345  
Activate Windows  
Go to PC settings to activate  
Windows.  
10:19 AM  
26-Sep-23
```

TC

File Edit Run Compile Project Options Debug Break/watch  
Line 9 Col 12 Insert Indent Tab Fill Unindent \* E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a 2 digit value ");
scanf("%2d", &a);
flushall();_
printf("Enter a 3 digit value ");
scanf("%3d",&b);
printf("a=%d, b=%d",a,b);
getch();
}
```

Activate Windows  
Go to PC settings to activate Windows.



10:20 AM  
26-Sep-23

TC

```
Enter a 2 digit value 9999999
Enter a 3 digit value 555555
a=99, b=555_
```

Activate Windows  
Go to PC settings to activate Windows.



10:20 AM  
26-Sep-23

## Eg. Finding area and circumference of a circle.

A screenshot of a Windows desktop environment. At the top is a window titled "TC" containing a C program to calculate the area and circumference of a circle. The code uses standard input-output functions and arithmetic operations. Below the window is a taskbar with various icons for common applications like File Explorer, Google Chrome, and Zoom. The system tray shows the date and time as 10:24 AM on 26-Sep-23. A watermark for "Activate Windows" is visible in the center-right of the screen.

```
#include<stdio.h>
#include<conio.h>
void main()
{
const float pi=3.14;
float r, area, cf;
clrscr();
printf("Enter circle radius ");
scanf("%f",&r);
area = pi * r * r;
cf   = 2 * pi * r;
printf("Area=%.2f, Cf=%.2f",area, cf);
getch();
}_
```

A screenshot of the same Windows desktop environment, showing the result of running the previously shown C program. The "TC" window now displays the output: "Enter circle radius 10" followed by "Area=314.00, Cf=62.80". The taskbar and system tray remain the same, and the "Activate Windows" watermark is still present.

TC

```
Enter circle radius 2
Area=12.56, Cf=12.56
```

Activate Windows  
Go to PC settings to activate Windows.

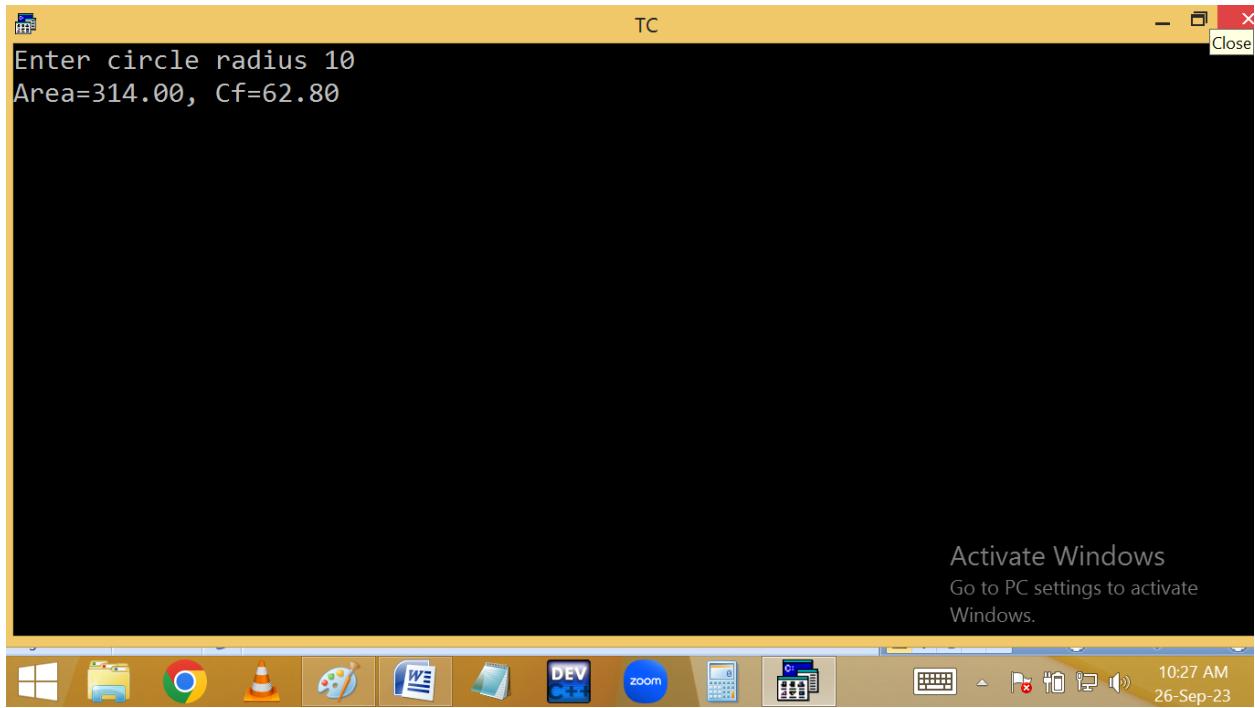
10:25 AM  
26-Sep-23

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>
#define pi 3.14 /* macro */
void main()
{
float r, area, cf;
clrscr();
printf("Enter circle radius ");
scanf("%f",&r);
area = pi * r * r;
cf = 2 * pi * r;
printf("Area=%f, Cf=%f",area, cf);
getch();
}
```

Activate Windows  
Go to PC settings to activate Windows.

10:27 AM  
26-Sep-23



## Celsius to Fahrenheit conversion:

$$F = c * 1.8 + 32;$$

The screenshot shows a Windows desktop with a terminal window titled "TC". The terminal window has a yellow header bar with menu options: File, Edit, Run, Compile, Project, Options, Debug, Break/watch. Below the menu, it displays the current line and column (Line 10 Col 57), the current file (E:9AM.C), and the source code of a C program. The source code reads a Celsius temperature from the user, converts it to Fahrenheit using the formula  $f = c * 1.8 + 32$ , and prints the result. The terminal window also includes a watermark for Windows activation.

```
#include<stdio.h>
#include<conio.h>
void main()
{
float c, f;
clrscr();
printf("Enter temp in celsius ");
scanf("%f",&c);
f = c * 1.8 + 32;
printf("%.1f°C Celsius is %.1f°F Fahrenheit",c,248,f,248);
getch();
}
```

The screenshot shows the same Windows desktop environment after running the C program. The terminal window titled "TC" now displays the output: "Enter temp in celsius 37" followed by "37.0° Celsius is 98.6° Fahrenheit". The terminal window also includes a watermark for Windows activation.

Activate Windows  
Go to PC settings to activate Windows.

## Fahrenheit to Celsius:

$$C = \frac{f - 32}{9} \times 5$$

The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. Below it is a terminal window titled "TC". The terminal window has a menu bar with "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". It displays the following code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
float c, f;
clrscr();
printf("Enter temp in Fahrenheit ");
scanf("%f",&f);
c = (f - 32) * 5/9;
printf("%.1f°C Fahrenheit is %.1f°C Celsius",f,248,c,248);
getch();
}
```

Below the terminal window, a message from Microsoft says "Activate Windows Go to PC settings to activate Windows." The system tray at the bottom right shows the date and time as "10:46 AM 26-Sep-23".

The screenshot shows the same terminal window from the previous image, now displaying the output of the program. The text "Enter temp in Fahrenheit 98.6" is followed by "98.6° Fahrenheit is 37.0° Celsius". The rest of the interface is identical to the first screenshot.

