

INTRODUCTION TO C

C is a

- 1. It is a high level / middle level programming language.**
- 2. C is a compiler based programming language.**
- 3. C is a procedure oriented programming language[POP's].**
- 4. C is a general purpose programming language.**

What is a program?

Set of instructions is called program.

What is a software?

Set of programs is called software. As per IT industry software is a digitalized and automated process.

```
/* source code / source program */
#include<stdio.h>
void main()
{
    int i; /* variable */
    for(i=1;i<=100;i++)
    {
        printf("",i);
    }
}
```

computer programming languages like

C / C++ / Java / .net / python

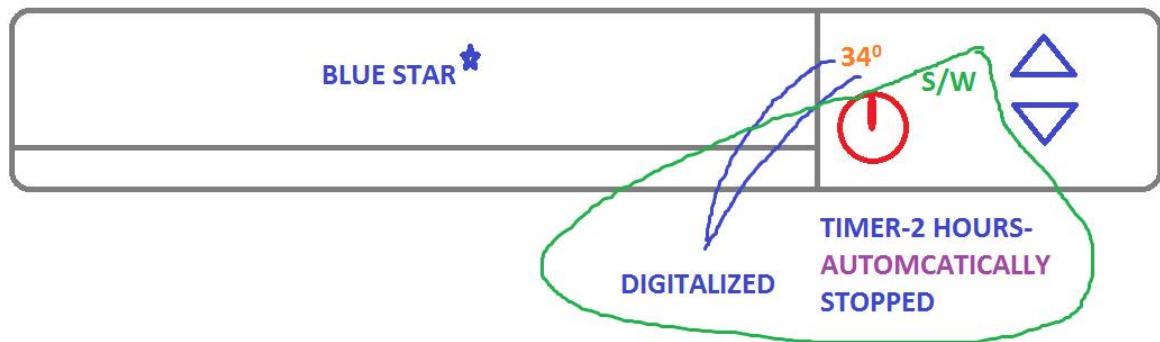
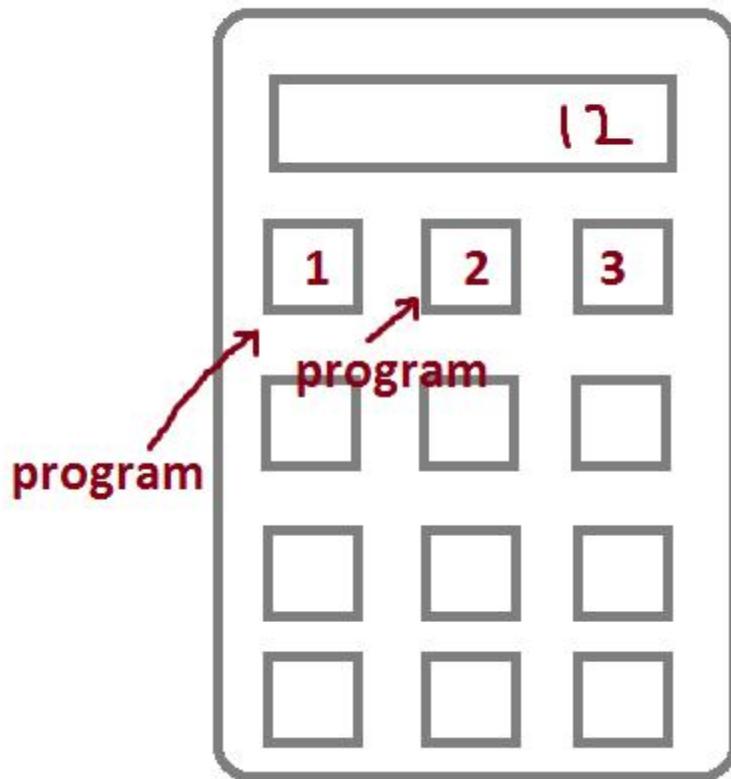
set of instructions

set of programs

software

tcs/wipro/microsoft - software companies - software engineer/developers/programmers/techies

set of programs-s/w



We are having 2 type of software.

1. System software

Eg: o.s, device drivers, translators

2. Application software

Eg: phonepe, irctc, whatsapp,instagram,...

What is a language?

Generally the languages like telugu / English / Marathi / hindi etc are used to communicate with humans. Hence they are called human languages / regional languages. By using these human languages we can't communicate with the machines. Hence we are using the computer programming languages like C / C++ / Java / .net / pythos etc. By using these languages we are creating the **software** [programs] to communicate.

Basically the languages are divided into 3 types.

1. **Machine language**: Created with **binary code** [0,1] and very difficult to understand.

Eg: 1000111

2. **Low level / assembly language**: Created with English like shortcuts called **MNEMONICS**.

Eg: gd mrg, plz, sub,.....

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Search, Run, Compile, Debug, Project, Options, and Window. The title bar displays "Turbo C++ IDE" and "ASS.CPP". The code editor window contains the following C code:

```
#include<stdio.h>
void main() {
    int a = 10, b = 20, c;
    asm {
        mov ax,a
        mov bx,b
        add ax,bx
        mov c,ax
    }
    printf("c= %d",c);
}
```

The output window at the bottom shows the result of the program's execution: "c= 30_". The system tray icons and taskbar are visible at the bottom of the screen.

3. High level language: Created with simple English and easy to understand.

Eg: good morning, please, subject,....

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Search, Run, Compile, Debug, Project, Options, and Window. The title bar displays "NONAME00.CPP". The code editor contains the following C program:

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

The terminal window below shows the output: "c=30_". The taskbar at the bottom has icons for various applications like DEV, zm, and a browser, along with the Turbo C++ IDE icon. The system tray shows the date and time as 10:41 AM 27-Sep-24.

**C comes with both low level and high level features.
Hence it is a middle level language. Because of both
features using c we can develop system software and**

application software. Hence c is a **multi-purpose** programming language.

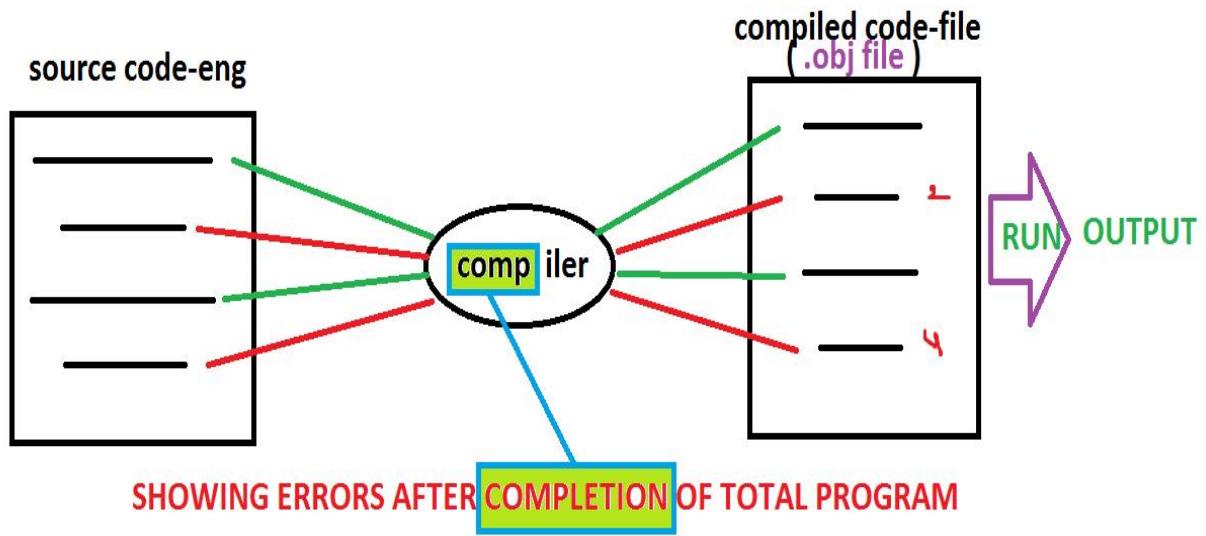
What is a compiler?



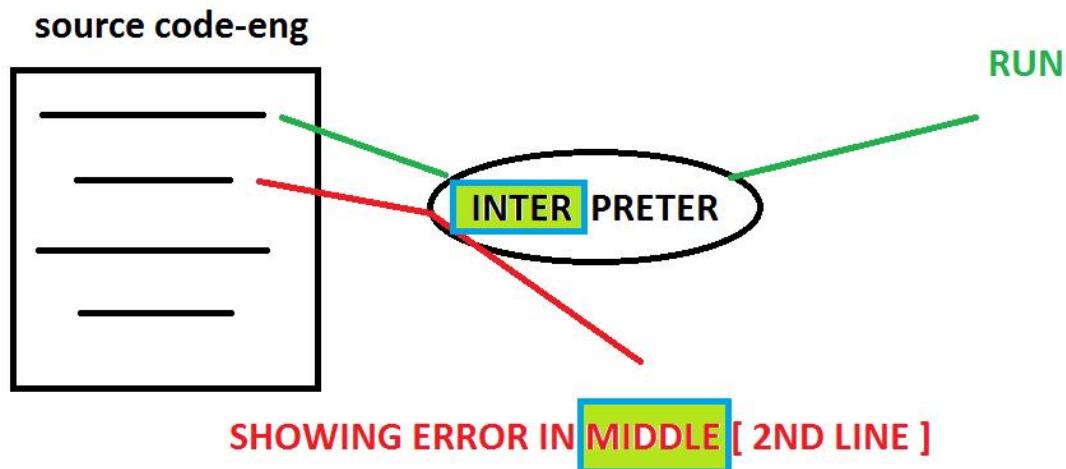
Always the user given instructions are in English, which is called source code or source program. But the machine understandable language is binary code / machine language. To convert the source code to binary code and to check the errors we are using the translators like Compiler / interpreter / assembler.

Compiler and interpreter both are used to convert high level programs to machine language [binary code].

Compiler converts the total program into binary code at once by leaving error lines.



Interpreter converts line by line.



Assembler is used to convert low level programs to binary code.

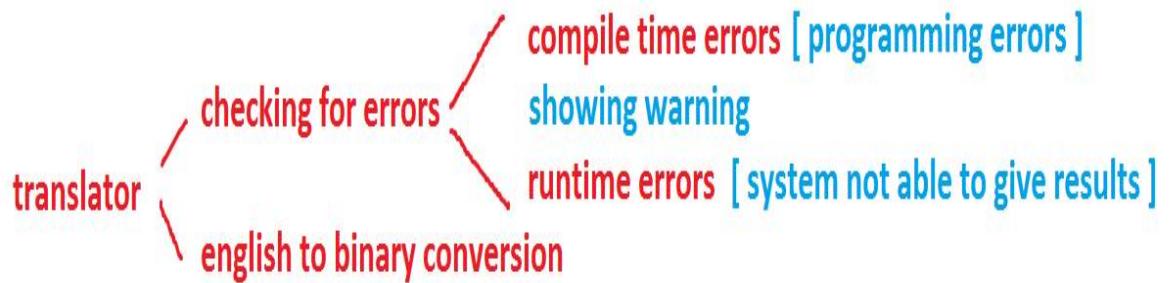
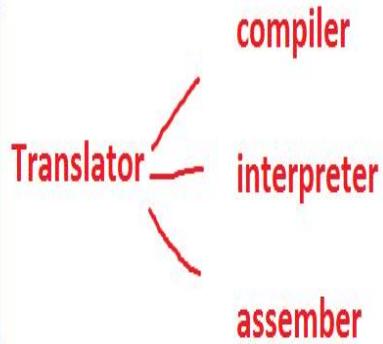
Assembler working style is similar to the compiler.

In c language we are using compiler as a interpreter.

Hence it is a compiler based programming language.

In java we are using both compiler and interpreter. Hence it is a compiler based interpreted language.

```
/* source code/ source program */  
#include<stdio.h>  
void main()  
{  
printf("Welcome To C");  
}
```



Example for compile time error:

A screenshot of a Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window shows a C program with a syntax error:

```
File Edit Run Compile Project Options Debug Break/watch
Error: Statement missing ; in function main
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("Welcome To C")
}
```

The error message "Error: Statement missing ; in function main" is displayed in red at the top of the terminal window. The desktop taskbar at the bottom shows various icons for applications like File Explorer, Calculator, and Google Chrome. The system tray indicates the date and time as 9:54 AM, 30-Sep-24.

Example for runtime error:

TC

File Edit Run Compile Project Options Debug Break/watch

Line 5 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C

```
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("%f",5.0);
}
```

5.000000

TC

Windows Taskbar icons: File Explorer, File Manager, Calculator, DEV, ZM, WS, Google Chrome, Paint, Snipping Tool, AVG, Task View.

9:58 AM 30-Sep-24

Windows Taskbar icons: File Explorer, File Manager, Calculator, DEV, ZM, WS, Google Chrome, Paint, Snipping Tool, AVG, Task View.

9:58 AM 30-Sep-24

TC

File Edit Run Compile Project Options Debug Break/watch

Line 5 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C

```
/* source code/ source program */
#include<stdio.h>
void main()
{
printf("%f",5);
}
```

Compiling

Main file: 9AM.C
Compiling: EDITOR → 9AM.C

	Total	File
Lines compiled:	234	234
Warnings:	0	0
Errors:	0	0

Available memory: 251K

Success : Press any key

Windows taskbar icons: File Explorer, Task View, Calculator, DEV, zm, File, Google Chrome, Paint, Snipping Tool, Internet Explorer, File History.

System tray: Battery, Volume, Network, Date: 9:57 AM, 30-Sep-24.

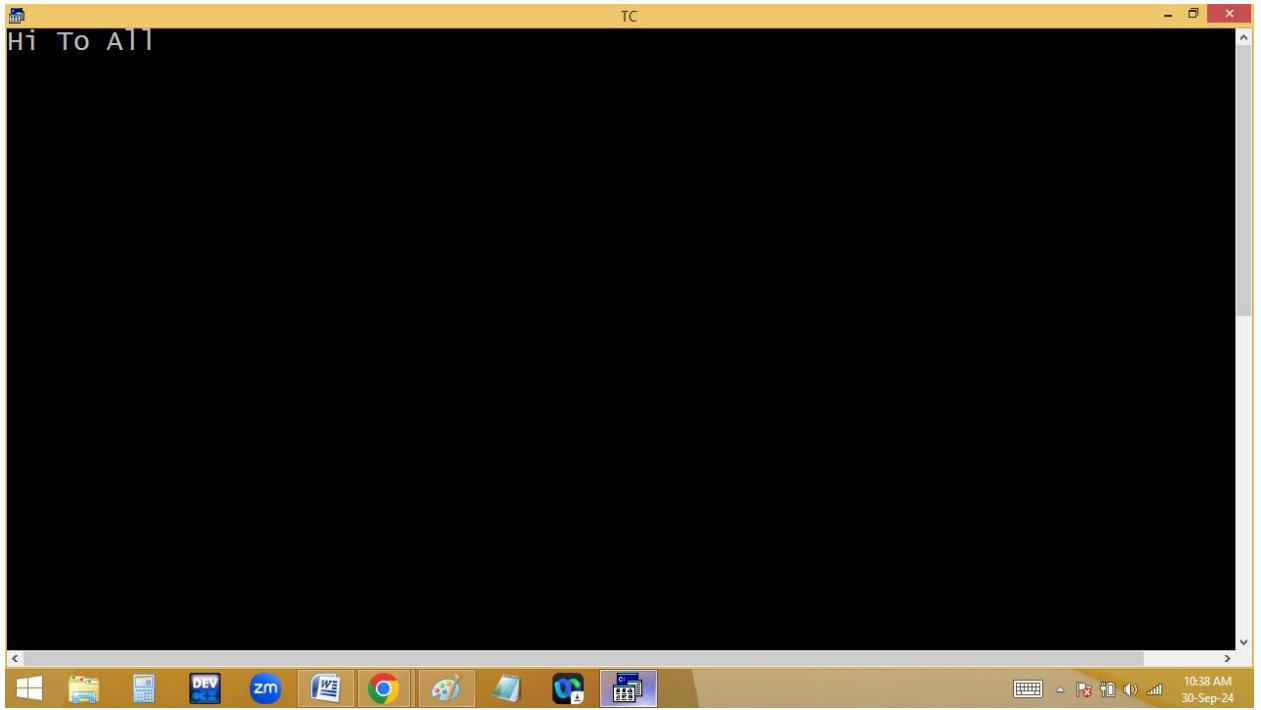
The image shows a Windows desktop environment with two windows open. The top window is a terminal window titled 'TC' with a black background. It displays the following text:

```
printf : floating point formats not linked
Abnormal program termination
```

The bottom window is a code editor titled 'TC' with a dark blue background. It displays the following C source code:

```
File Edit Run Compile Project Options Debug Break/watch
Warning: 'a' is assigned a value which is never used in function main
/* source code/ source program */
#include<stdio.h>
void main()
{
int a=100;
printf("Hi To All");
}
```

The taskbar at the bottom of the screen shows several pinned icons, including DEV, zm, WS, and others. The system tray indicates the date as 30-Sep-24 and the time as 10:38 AM.



What is called programming paradigm?

Every programming language comes with certain rules and regulations with a particular structure, which is technically called programming paradigm.

Before C language, the languages are using **monolithic programming paradigm**. Here the entire program they are creating by using a single program. Due to this it is very difficult to

1. Find the errors
2. Take more memory
3. Performance is low
4. No reusability
5. Program size increased

```
/* monolithic programming example */
#include<stdio.h>
void main()
{
printf("-----\n");
printf("good morning\n");
printf("-----\n");
printf("Welcome To C\n");
printf("-----\n");
printf("Thank You\n");
printf("-----");
}
```

```
good morning
-----
Welcome To C
-----
Thank You
-----
```

What is procedure oriented programming structure[POP's]: To avoid the drawbacks in monolithic programming problems, in C they have divided a big program into several small sub programs / sub routines /

procedures / functions / modules / structures. i.e. C program is collection of procedures, it is called POP's.

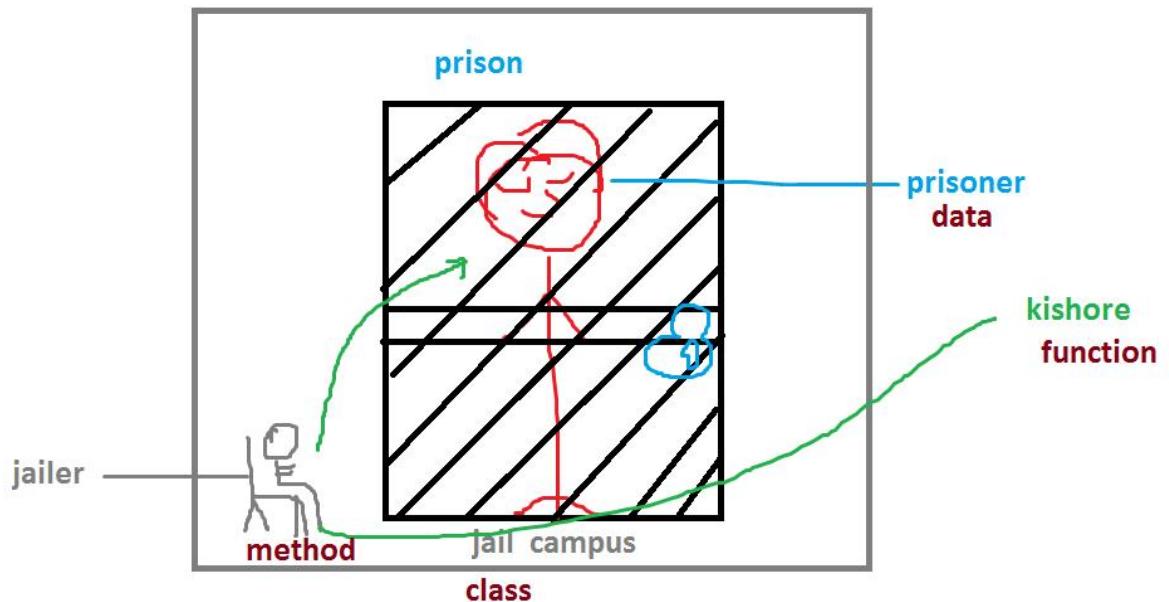
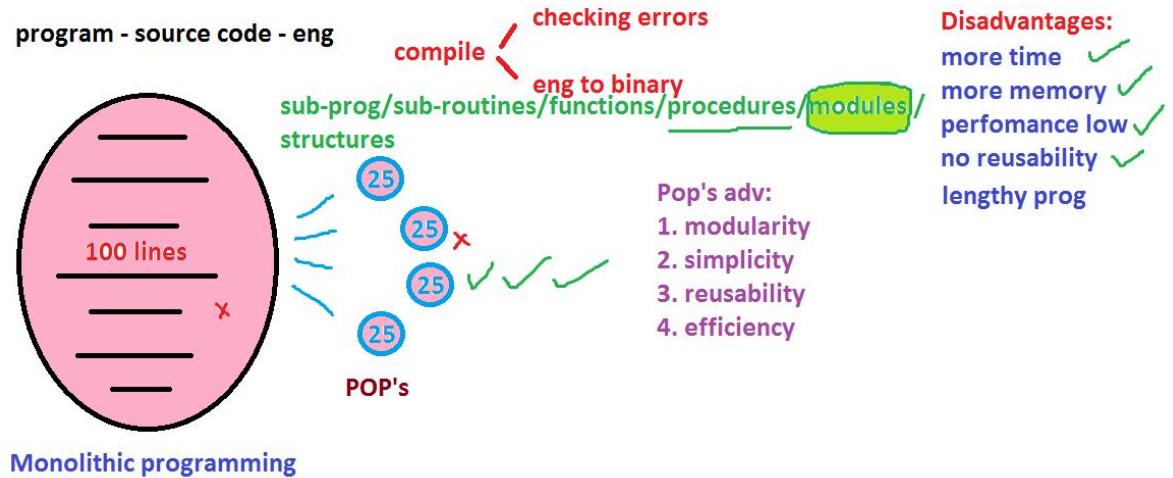
POP's Advantages:

- 1. Modularity:** Dividing big program into several small pieces as per the project requirement.
- 2. Simplicity:** easy to read and understand.
- 3. Reusability:** Write once, use many times.
- 4. Efficiency:** Performance is high.

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a blue background and displays the following text:

```
good morning
-----
Welcome To C
-----
Thank You
```

The desktop taskbar at the bottom shows various application icons, including DEV, zm, and a browser icon. The system tray indicates the date as 01-Oct-24 and the time as 10:12 AM.



POP's Disadvantages:

In C the data is not secured because of by default it is **public**.

OOP's:

Object Oriented Programming Structure

Features:

- 1. Class – It is a blue print to create the objects.**
- 2. Object: it is the physical instance/copy of class**
- 3. Data hiding – private / public / protected**
- 4. Encapsulation**
- 5. Inheritance**
- 6. Poly-many morphism-shapes / kinds / forms**
- 7. Abstraction - briefing**

class father – programmer – super / base class

{

200 lines

2 crore building;

};

Class newclass create from oldclass / sub / derived class

{

200 lines;

Class child derived from father

{

2 crore building

```
}
```

Class stu

```
{
```

```
...;
```

```
...;
```

```
}
```

Class emp

```
{
```

```
...;
```

```
...;
```

```
}
```

Why c is a general purpose language?

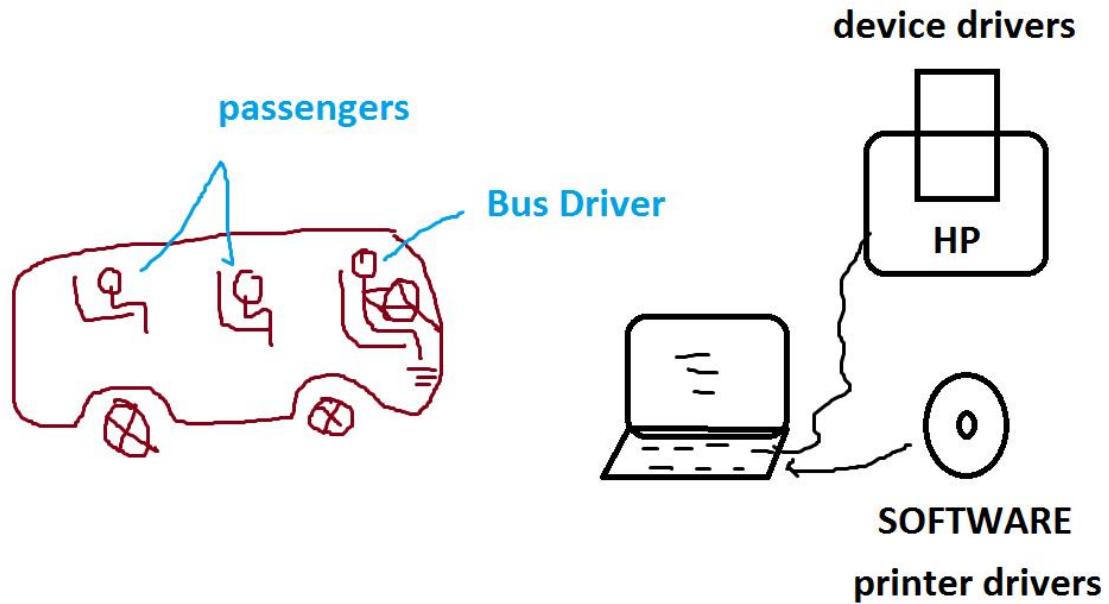
Using c language we can develop the software like

1. Operating systems

Eg: windows, mac, unix, android, ios,....

2. Device drivers

Eg: audio / video / usb
drivers,..



3. Translators

Eg: compiler, interpreter, assembler

4. Commercial applications

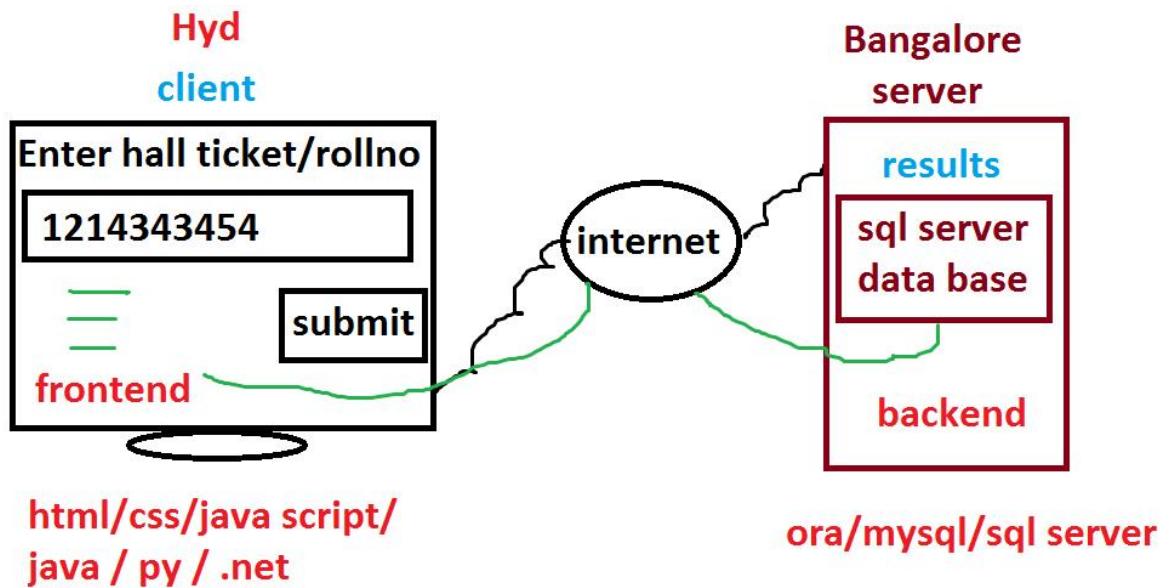
Eg: hotel/ super market / college programs

5. Editors

Eg: Notepad, wordpad, ms-word,...

6. Data base

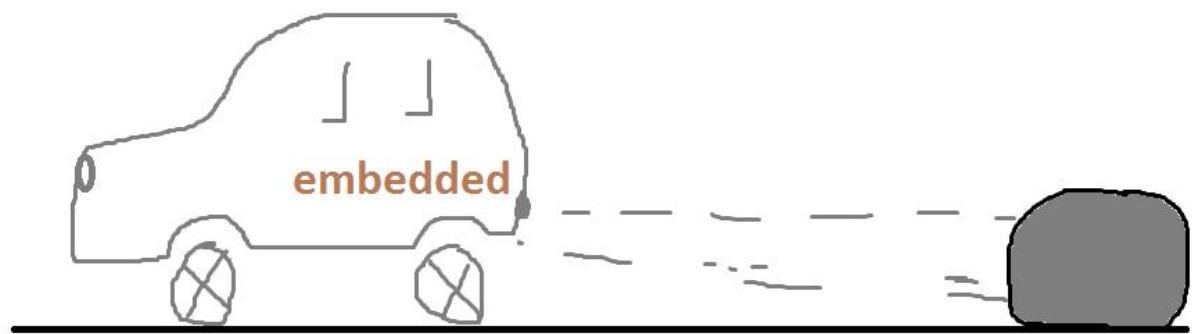
Eg: Oracle / SQL Server / My SQL / mongodb,...



7. Embedded applications

Eg:

Embedded s/w



8. Antivirus

Eg: avast, norton, mcafee, nod,...

9. Browsers

Eg: chrome, firefox,...

10. Media players

Eg: vlc, mx-player, windows media player,...

11. PC & Mobile games

12. Any type of standalone applications

Hence c is also called it is a **multi-purpose** programming language.

HISTORY OF C

Basically **C language** introduced in **1972**, by a software engineer named “**DENNIS RITCHIE**” working in **AT & T** [American Telephone & Telegraph] **Bell labs, located at murray hills, new jersey, USA.**

Ritchie adopted [taken] The compiler from **B compiler / B Language**, designed by “**KEN THOMSON**”, one of the software engineer in AT & T Bell labs.

Thomson adopted B language from **BCPL** [Basic Combined Programming Language], developed by an Assistant professor named “**MARTIEN RICHARDS**” in Cambridge University.

In **1989 ANSI** [American National Standards Institute] released a new version of C language with the name “**ANSI-C**”, which is familiar with the name “**C-89**”.

In **1999 ISO** [International Standard Organization] formerly known as **IOS** [International Organization for standardization] released a new version of c language with the “**C-99**”.

Basically C language designed for **Rewriting UNIX** operating system.

Nowadays we can create and execute a C program on any machine with any processor. i.e. we can execute the c programs on 80386 / 80486 / 80586 / intel core i3 / i5 / i7 / i9 / AMD Rayzon processors etc. Hence C is called it is a machine independent programming language.

For example the languages like 8086 / 8088 are working only on 8086 and 8088 processors. Hence they are called machine dependent programming languages.

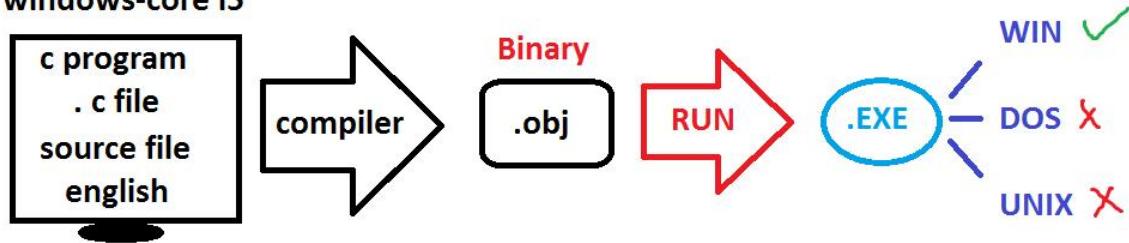
But C is a platform dependent programming language. i.e. the c applications designed for one operating system are not working in another type of operating systems. For example the C application designed for Window is not working in UNIX or Linux etc. Due to this problem, using C language we can't design web applications. C is a machine independent but platform dependent, it is also called partial portable language. Because of this problem by using C we can develop only the standalone applications.

Standalone applications installed in a single system and operated from that system only.

The languages like Java / .Net / Python are platform independent and machine independent. Hence they are called portable languages and they are used to develop both web applications and standalone applications.

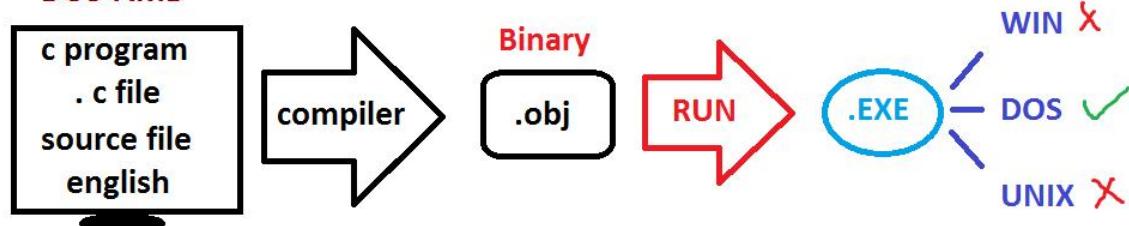
Web applications are installed in a web server and access across the world by using the web clients.

windows-core i5



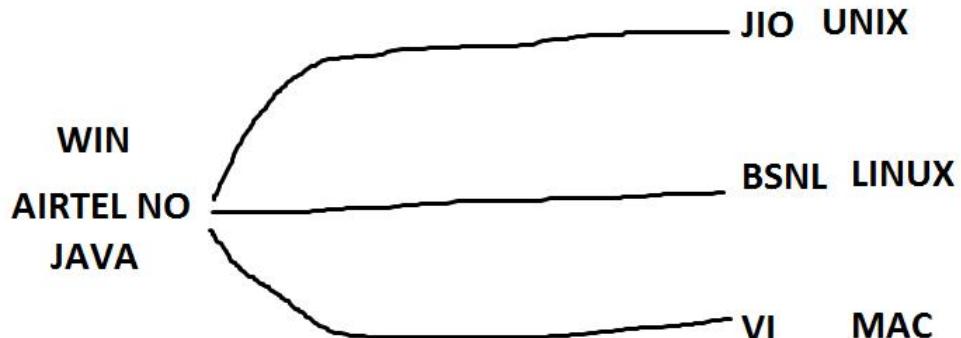
MACHINE INDEPENDENT **PARTIAL PORTABILITY** **PLATFORM DEPENDENT**

DOS-AMD



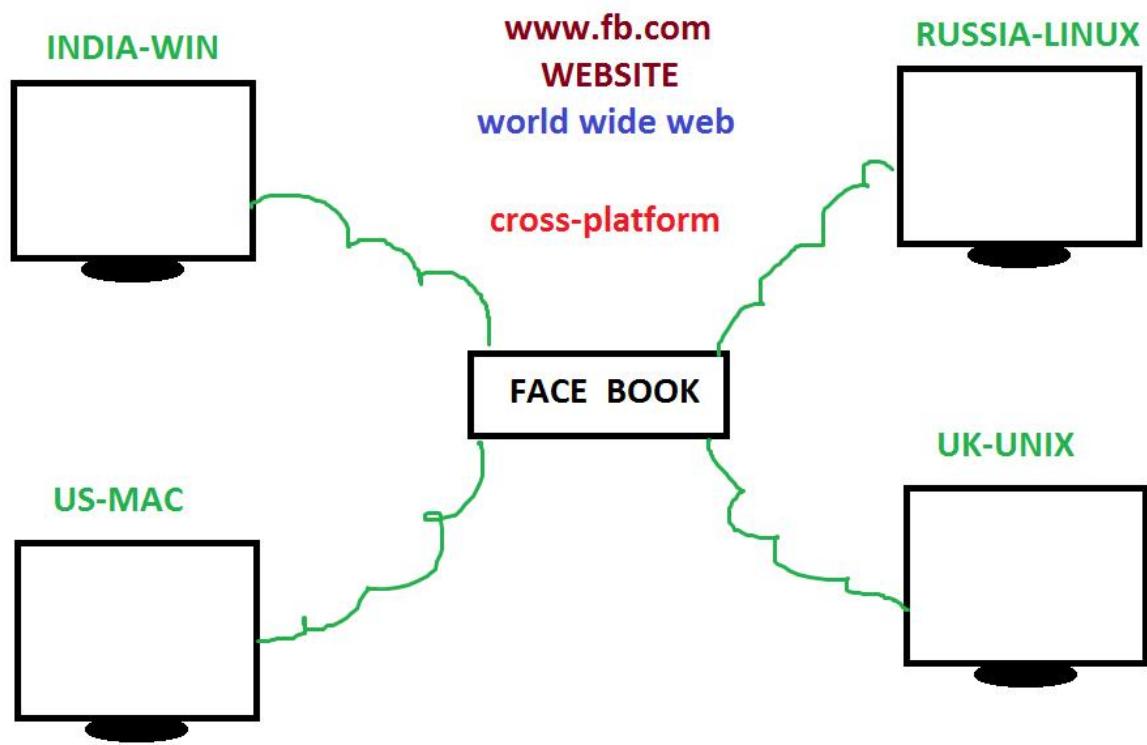
M N P

Mobile No Portability

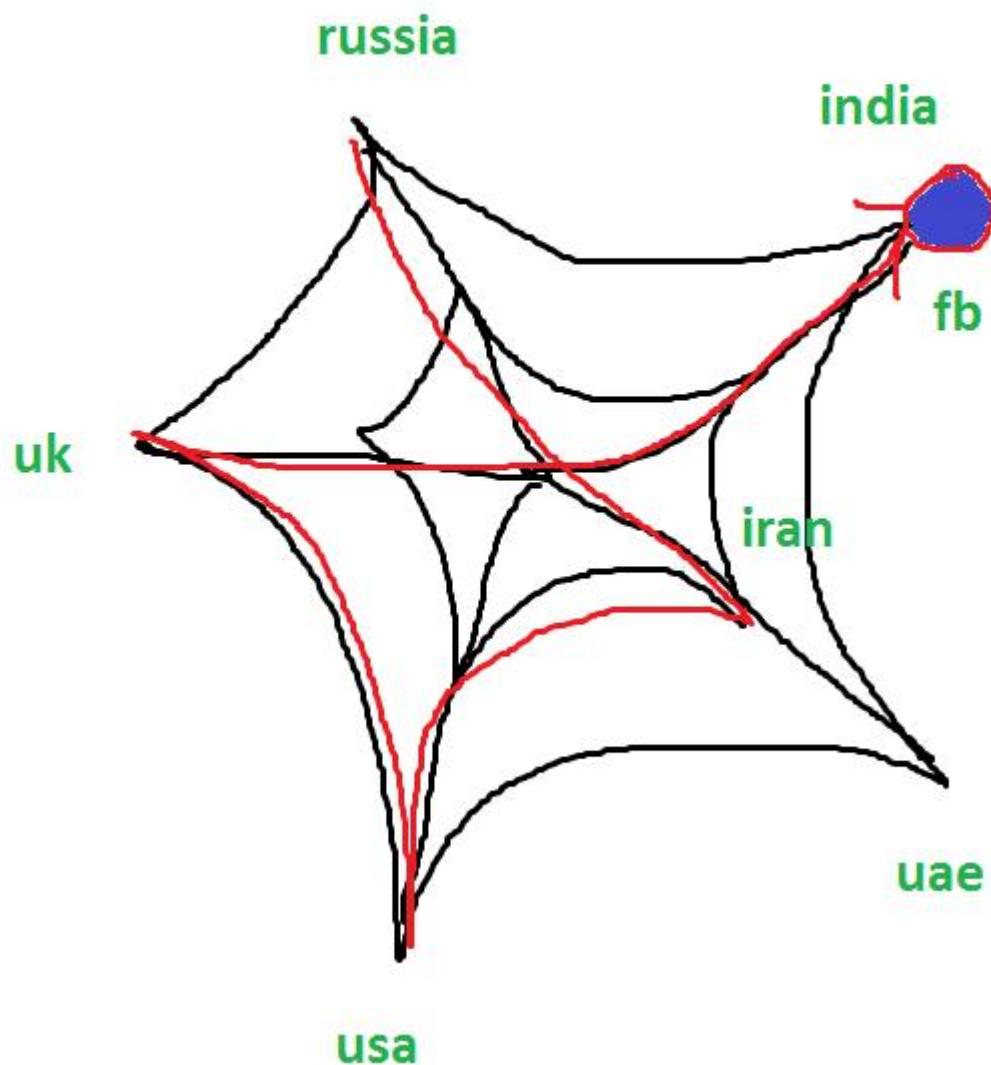


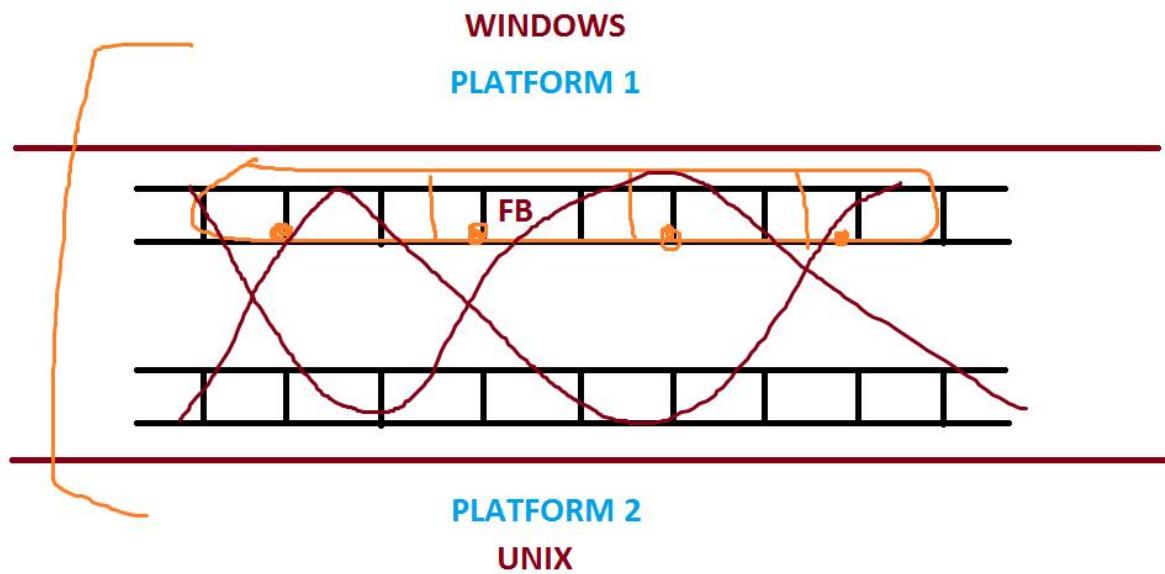
MACHINE INDEPENDENT & PLATFORM INDEPENDENT

WORA - WRITE ONCE RUN ANYWHERE



world wide web





FUNDAMENTALS OF C

C CHARACTER SET: Every programming language having a particular character set and by using this character set only we can make the programs [software]. C uses ASCII character set, which comes with 256 characters. In this we are having 52 alphabets [a-z, A-Z], 10 digits [0-9], 44 operators[+,-, *,...], 14 separators [, . : ; “ ” ‘ ’ ()..] and remaining all are special characters.

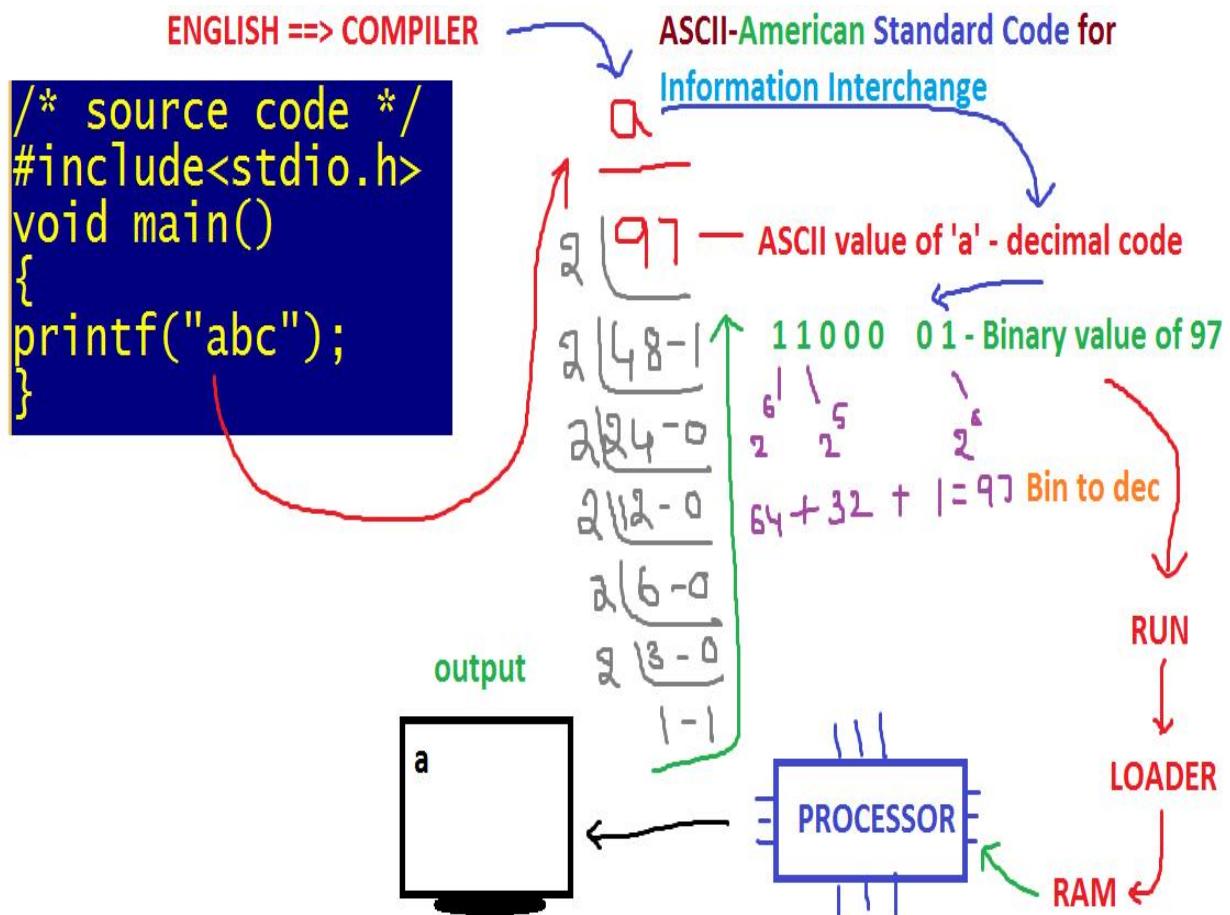
English language	C language
26 alphabets	ASCII characters-256
English words	C keywords - 32
English sentences	Instructions
English paragraphs	Programs
English documents	Software

CHARACTERS	ASCII VALUES
a-z	97-122
A-Z	65-90
0-9	48-57
Space	32
Back space	8
Tab key	9
Enter	10

Esc	27
*	42
+	43

ASCII – American Standard Code for Information Interchange – 256 characters – IBM Corporation [International Business Machines] American company

Java / Py / .Net – Unicode Characters – Universal code- 65536 characters



C-TOKENS

The smallest individual words we are using in developing a c program are called C-tokens. They are of different types.

1. **Keywords**: The system predefined / reserved words are called keywords. Each keyword is having certain meaning and as a user we can't change this meaning. C comes with 32 keywords.

Eg: auto, break, continue, char, case, const, do, default, double, enum, else, extern, float, for, goto, int, long, while, switch, short, unsigned, union,...

Installation of Turbo C++:

Dev C++ / VS Code / code blocks / free c / online compiler

Open a browser [chrome / edge]

Type turbo c++ by akki

A screenshot of a Google search results page. The search query "turbo c++ by akki" is entered in the search bar. The results are filtered under the "All" tab. The top result is highlighted with an orange border and shows the following information:

TurboC 7 Download
https://turboc-7-by-akki.software.informer.com › down... :

Download TurboC 7 by AKKI - Informer Technologies, Inc.
A driver for a PC component caching large amounts of frequently used data. ... **Get centralized access to many Windows 10 functions and features.** ... Relocates ...

Below this result, another entry is partially visible:

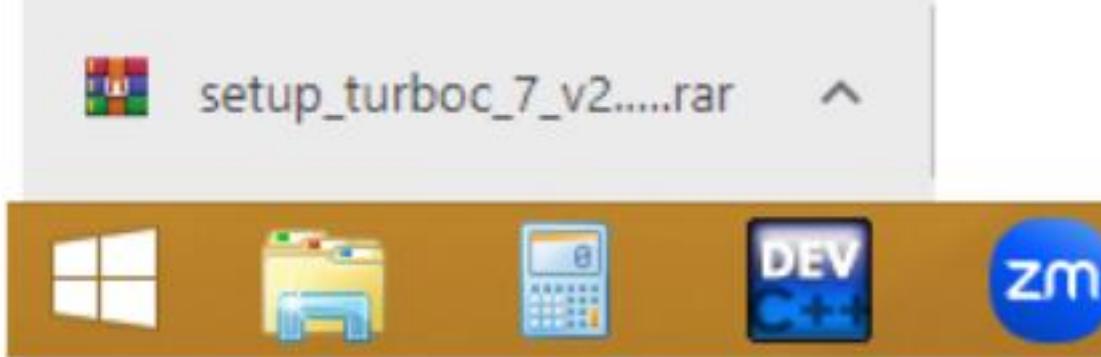
TurboC 7 Download
https://turboc-7-by-akki.software.informer.com :

TurboC 7 Download - With this program
28 Sept 2024 — Run Turbo C in full-screen mode without errors and without manually closing DosBox each time. Works on every modern Windows version.

Click on download turboc 7 by akki link or hold control button and click on below link

<https://turboc-7-by-akki.software.informer.com/download/>

2. Start the Installation



Download winrar or any unzip software.

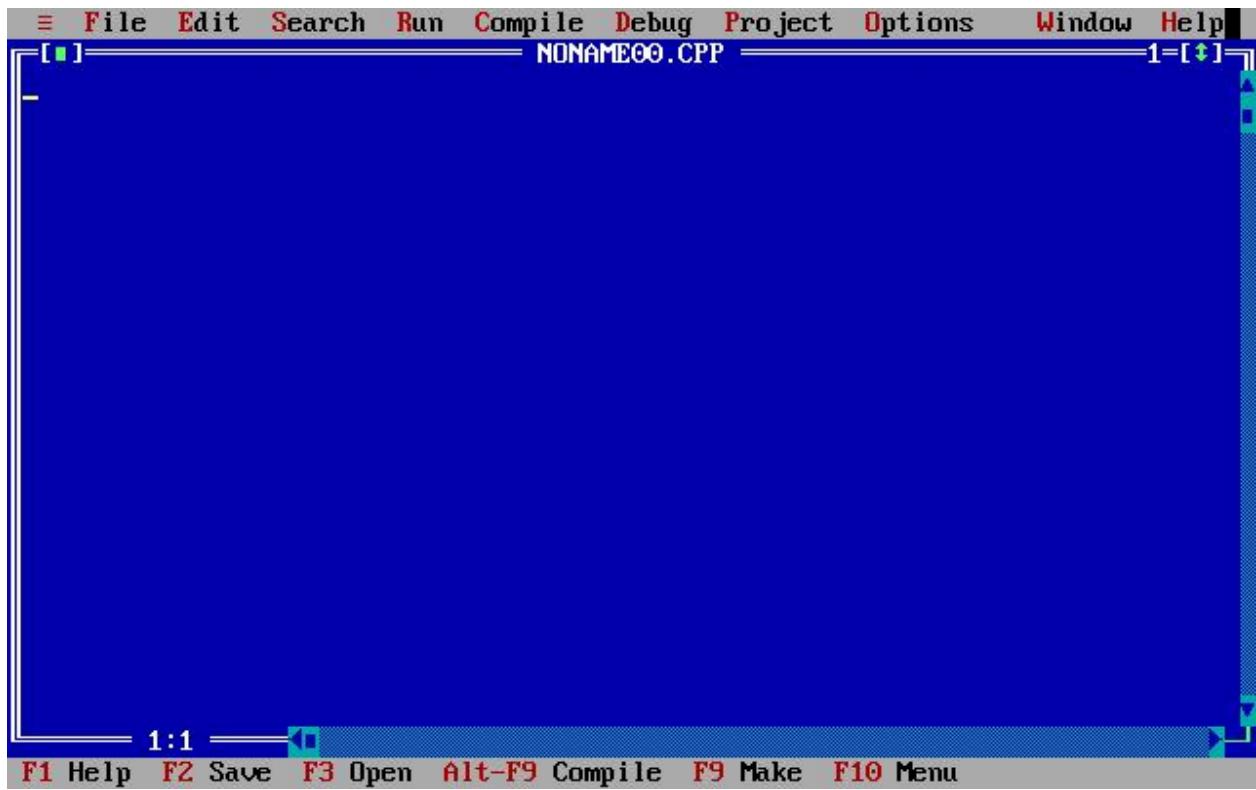
Click on setup_turboc_7_V2...rar file

Double click on Setup_TurboC_7_v2.1.exe

Click on yes ➔ next ➔ next ➔ next ➔ next ➔ Install ➔ Finish

Now a blue window is displayed as follows, which is called

IDE – Integrated Development Environment / Blue screen / Editor.



To get full / half screen alt+enter key

Sample program:

A screenshot of a C/C++ integrated development environment (IDE). The main window shows a code editor with the following code:

```
#include<stdio.h>
void main()
{
printf("Good morning");
}
```

The status bar at the bottom displays the time as 5:12 and provides keyboard shortcuts for various functions:

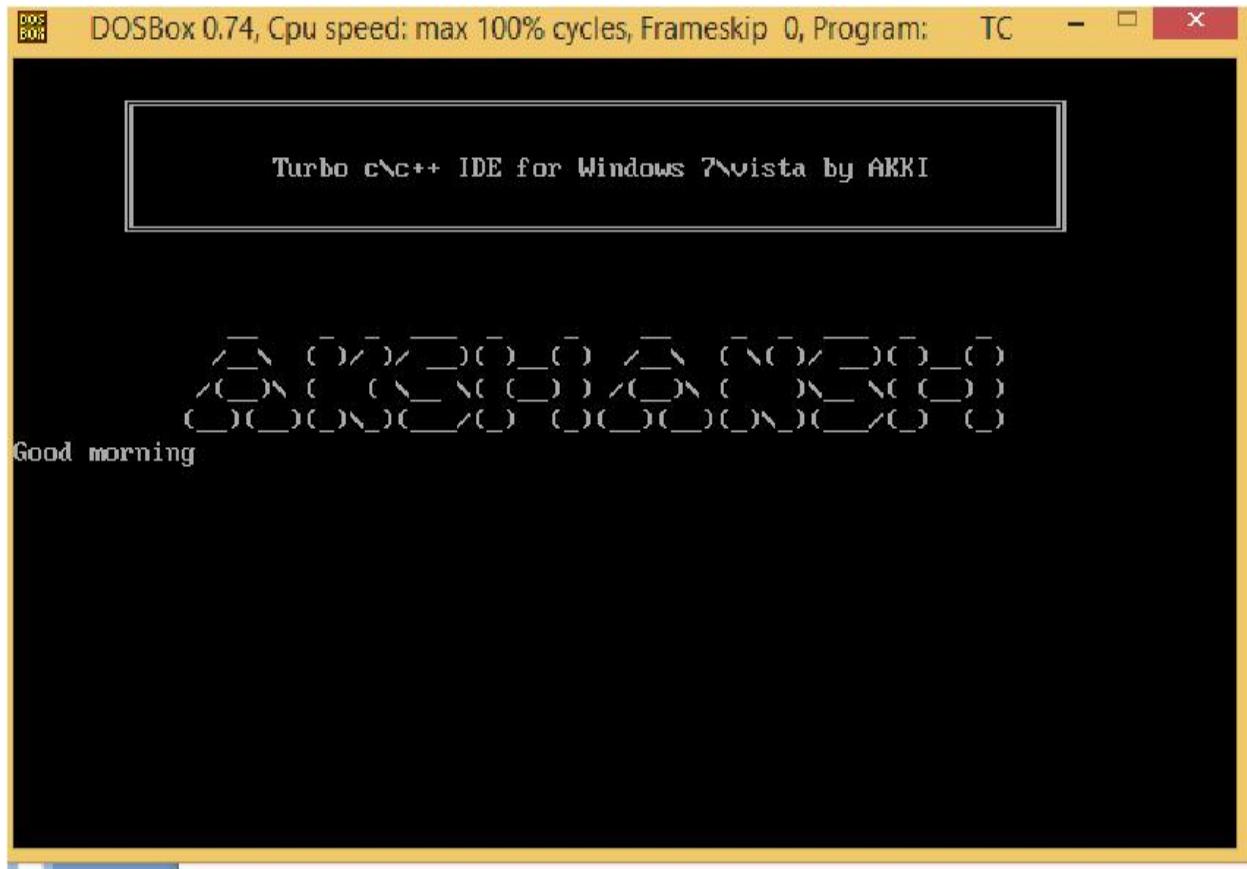
F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

Save the program ➔ F2 / Fn+F2 / file menu and select save or alt+f select save

Compile the file ➔ Alt+f9 or Alt+C and compile

Run the program ➔ Ctrl+F9 or Alt+R and run

To get the output ➔ Alt+F5 or Alt+w and user screen



2nd program:

Click on file ==> select new or alt+f → new

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Search, Run, Compile, Debug, Project, Options, Window, and Help. Two files are open: 91.CPP and 92.CPP. The code in 92.CPP is:

```
#include<stdio.h>
void main()
{
    printf("Thank you");
}
```

The status bar at the bottom shows F1 Help, Alt-F8 Next Msg, Alt-F7 Prev Msg, Alt-F9 Compile, F9 Make, and F10 Menu. The current line is 5:2.

The screenshot shows a DOSBox window titled "DOSBox 0.74". The window title bar also displays "DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC". The output window contains the text:

```
Turbo c\c++ IDE for Windows 7\vista by AKKI
```

Good morningThank you

The screenshot shows a software interface with a menu bar at the top and two code files open in windows below. The menu bar includes File, Edit, Search, Run, Compile, Debug, Project, Options, Window, and Help. The title bar for the active window shows "91.CPP" and "1". The other window shows "92.CPP" and "2=[↑]". The code in 91.CPP is:

```
#include<stdio.h>
#include<conio.h> // console input output header file
void main()
{
clrscr();
printf("Thank you");
}
```

The status bar at the bottom displays the time "2:54" and various keyboard shortcuts: F1 Help, Alt-F8 Next Msg, Alt-F7 Prev Msg, Alt-F9 Compile, F9 Make, and F10 Menu.

Thank you

The screenshot shows a vintage-style C/C++ development environment. The menu bar includes File, Edit, Search, Run, Compile, Debug, Project, Options, Window, and Help. Two files are open: 91.CPP and 92.CPP. The code in 91.CPP is as follows:

```
#include<stdio.h>
#include<conio.h> // console input output header file
void main()
{
clrscr();
printf("Thank you");
getch();
}
```

The status bar at the bottom displays the time as 8:41 and various keyboard shortcuts: F1 Help, Alt-F8 Next Msg, Alt-F7 Prev Msg, Alt-F9 Compile, F9 Make, and F10 Menu.

Thank you_

Identifiers: identifiers are nothing but names of variables , functions, files, array, pointer etc.

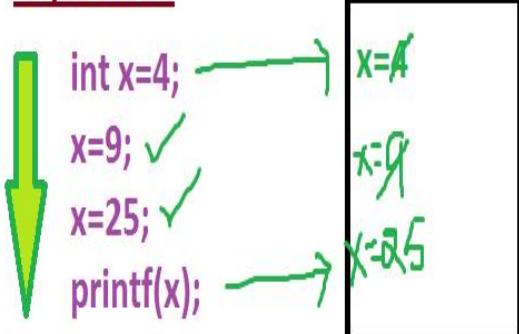
Example for variables:

int a=10; a and b are used to identify 10 and 14. hence they are identifiers
int b=14;

containers = variables

RAM

Top-Down



we can change x value at anytime.

x is change + ready

[vary + able = variable]

every variable is a container because of it contain the values

Example for files:

a.c, b.cpp, c.java, d.py, e.txt,....

Example for functions:

function names

```
void sum()  
{  
...;  
}
```

```
void div()  
{  
...;  
}
```

Example for array:

int a[20]; int array variable

Example for pointer:

Int * a; int pointer variable

Naming rules:

1. Name should have to start with alphabet or underscore [_].

TC

File Edit Run Compile Project Options Debug Bre
Line 4 Col 1 Insert Indent Tab Fill Unindent * E:NON

```
#include<stdio.h>
void main()
{
    int z; /* var declaration */
}
```

Compiling

Main file: NONAME.C
Compiling: EDITOR → NONAME.C

	Total	File
Lines compiled:	218	218
Warnings:	0	0
Errors:	0	0

Available memory: 251K

Success : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 11 of 11 Words: 225

Windows Taskbar icons: File Explorer, File Manager, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, Snipping Tool, File History, Task Scheduler.

System tray: Keyboard, Mouse, Battery, Signal strength, 120%, 10:37 AM, 07-Oct-24

A screenshot of a Windows desktop environment. In the center is a terminal window titled "Compiling" with a black background and white text. The terminal displays the following output:

```
Main file: NONAME.C
Compiling: EDITOR → NONAME.C

      Total     File
Lines compiled: 216     216
  Warnings: 0       0
    Errors: 1       1

Available memory: 251K
Errors : Press any key
```

The terminal window has a blue border. Below it is a standard Windows taskbar with various icons and system status indicators. The desktop background is dark blue.

```
#include<stdio.h>
void main()
{
int 1z; /* var declaration */
}
```

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar shows Line 5, Col 11, Insert, Indent, Tab, Fill, Unindent, and E:NONAME.C. The code editor contains the following C code:

```
#include<stdio.h>
void main()
{
    int _z; /* var declaration */
}
```

A modal dialog box titled "Compiling" displays the following output:

```
Main file: NONAME.C
Compiling: EDITOR → NONAME.C

      Total     File
Lines compiled: 218     218
  Warnings: 0       0
    Errors: 0       0

Available memory: 251K
```

The status bar at the bottom shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Me. The taskbar at the bottom right includes icons for File Explorer, Task View, Start, Taskbar settings, and system status.

2. Numbers allowed but not at first position.

A screenshot of Microsoft Visual Studio Code showing a C program and its linking output. The code editor shows a simple C program:

```
#include<stdio.h>
void main()
{
int z7; /* var declaration */
}
```

The status bar at the top indicates "Line 4 Col 8". A terminal window titled "Linking" displays the linking process:

```
EXE file : NONAME.EXE
Linking : LIB\CS.LIB

Total      Link
Lines compiled: 218    PASS 2
Warnings: 0          0
Errors: 0           0

Available memory: 251K
Success : Press any key
```

The status bar at the bottom shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Me.

3. Spaces not allowed.

A screenshot of a Windows desktop environment. In the center is a terminal window titled "Compiling" with a gray background. The terminal displays the following text:

```
Main file: NONAME.C
Compiling: EDITOR → NONAME.C

      Total      File
Lines compiled: 216      216
      Warnings: 0      0
      Errors: 1      1

Available memory: 250K
Errors : Press any key
```

The terminal window has a yellow header bar with menu items: File, Edit, Run, Compile, Project, Options, Debug, Break, Line 4, Col 17, Insert, Indent, Tab, Fill, Unindent, * E:NONAME.C. Below the terminal is a taskbar with various icons and system status information.

4. No special character except underscore.

TC

File Edit Run Compile Project Options Debug Bre

Line 6 Col 11 Insert Indent Tab Fill Unindent * E:NON

```
#include<stdio.h>
void main()
{
int _a_b_ ; /* var declaration */
}
```

Compiling

Main file: NONAME.C
Compiling: EDITOR → NONAME.C

	Total	File
Lines compiled:	218	218
Warnings:	0	0
Errors:	0	0

Available memory: 250K

Success : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 15 of 16 | Words: 243 | 120% 10:40 AM 07-Oct-24

A standard Windows taskbar at the bottom of the screen, showing various application icons including File Explorer, Edge, Google Chrome, and others.

A screenshot of a Windows desktop environment. In the foreground, a code editor window titled 'TC' is open. The menu bar includes 'File', 'Edit', 'Run', 'Compile', 'Project', 'Options', 'Debug', and 'Break'. A red error message at the top of the editor window reads: 'Error: Illegal character '\$' (0x24) in function main'. The code in the editor is:

```
#include<stdio.h>
void main()
{
int _a$b_ ; /* var declaration */
}
```

The keyboard status bar at the bottom shows: F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me. The taskbar below the desktop shows various pinned icons, including a browser, file explorer, and system tools. The system tray indicates the date as 07-Oct-24 and the time as 10:40 AM.

5. Keywords are not allowed.

A screenshot of a Windows desktop environment. In the foreground, a code editor window titled 'TC' is open. The menu bar includes 'File', 'Edit', 'Run', 'Compile', 'Project', 'Options', 'Debug', and 'Break'. A red error message 'Error: Declaration syntax error in function main' is displayed at the top of the editor window. The code in the editor is:

```
#include<stdio.h>
void main()
{
int while ;
}
```

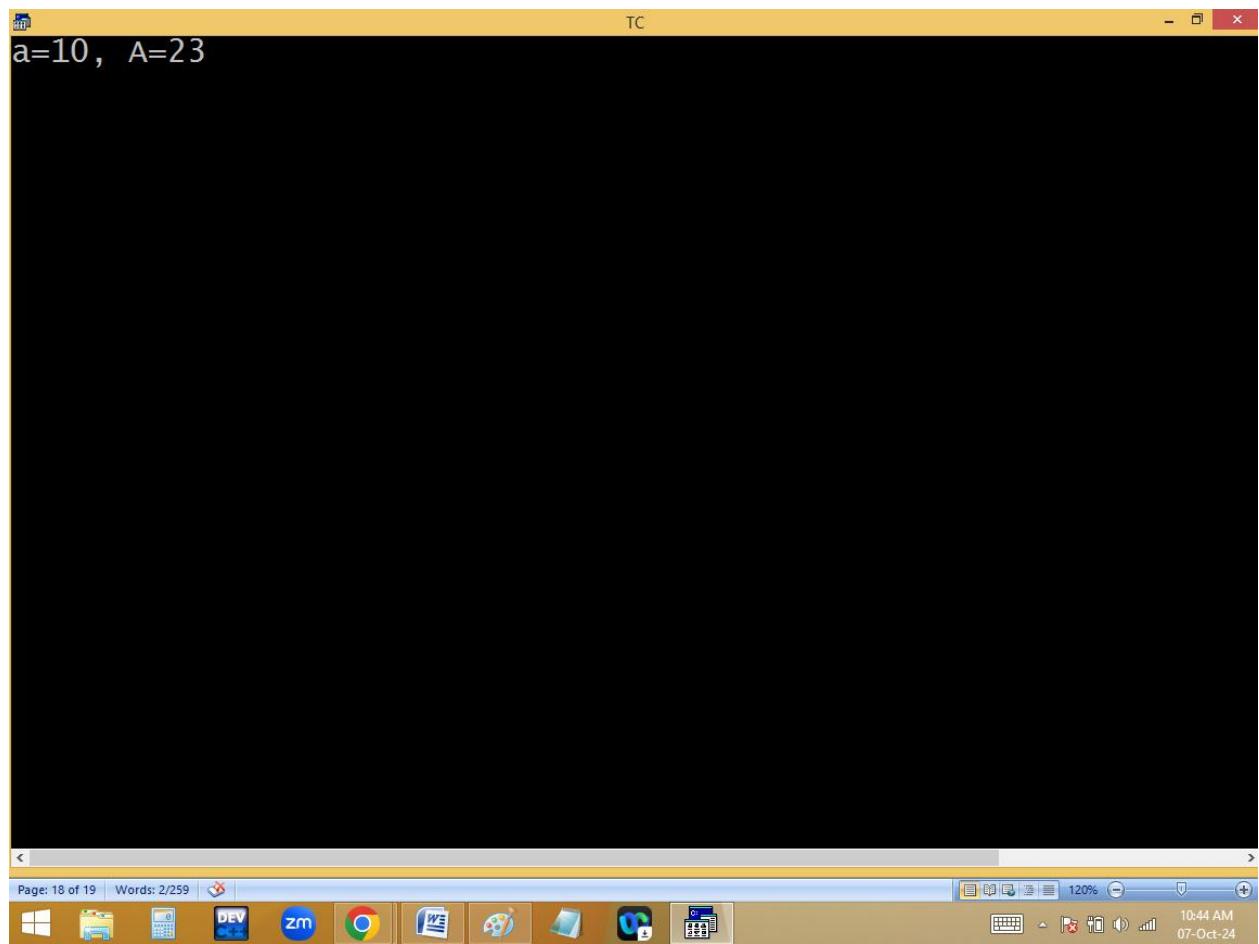
The keyboard status bar at the bottom shows 'F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me'. The taskbar at the bottom displays various icons for applications like File Explorer, Task View, and Microsoft Edge, along with system icons for battery, signal, and volume. The system tray shows the date and time as '07-Oct-24'.

6. Names are case sensitive. i.e. lower and upper are different.

A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C). The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. Below the menu bar, status text shows "Line 9 Col 9 Insert Indent Tab Fill Unindent * E:NON". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=10;
    int A=23;
    clrscr();
    printf("a=%d, A=%d",a,A);
    getch();
}
```

The keyboard shortcut bar at the bottom of the window lists F1-Help through F10-Make. The taskbar at the bottom of the screen shows various pinned icons, including a browser, file explorer, and system tools. The system tray shows the date and time as 10:44 AM on 07-Oct-24.



7. Duplicate names not allowed in same function or block { }.

TC

File Edit Run Compile Project Options Debug Bre
Line 5 Col 14 Insert Indent Tab Fill Unindent * E:9AM

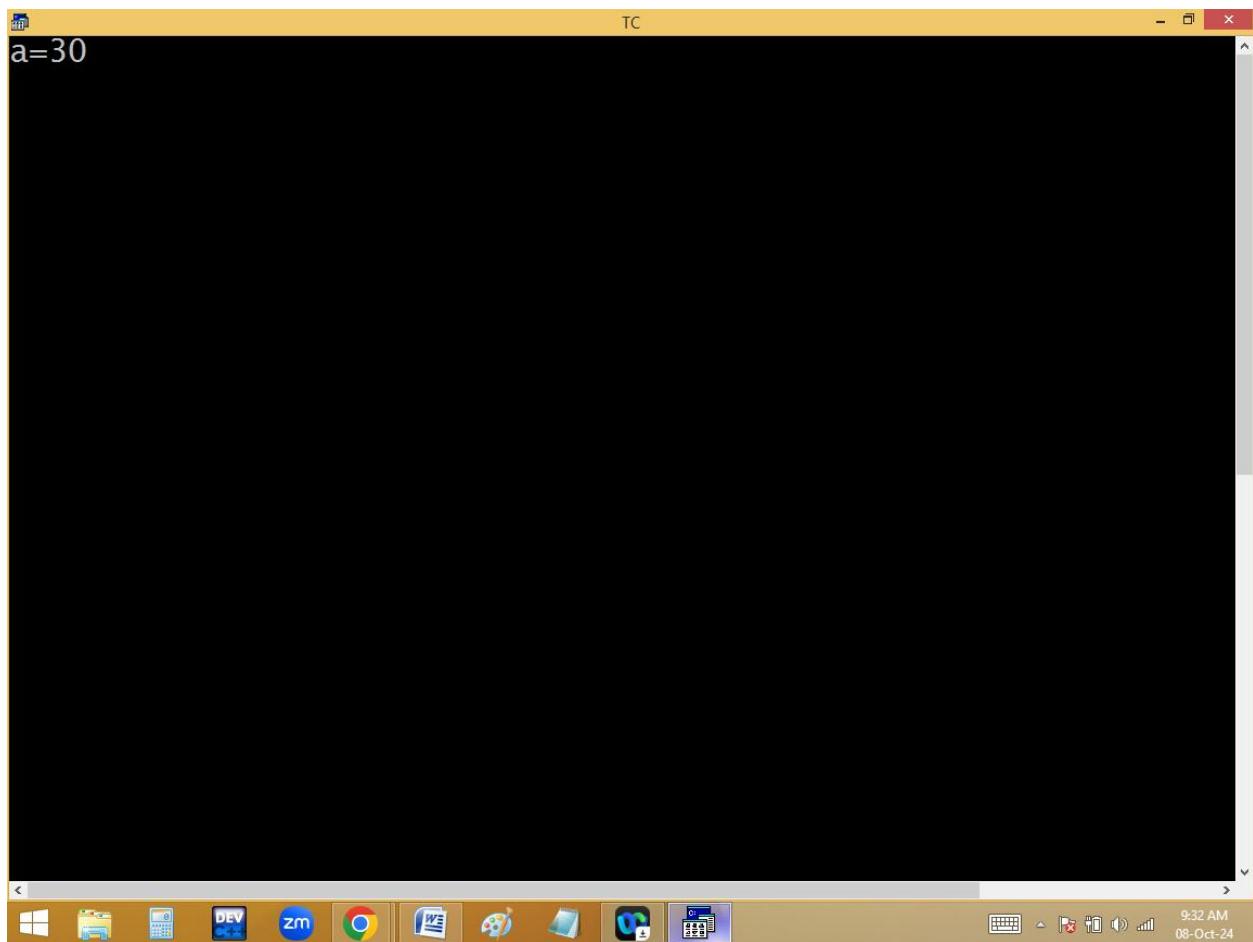
```
#include<stdio.h>
void main()
{
int a=10; /* var declaration */
a=20; /* var initialization */
a=30;
printf("a=%d",a);
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 1 of 1 Words: 4/12

Windows Taskbar icons: File Explorer, File Manager, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, OneDrive, File History.

System tray: Keyboard, Battery, Signal, 9:31 AM, 08-Oct-24



TC

File Edit Run Compile Project Options Debug Bre

Error: Redefinition of 'a' in function main

```
#include<stdio.h>
void main()
{
int a=10; /* var declaration */
int a=20; /* var declaration */
int a=30;
printf("a=%d",a);
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 3 of 3 Words: 12

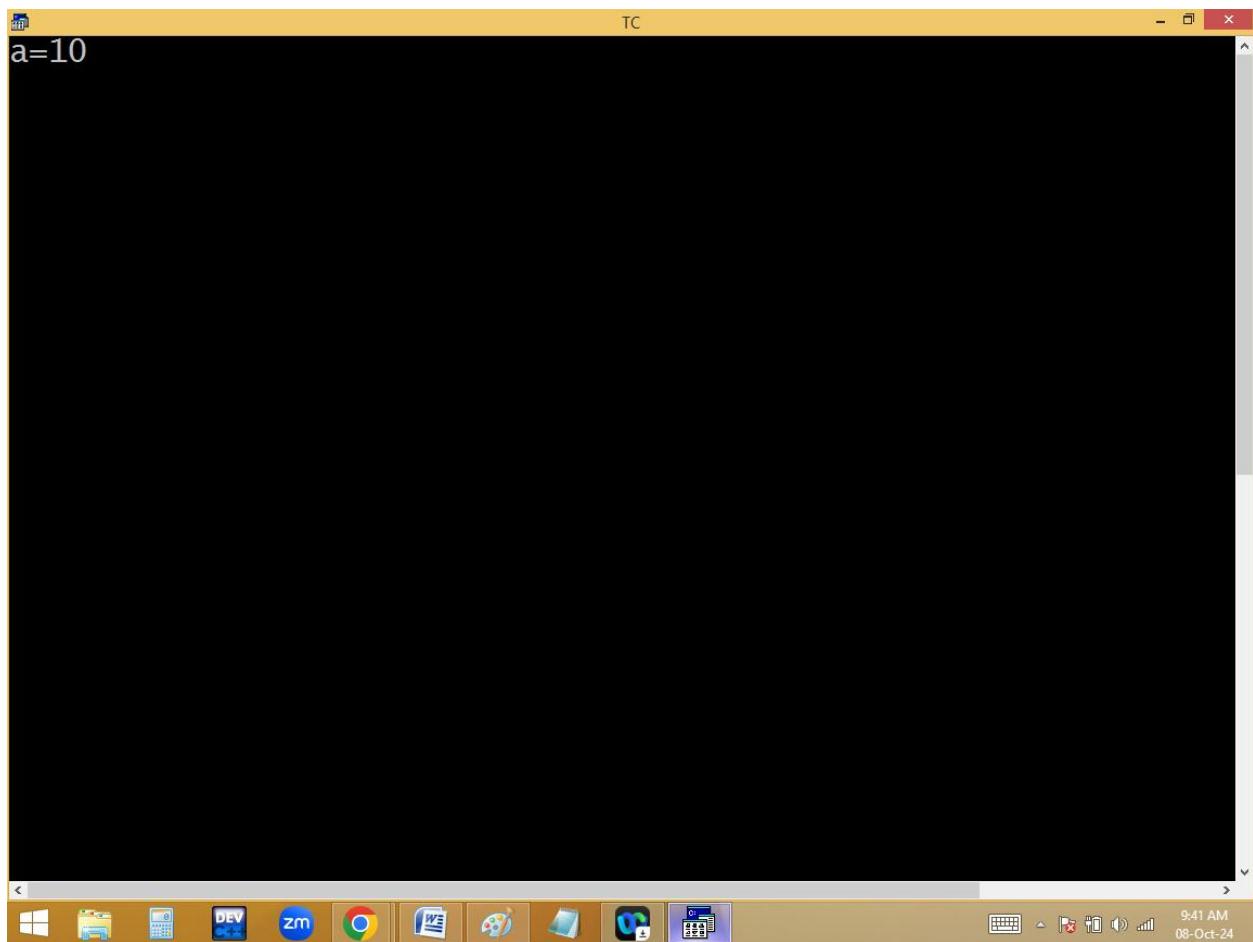
Windows Taskbar icons: File Explorer, File Manager, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, OneDrive, File History, Task Scheduler.

System tray: Battery, Volume, Network, Date/Time (9:32 AM, 08-Oct-24).

A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C). The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom shows "Line 5 Col 2 Insert Indent Tab Fill Unindent * E:9AM". The code in the editor is:

```
#include<stdio.h>
void show()
{
int a=30;
}
void main()
{
int a=10; /* var declaration */
printf("a=%d",a);
}
```

The keyboard status bar at the bottom of the window lists function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. Below the window is a taskbar with various icons, including the Start button, File Explorer, Task View, DEV, Zoom, Google Chrome, FileZilla, Paint, Snipping Tool, and File Manager. The system tray shows the date and time as 08-Oct-24.



8. Name may contain up to 32 characters and excess characters ignored by the compiler.

TC

File Edit Run Compile Project Options Debug Bre
Line 6 Col 1 Insert Indent Tab Fill Unindent * E:9AM

```
#include<stdio.h>
void main()
{
int abcdefghijklmnopqrstuvwxyz1234567890;
```

Compiling

Main file: 9AM.C
Compiling: EDITOR → 9AM.C

	Total	File
Lines compiled:	233	233
Warnings:	0	0
Errors:	0	0

Available memory: 250K
Success : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 6 of 6 | Words: 27 | 90% 9:44 AM 08-Oct-24

TC

```
File Edit Run Compile Project Options Debug Bre  
Error: Redeclaration of 'abcdefghijklmnopqrstuvwxyz123456' in fu  
#include<stdio.h>  
void main()  
{  
int abcdefghijklmnopqrstuvwxyz1234567890;  
int abcdefghijklmnopqrstuvwxyz1234567890;  
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me >

Page: 7 of 7 Words: 27



90% 9:45 AM 08-Oct-24

TC

```
File Edit Run Compile Project Options Debug Bre  
Error: Redeclaration of 'abcdefghijklmnopqrstuvwxyz123456' in fu  
#include<stdio.h>  
void main()  
{  
int abcdefghijklmnopqrstuvwxyz1234567890;  
int abcdefghijklmnopqrstuvwxyz123456;  
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me >

Page: 8 of 8 | Words: 27 | 90% 9:47 AM 08-Oct-24



The screenshot shows the Turbo C++ IDE interface. The code editor window displays the following C program:

```
#include<stdio.h>
void main()
{
    int abcdefghijklmnopqrstuvwxyz1234567890;
    int abcdefghijklmnopqrstuvwxyz12345;
}
```

The status bar at the top indicates: Line 5 Col 36 Insert Indent Tab Fill Unindent * E:9AM. A tooltip "Compiling" is visible over the status bar. A message box titled "Compiling" contains the following output:

Main file: 9AM.C
Compiling: EDITOR → 9AM.C

	Total	File
Lines compiled:	250	250
Warnings:	0	0
Errors:	0	0

Available memory: 250K
Success : Press any key

The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 08-Oct-24.

3. Constants: Fixed values are called constants. We can't change a constant value during program execution. i.e. constant value should be provided at the time of declaration only.

Eg:

Numerical constants:

```
const int rollno=1234;
```

```
const float pi=3.14;
```

character constants:

```
const char name[ ]="Ravi"; ← string
```

```
const char gender = 'M'; ← char
```

TC

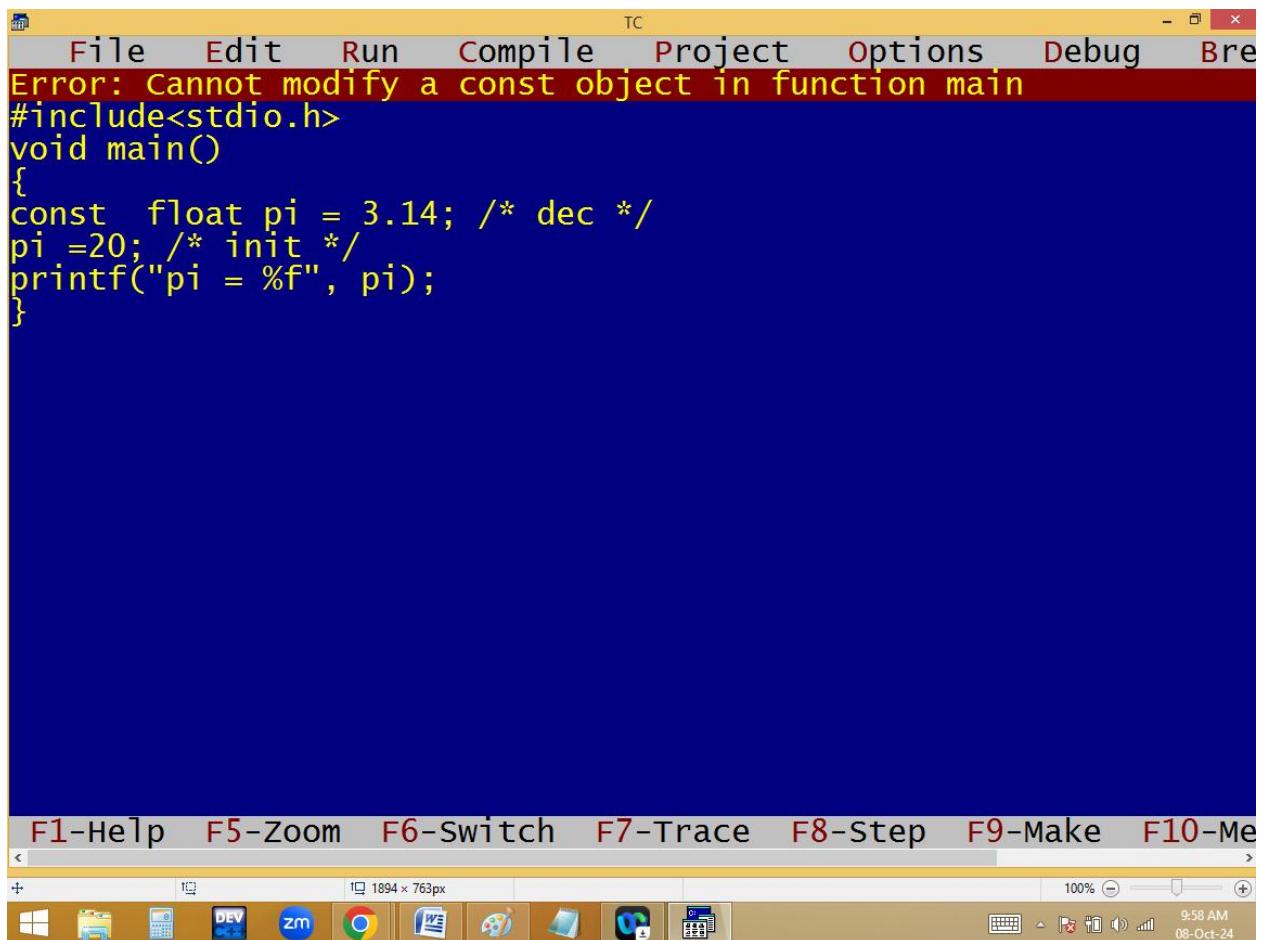
File Edit Run Compile Project Options Debug Bre

Error: Cannot modify a const object in function main

```
#include<stdio.h>
void main()
{
const float pi = 3.14; /* dec */
pi =20; /* init */
printf("pi = %f", pi);
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

1894 x 763px 100% 9:58 AM 08-Oct-24



TC

File Edit Run Compile Project Options Debug Bre

Error: Cannot modify a const object in function main

```
#include<stdio.h>
void main()
{
const float pi = 3.14; /* dec */
pi = 22/7; /* init */
printf("pi = %f", pi);
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 11 of 11 Words: 29 ↻ 90% 🔍 10:00 AM 08-Oct-24

The screenshot shows a Windows desktop environment. In the center is a window titled "TC" for Turbo C++. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break". A red error message at the top of the editor window reads "Error: Cannot modify a const object in function main". Below the message is the C code:

```
#include<stdio.h>
void main()
{
const float pi; /* dec */
pi = 3.14; /* init */
printf("pi = %f", pi);
}
```

At the bottom of the editor window, there is a toolbar with various icons and a status bar displaying "F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me".

The taskbar at the bottom of the screen shows several pinned icons, including File Explorer, FileZilla, DEV, Zoom, Google Chrome, Microsoft Word, Microsoft Paint, Microsoft Edge, and File Manager. The system tray shows the date and time as "08-Oct-24" and "10:02 AM".

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 Character / format specifier	Storage Range
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 $3.4 \times 10^{+38}$
double	8	%lf	1.7×10^{-308} to $1.7 \times 10^{+308}$
long double	10	%Lf	3.4×10^{-4932} to $1.1 \times 10^{+4932}$
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**

4 type of number formats:

1. Binary - %d
2. Decimal - %d
3. Octal - %o
4. Hexadecimal - %x

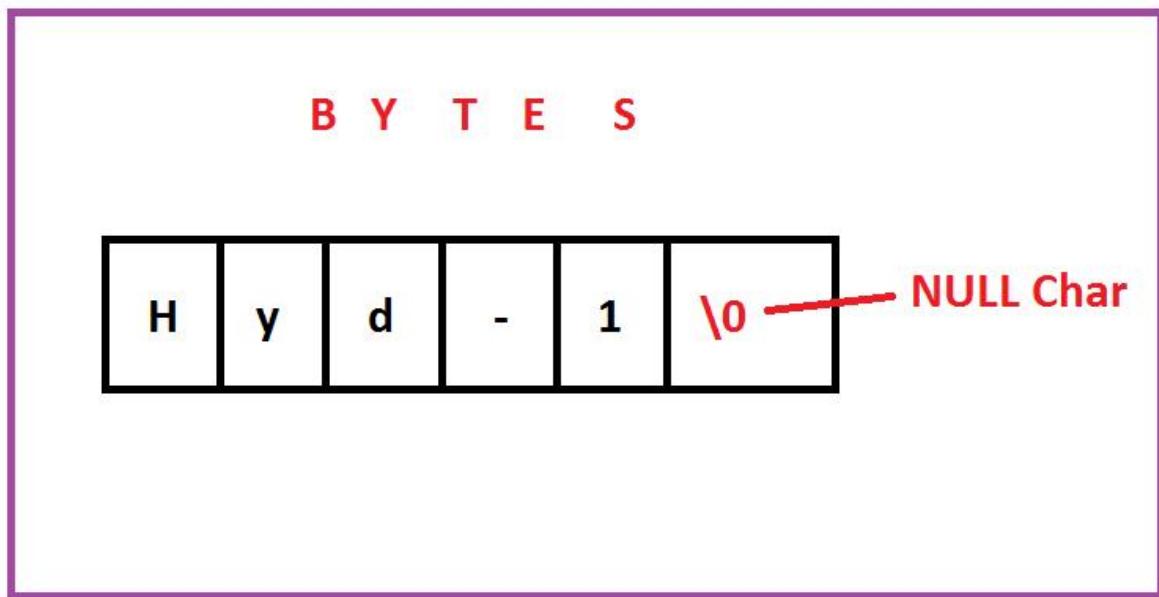
Strings:

1. A group of characters is called string.
2. It is alpha-numeric. i.e. in a string we can store both alphabets, numbers and special characters.

Eg: char city[6] = "Hyd-1";

MEMORY ALLOCATION FOR STRING:

R A M



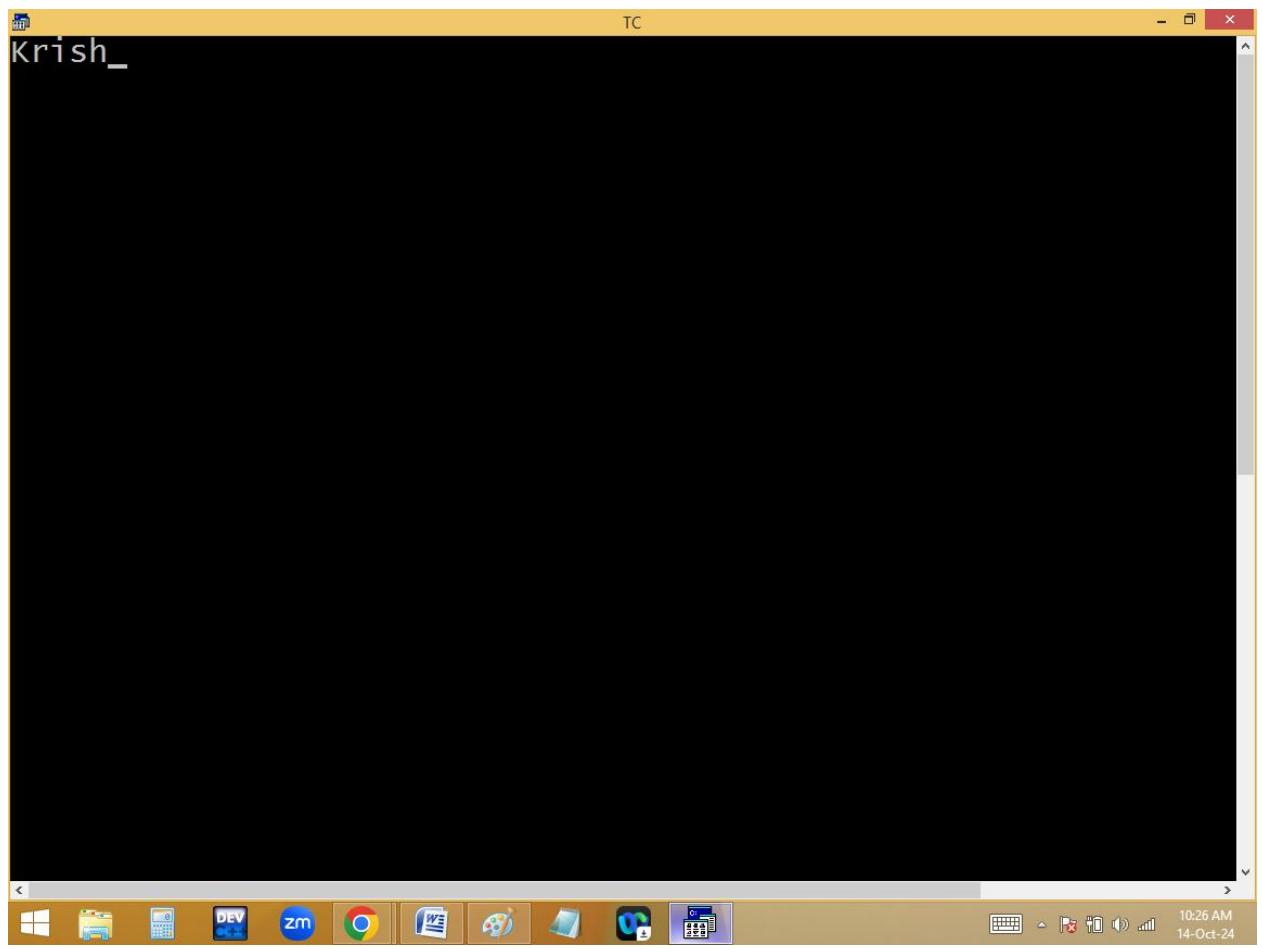
Note:

1. One byte should be left for NULL Char[\0]. Otherwise we are getting garbage values / Junk values.

A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C). The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom shows "Line 2 Col 18 Insert Indent Tab Fill Unindent E:9AM". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char name[6] = "Krish";
    clrscr();
    printf("%s", name);
    getch();
}
```

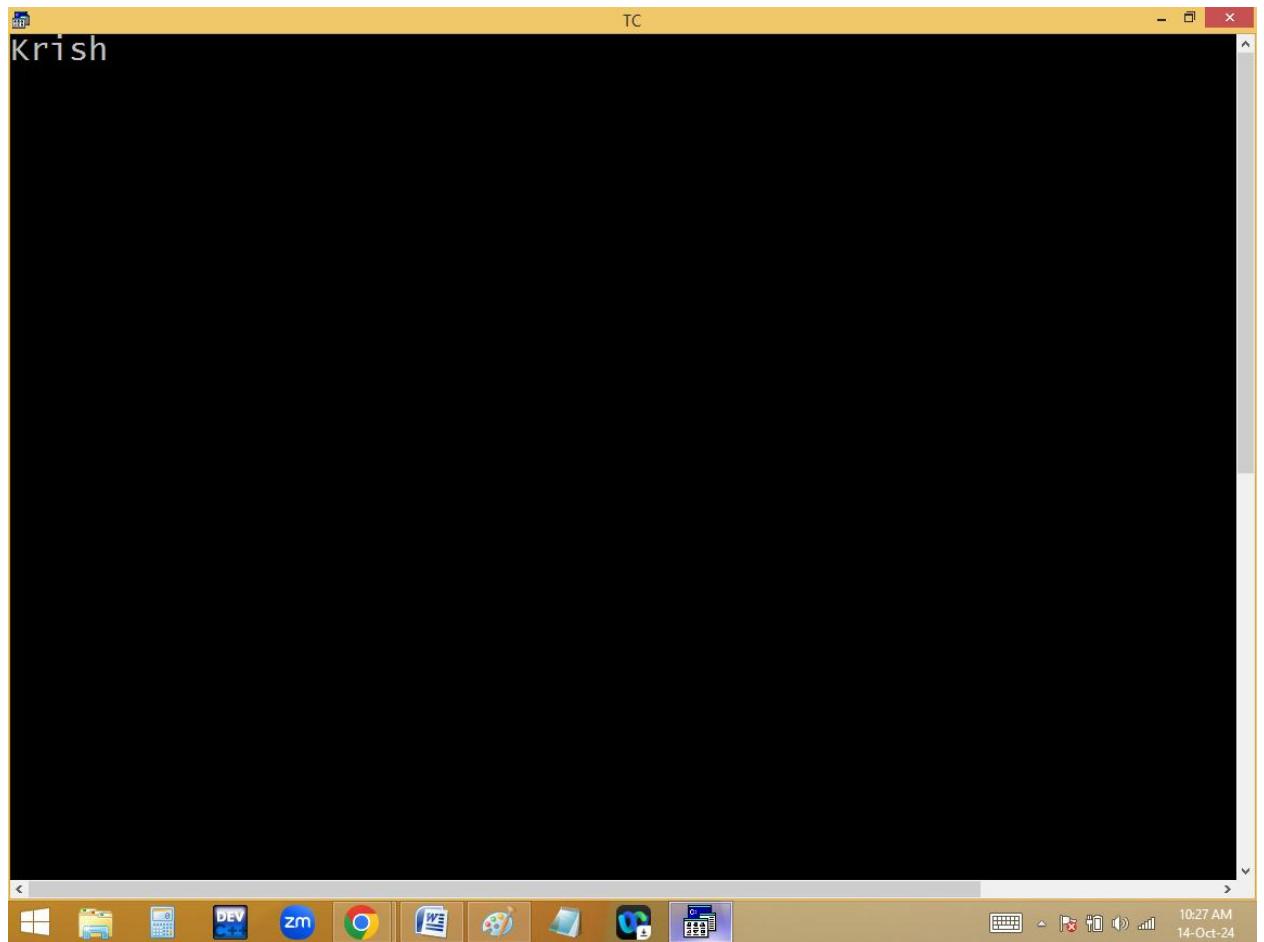
The taskbar at the bottom of the screen displays several pinned icons: Start, File Explorer, Task View, DEV, Zoom, Google Chrome, Microsoft Edge, Paint, File Explorer, and File Explorer. The system tray shows the date and time as 10:26 AM on 14-Oct-24.



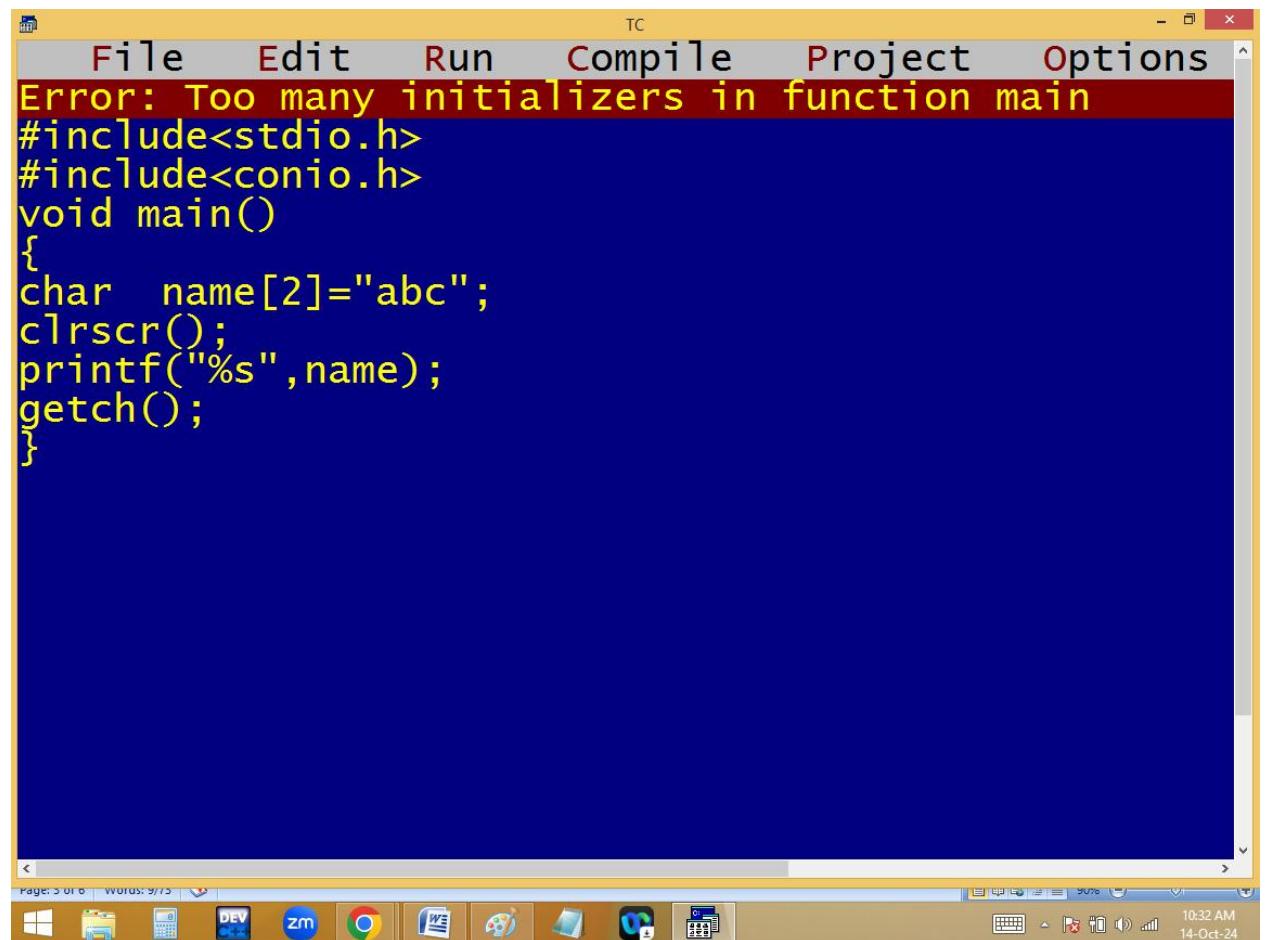
A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C). The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom of the window shows "Line 5 Col 12 Insert Indent Tab Fill Unindent * E:9AM". The code in the editor is:

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

Below the code editor is a toolbar with various icons. The taskbar at the bottom of the screen displays several pinned application icons, including File Explorer, Task View, Control Panel, DEV, Zoom, Google Chrome, Microsoft Edge, Paint, File Manager, and File Explorer again. The system tray shows the date and time as "10:27 AM 14-Oct-24".



2. String variable size never smaller than string. Otherwise we are getting error.



A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and TC. A red error message box is displayed, stating "Error: Too many initializers in function main". Below the menu, the code is shown:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char name[2]="abc";
    clrscr();
    printf("%s",name);
    getch();
}
```

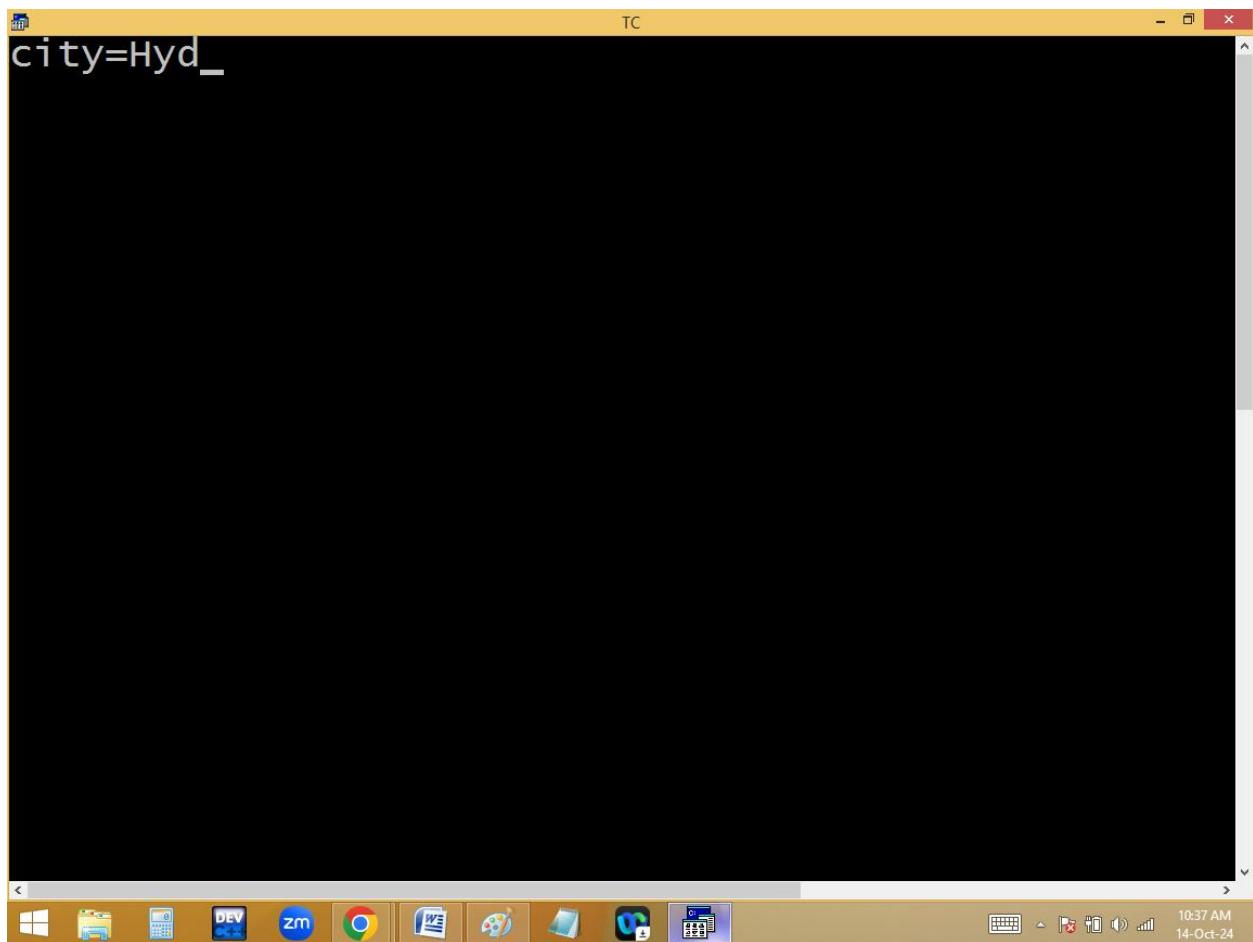
The status bar at the bottom shows "Page: 3 Of 6 WORDS: 9/75" and the system tray indicates it's 10:32 AM on 14-Oct-24.

3. We can't copy a string into a string variable using = [assignment] operator. We have to use strcpy() for this.

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, and TC. Below the menu, status text indicates Line 3, Col 17, Insert mode, Indent Tab, Fill, and Undo. The code area contains the following C program:

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

The taskbar at the bottom shows various pinned icons, including DEV, zm, Google Chrome, and Paint. The system tray displays the date and time as 10:37 AM, 14-Oct-24.

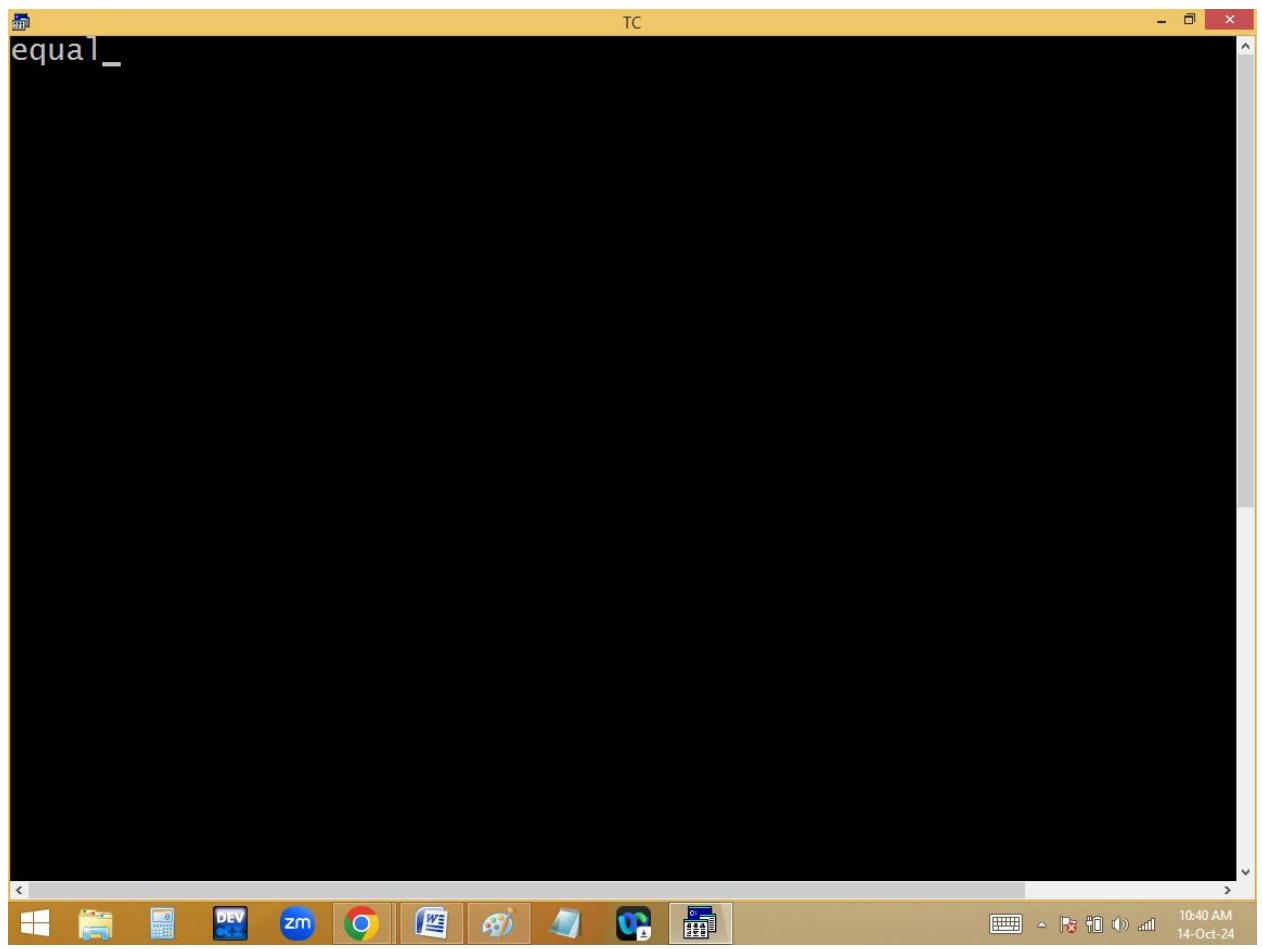


4. We can't compare two strings with comparison operator [==]. We have to use strcmp().

A screenshot of a Windows operating system desktop. In the foreground, a code editor window titled "TC" is open. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/, Line 8, Col 23, Insert, Indent, Tab Fill, Unindent, and *. The status bar at the bottom shows E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char city[20];
clrscr();
if(strcmp("a","a")==0)printf("equal");else printf("Not equal");
getch();
}
```

The keyboard status bar at the bottom of the window shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Menu. Below the window, the taskbar displays various pinned icons for Windows, File Explorer, Task View, DEV, Zoom, Google Chrome, Microsoft Edge, Paint, File Explorer, and File Explorer. The system tray shows the date and time as 10:40 AM, 14-Oct-24.



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;

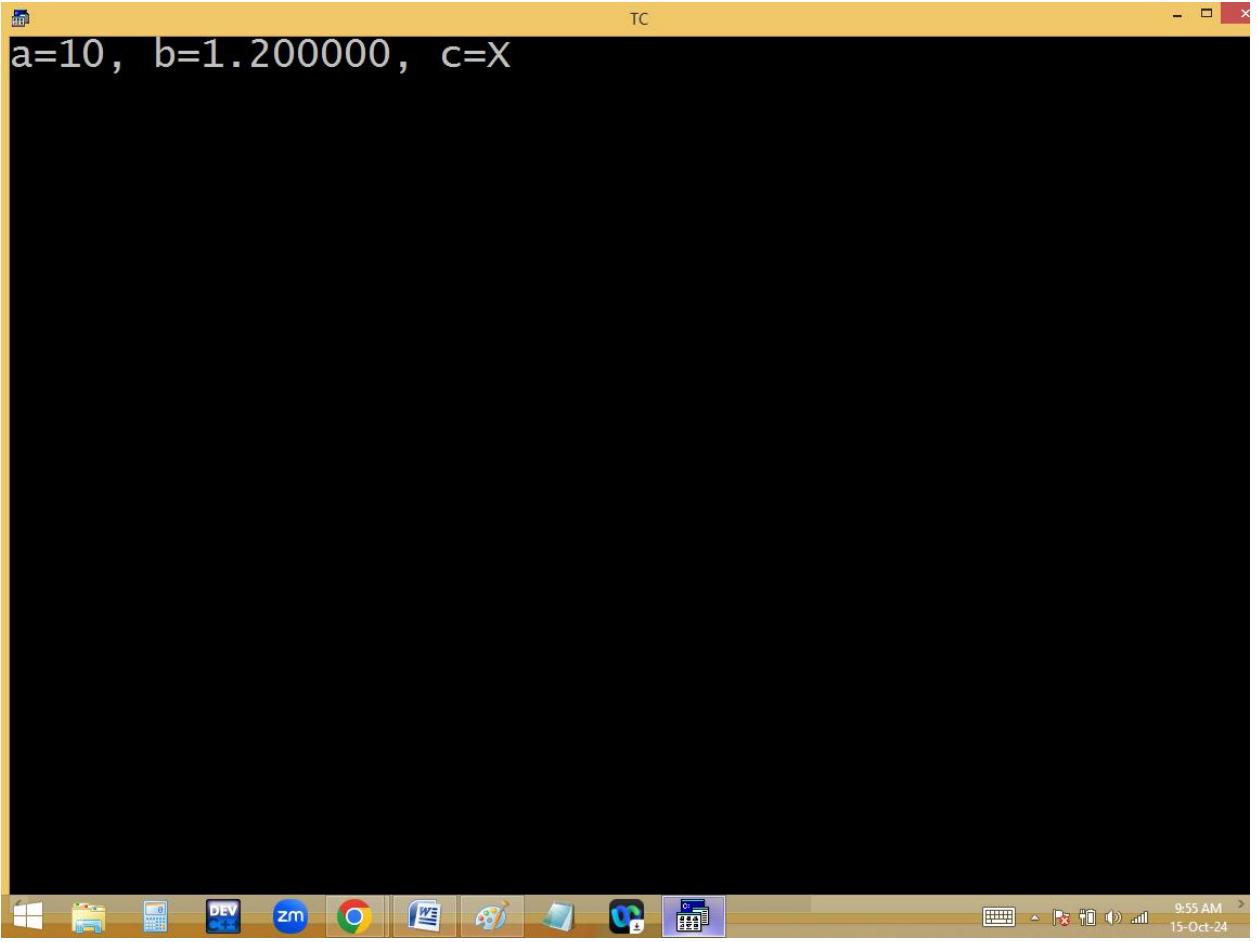
TC

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();
}
```



9:55 AM 15-Oct-24



TC

File Edit Run Compile Project Options

Error: Lvalue required in function main

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



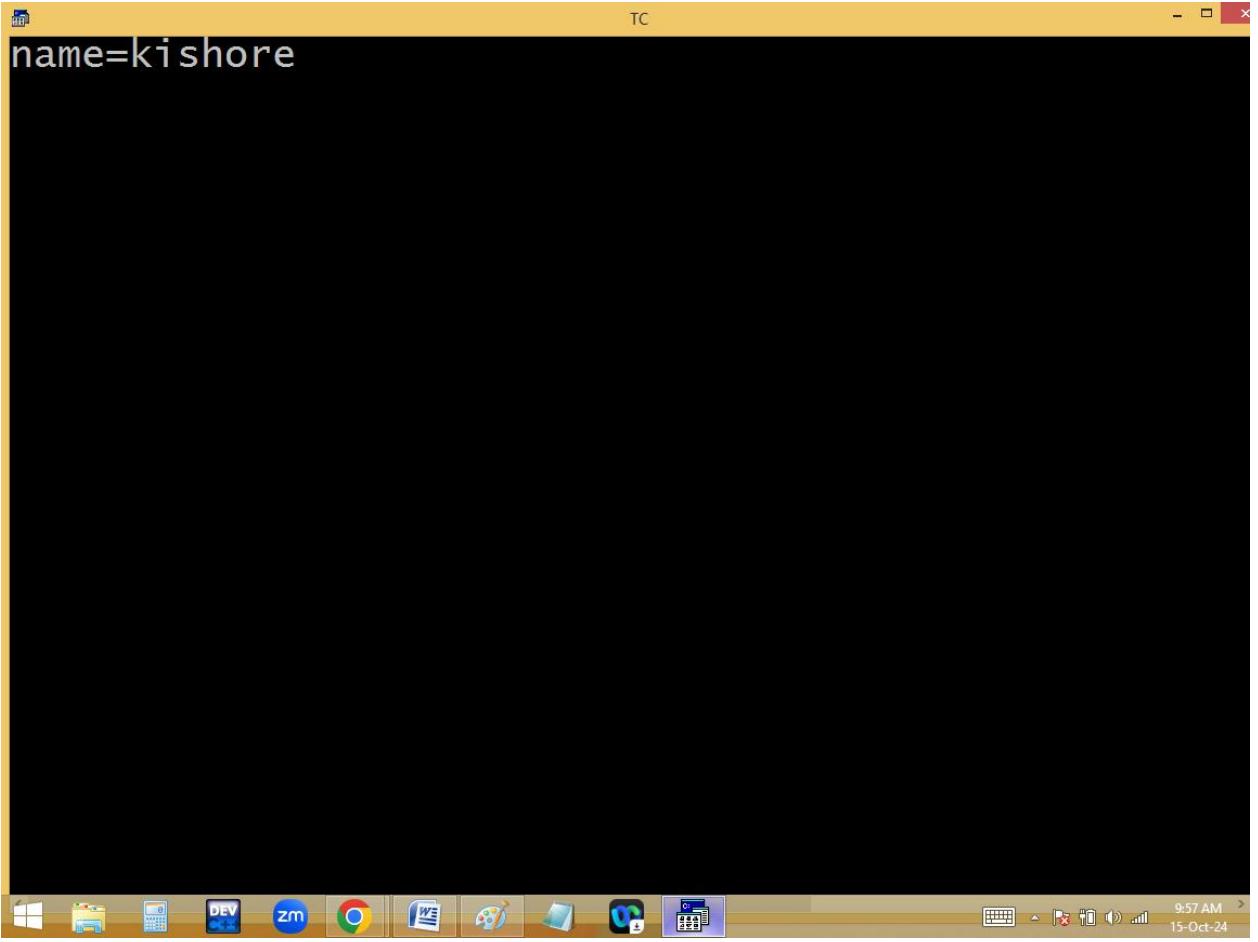
9:56 AM 15-Oct-24

A screenshot of a Windows desktop environment. In the center is a Notepad window titled "TC" with the following C code:

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

The Notepad window has a menu bar with options: File, Edit, Run, Compile, Project, Options, Line 9, Col 21, Insert, Indent, Tab, Fill, Unin. The status bar at the bottom shows "TC", "Line 9", "Col 21", and "Insert".

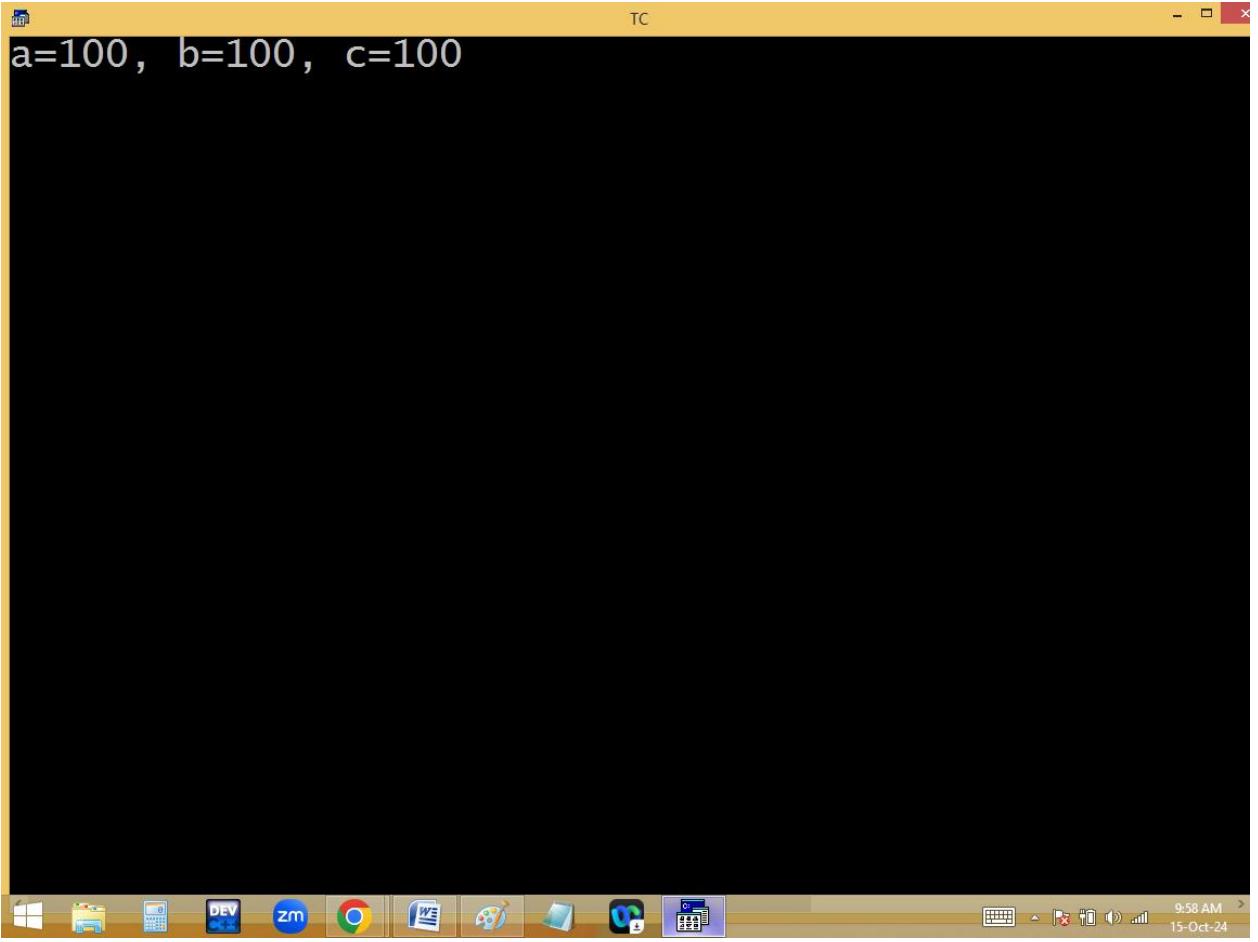
Below the Notepad window is a taskbar with several icons: Start, File Explorer, Task View, DEV, ZM, Google Chrome, FileZilla, Paint, Snipping Tool, Task Manager, and File Explorer. The system tray shows the date and time as "9:57 AM 15-Oct-24".



A screenshot of a Windows desktop environment. In the center is a window titled "TC" which is a code editor for the Turbo C++ compiler. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Line 8", "Col 32", "Insert", "Indent", "Tab", "Fill", and "Unin". The main code area contains the following C program:

```
#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();
}
```

The taskbar at the bottom shows various pinned icons, including a file explorer, a browser, and several application icons. The system tray shows the date and time as "9:58 AM 15-Oct-24".



File Edit Run Compile Project Options

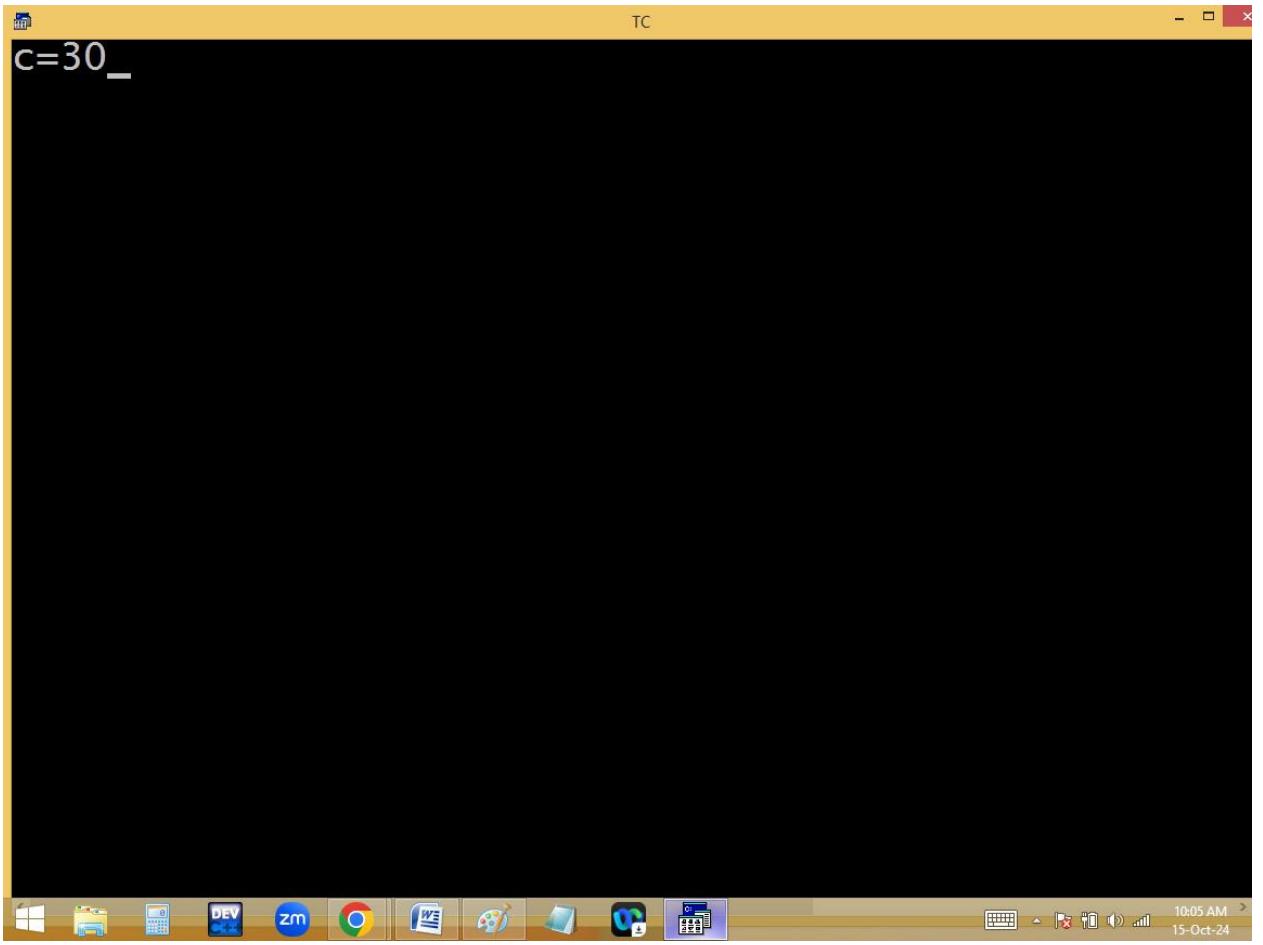
Error: Lvalue required in function main

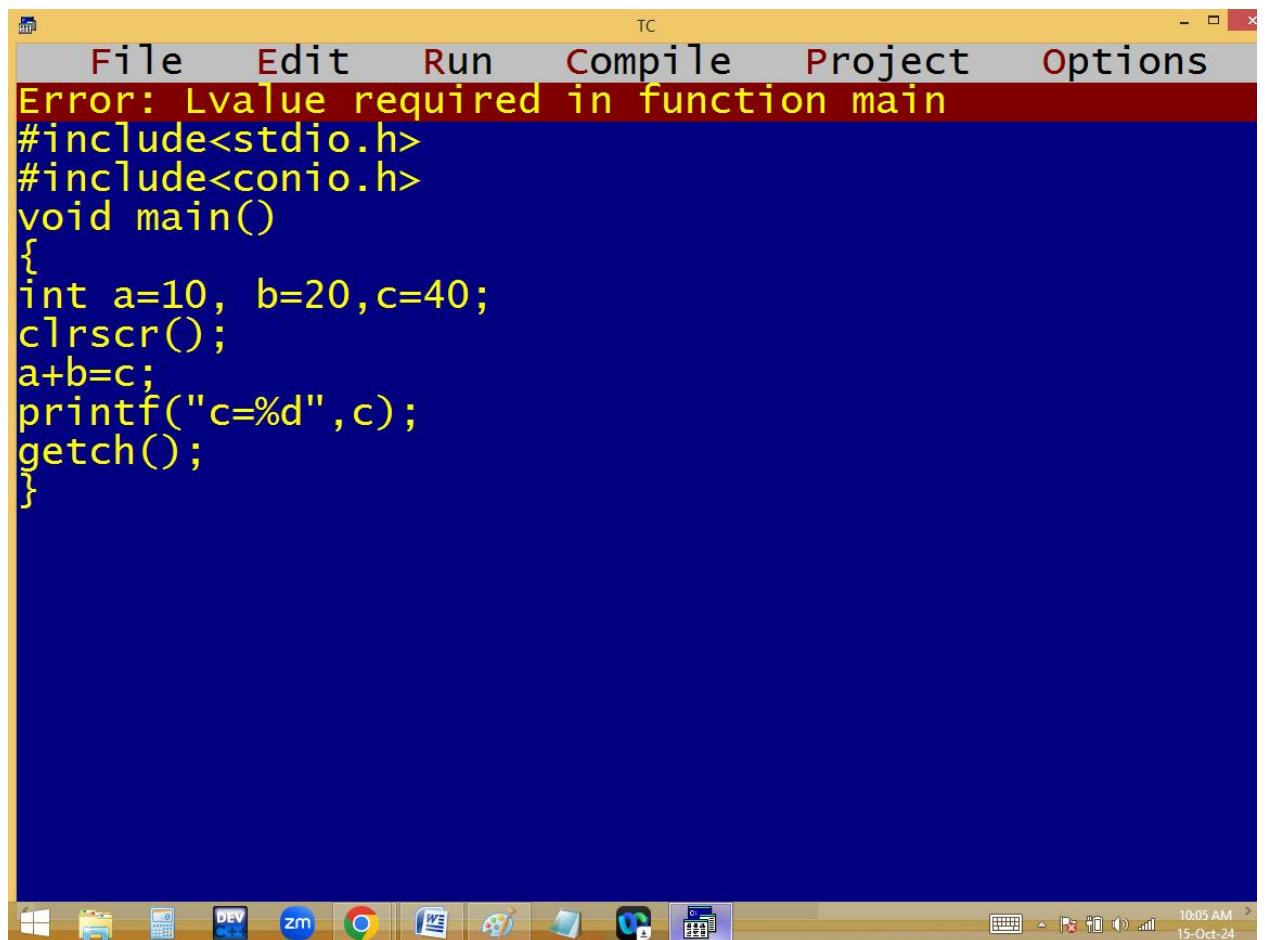
```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
10=20;
getch();
}
```

A screenshot of a Windows desktop environment. In the center is a Notepad window titled "TC" with 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 Notepad window has a menu bar with File, Edit, Run, Compile, Project, Options, Line 8, Col 18, Insert, Indent, Tab, Fill, Unin, and TC. The status bar at the bottom shows the current line (Line 8), column (Col 18), and mode (Insert). The desktop background is blue, and the taskbar at the bottom shows various pinned icons including File Explorer, Task View, Control Panel, ZM, Google Chrome, FileZilla, Paint, and File Manager. The system tray shows the date and time as 10:04 AM on 15-Oct-24.





The screenshot shows a window titled "TC" for the Turbo C++ compiler. The menu bar includes "File", "Edit", "Run", "Compile", "Project", and "Options". A red error message "Error: Lvalue required in function main" is displayed at the top. Below it is the 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();
}
```

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

They are used to perform mathematical calculations.

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

% - modules [Remainder]:

$$5 \% 2 = 1$$

$$2) 5 \left(2 \text{ <= Quotient} \right) /$$
$$\underline{4}$$

∴ Remainder ==> 1

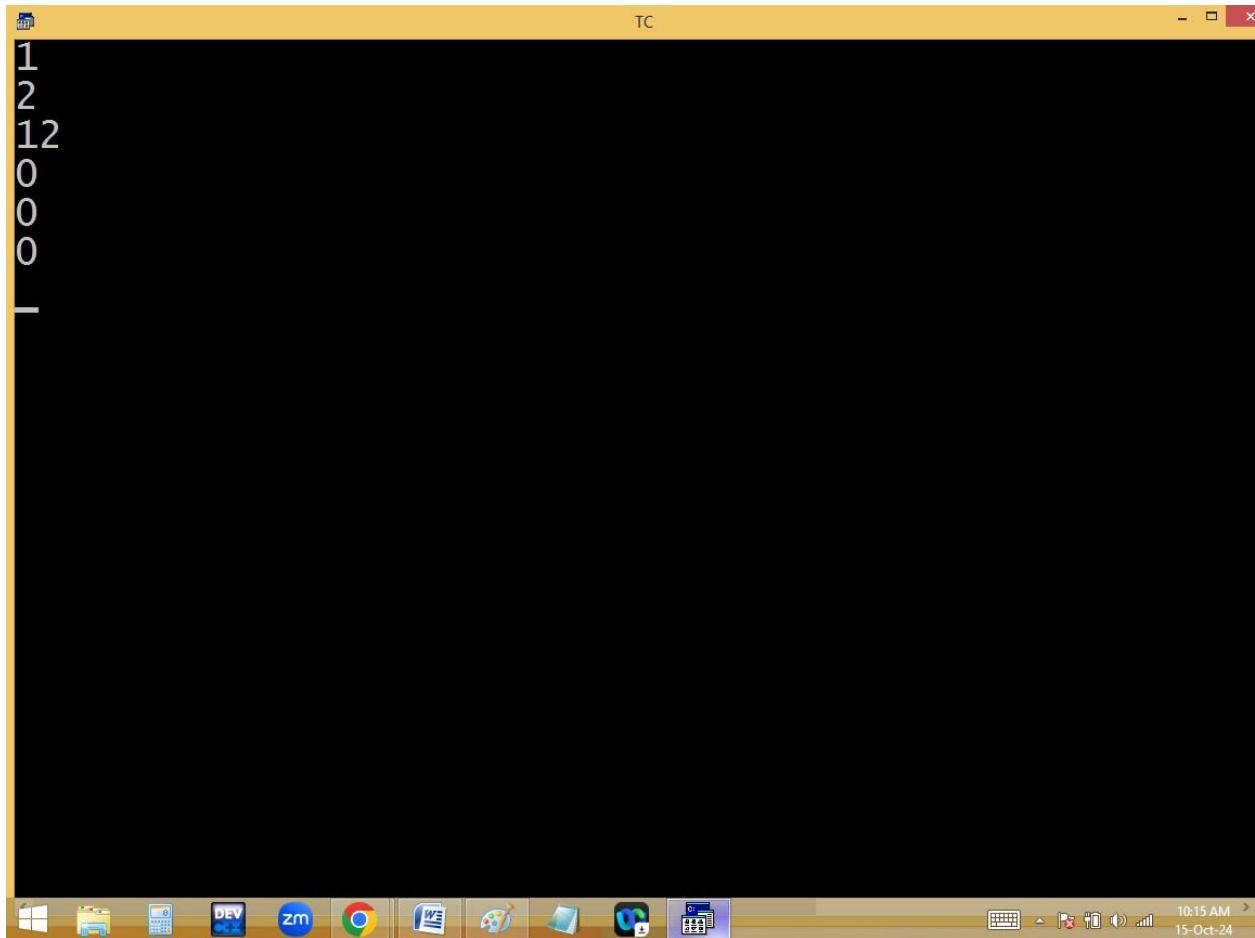
$$2 \% 5 = 2$$

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

A screenshot of a Windows desktop environment. In the center is a window titled "TC" containing a C program. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Unin". The status bar at the bottom shows "Line 11 Col 19 Insert Indent Tab Fill Unin". The code itself 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 desktop taskbar at the bottom has icons for various applications like File Explorer, Task View, and Control Panel. The system tray shows the date and time as "15-Oct-24" and "10:15 AM".



The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. In the center is a terminal window titled "TC". The terminal has a black background and displays the text "12%0" on the left side. On the right side of the terminal, there is a vertical white bar. The system tray at the bottom right shows the date and time as "10:15 AM 15-Oct-24".

$5.0 \% 2.0 = \text{Error}$

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

A screenshot of a Windows desktop environment. At the top is the taskbar with various icons. Below it is a window titled "TC" (Turbo C++) with a menu bar containing File, Edit, Run, Compile, Project, and Options. The main area of the window displays a C program and its error message. The code is:

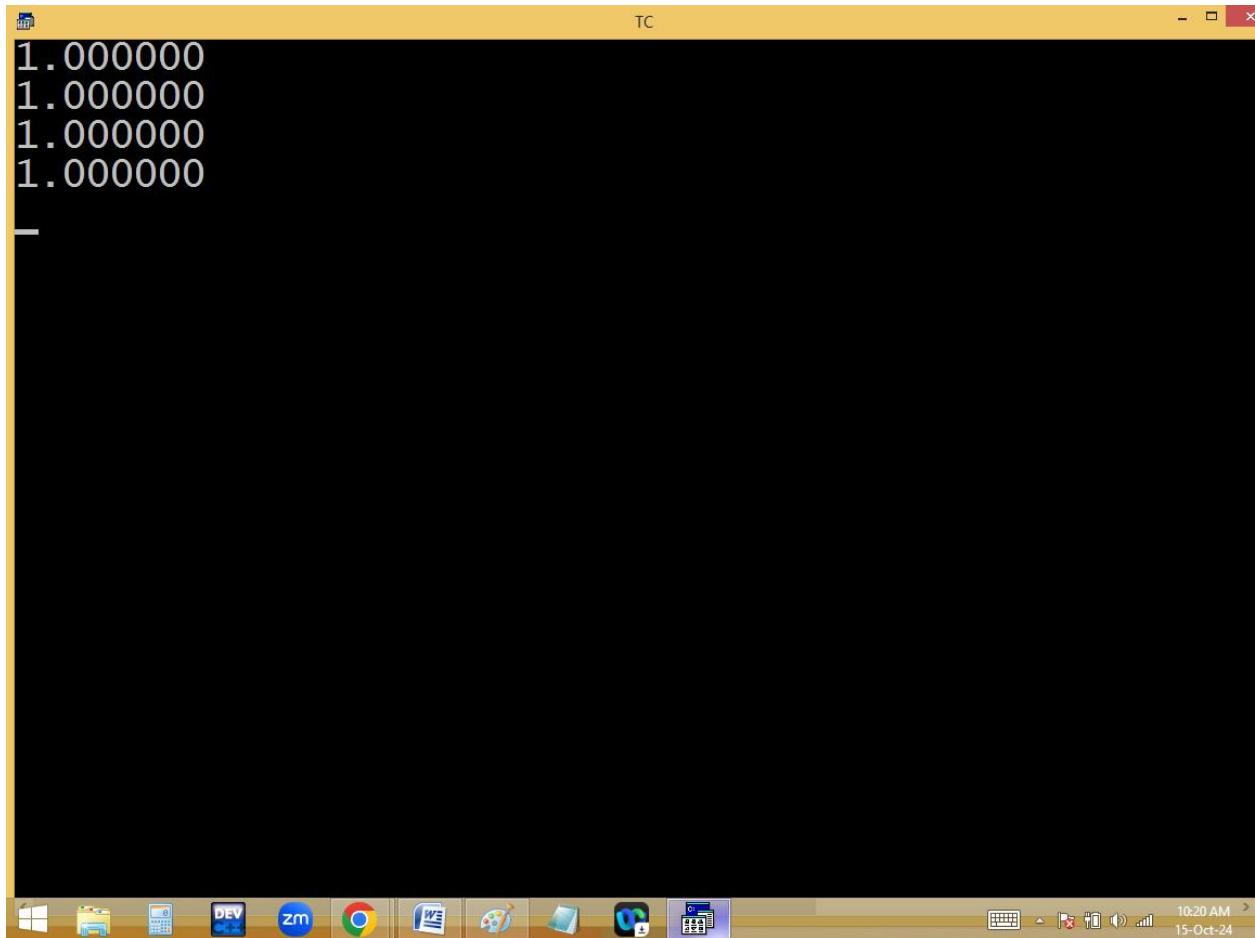
```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%f",5.0%2.0);
getch();
}
```

The error message "Error: Illegal use of floating point in function mai" is displayed in red at the top of the code area. The system tray shows the date and time as 15-Oct-24 10:18 AM.

A screenshot of a Windows desktop environment. In the center is a window titled "TC" (Turbo C++) with a menu bar containing File, Edit, Run, Compile, Project, Options, Line 10, Col 23, Insert, Indent, Tab, Fill, Unin. The main code area contains the following C code:

```
#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();
}
```

The status bar at the bottom shows system icons and the date/time: 10:20 AM, 15-Oct-24.



```
1.000000
1.000000
1.000000
1.000000
-
```

$$281 \% 10 = 1$$

$$94 \% 10 = 4$$

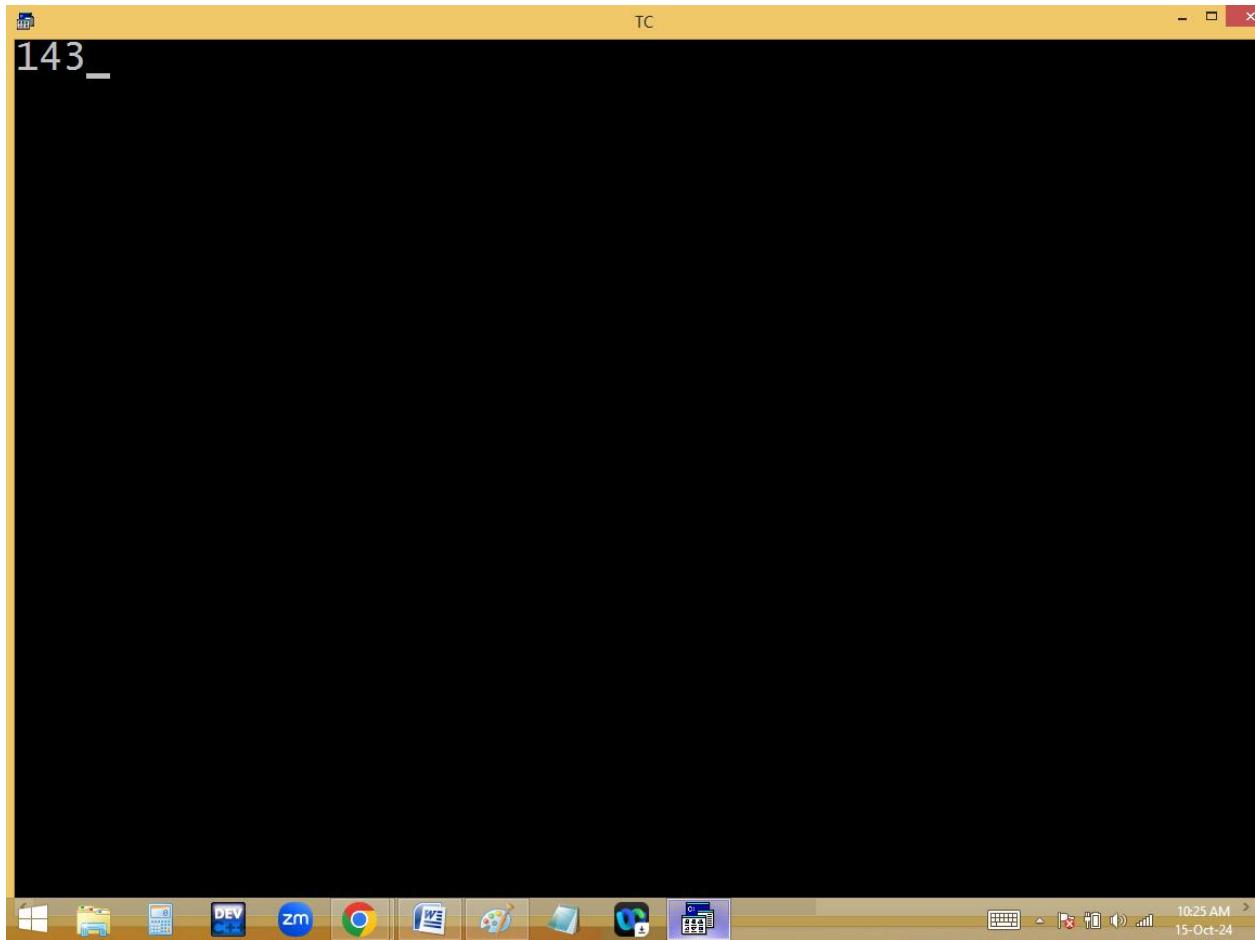
$$3 \% 10 = 3$$

Note: Any no%10 gives last digit.

A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C). The menu bar includes File, Edit, Run, Compile, Project, Options, Line 3, Col 1, Insert, Indent, Tab, Fill, and Unin. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("%d%d%d", 281%10, 94%10, 3%10);
    getch();
}
```

The status bar at the bottom shows the date and time as 10:25 AM, 15-Oct-24. The taskbar at the bottom has several pinned icons: File Explorer, Task View, Calculator, DEV, ZM, Google Chrome, Microsoft Edge, Paint, OneNote, and File Explorer again. The desktop background is a solid blue.



$$5\%-2= 1$$

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

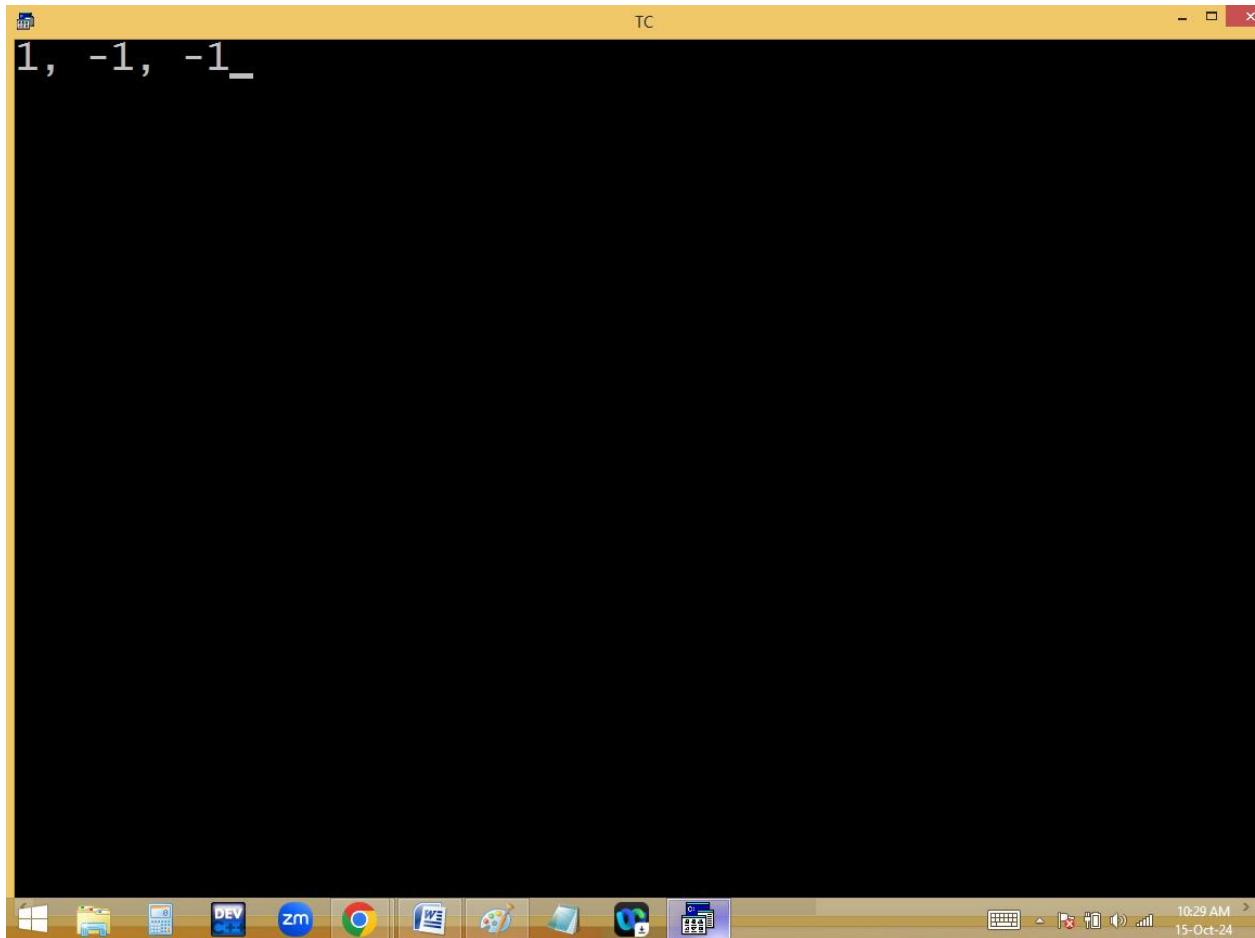
$$-5\%2= -1$$

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

A screenshot of a Windows desktop environment. In the center is a window titled "TC" (Turbo C++) with a dark blue background. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and status indicators for "Line 6" and "Col 37". The code area contains the following C program:

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

The taskbar at the bottom shows various pinned icons, including File Explorer, Task View, and several application icons. The system tray shows the date and time as "15-Oct-24" and "10:28 AM".



/ - division [Quotient]:

$$5/2=2 \text{ [int/int=int]}$$

$$5.0/2=2.500000$$

$$5/2.0=2.500000$$

$$5.0/2.0=2.500000$$

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

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Line 17, Col 1, Insert, Indent, Tab, Fill, and Undo. The code editor displays the following C program:

```
#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();
}
```

The taskbar at the bottom shows various application icons, including DEV, zm, Google Chrome, and Paint. The system tray indicates the date as 15-Oct-24 and the time as 10:44 AM.

```
2
2.500000
2.500000
2.500000
2.500000
2
2.000000
5
12.000000
```


$$123/10=12$$

$$12/10=1$$

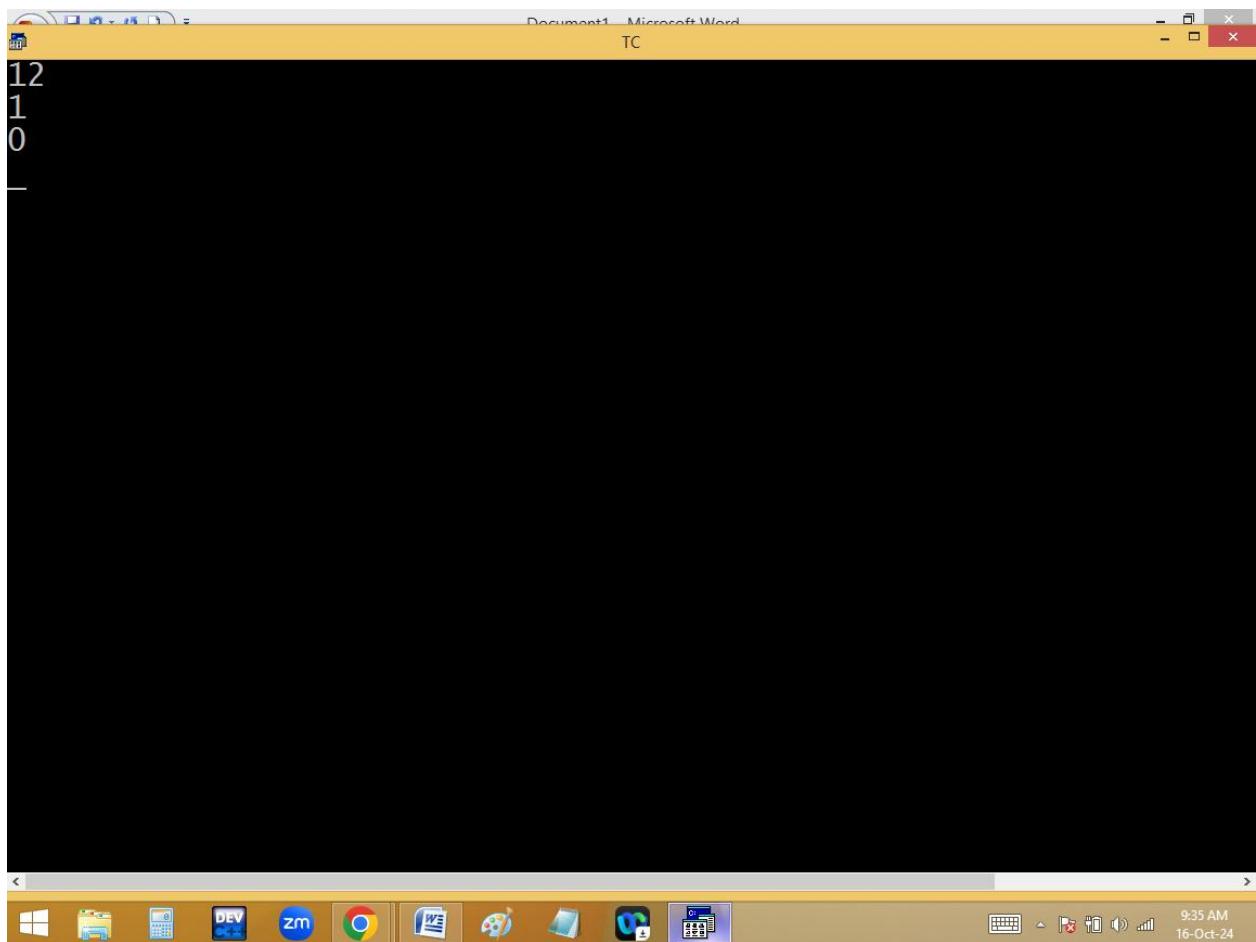
$$1/10=0$$

Note: Any no/10 removes the last digit.

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the top right shows "Line 9 Col 1 Insert Indent Tab Fill Unindent * E:9AM". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n",123/10);
printf("%d\n",12/10);
printf("%d\n",1/10);
getch();
}
```

The status bar at the bottom shows function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. The taskbar at the bottom has icons for various applications, and the system tray shows the date and time as 9:35 AM, 16-Oct-24.



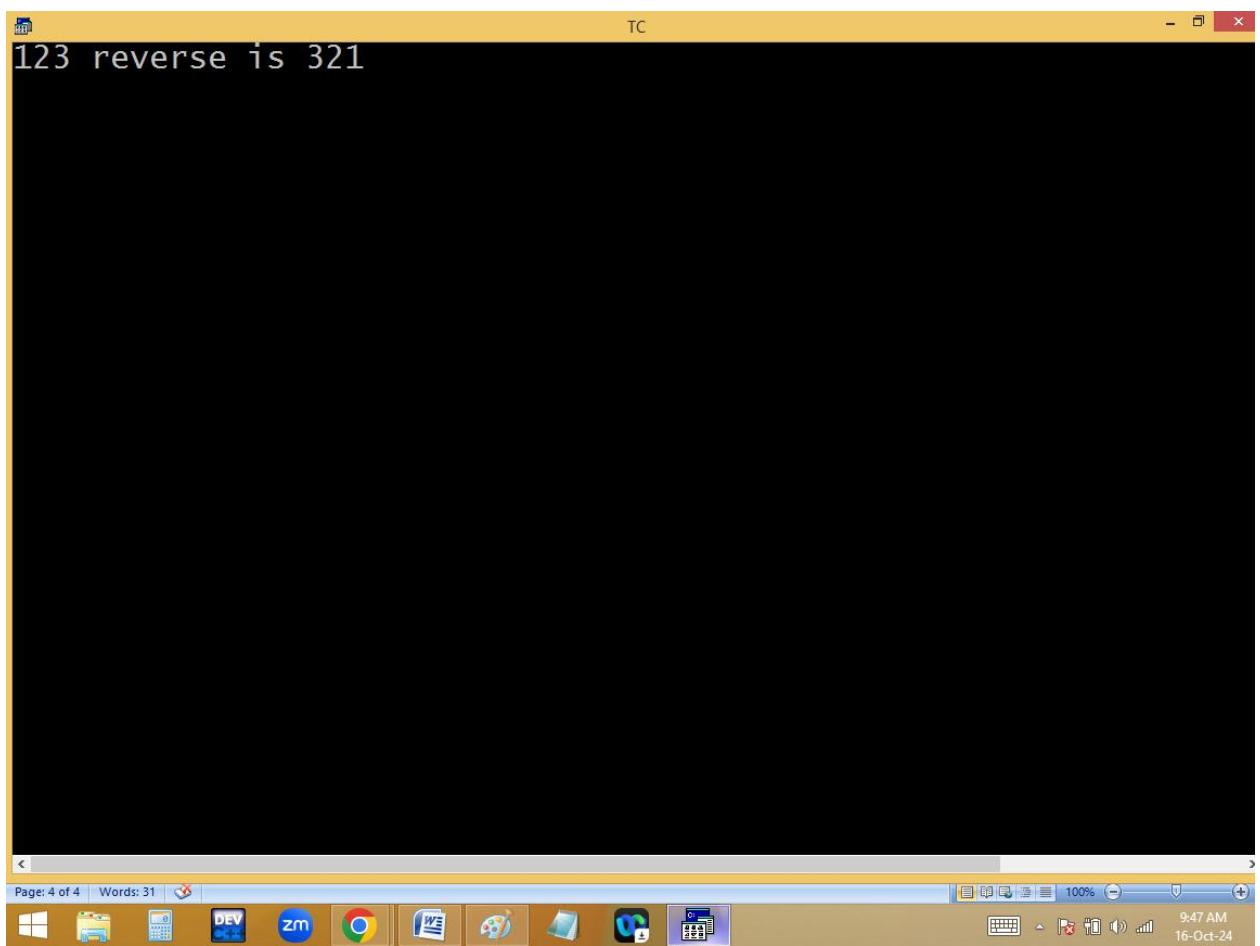
Write a c program to print a 3 digit no in reverse order without using loop.

Eg: 123 reverse is 321

A screenshot of a Microsoft Visual Studio Code window. The window title is "TC". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar shows "Line 9 Col 26 Insert Indent Tab Fill Unindent * E:9AM". The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n=123;
    clrscr();
    printf("%d reverse is %d",n,n%10); /* 123 reverse is 3 */
    n=n/10; /* last digit 3 deleted i.e. n value 12 */
    printf("%d%d",n%10,n/10);
    getch();
}
```

The status bar also displays keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me.



$$\begin{array}{r}
 10) 123 \left(12 \rightarrow \begin{array}{r} 10) 12(1 \\ \underline{10} \\ 2 \end{array} \right) \\
 \hline
 3
 \end{array}$$

$123 \% 10 = 3$
 $123 / 10 = 12$
 $12 \% 10 = 2$
 $12 / 10 = 1$

$$-5/2 = -2$$

$$5/-2 = -2$$

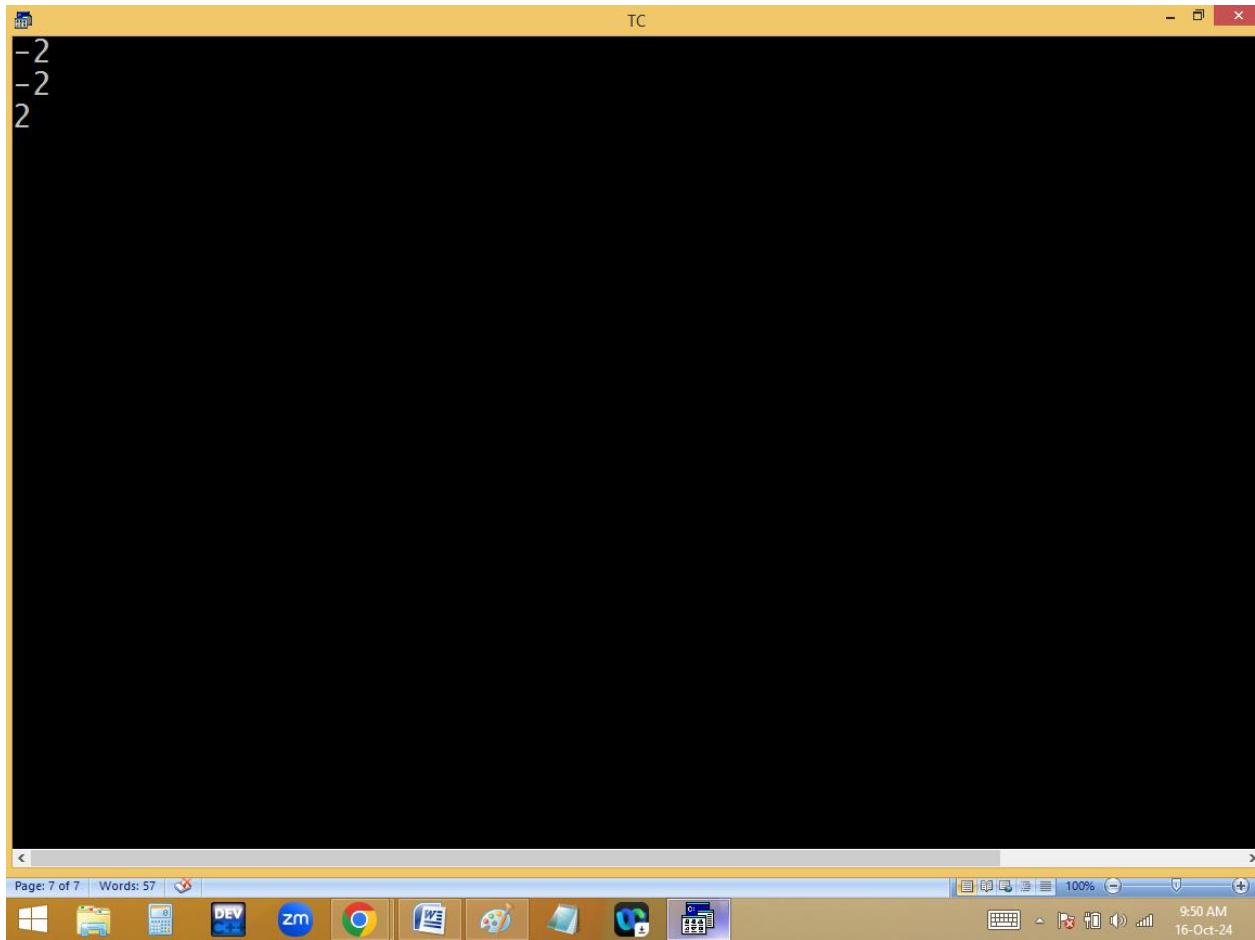
$$-5/-2 = 2$$

Note: In division any one operand is negative then result also negative. If both are negative then result is positive.

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom of the window shows "Line 6 Col 36 Insert Indent Tab Fill Unindent * E:9AM". The code area contains the following C program:

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

Below the window, the Windows taskbar displays several pinned icons: File Explorer, File History, Task View, Control Panel, File Cabinet, Paint, Snipping Tool, Task Scheduler, and File Explorer again. The system tray shows the date and time as "16-Oct-24" and "9:50 AM".



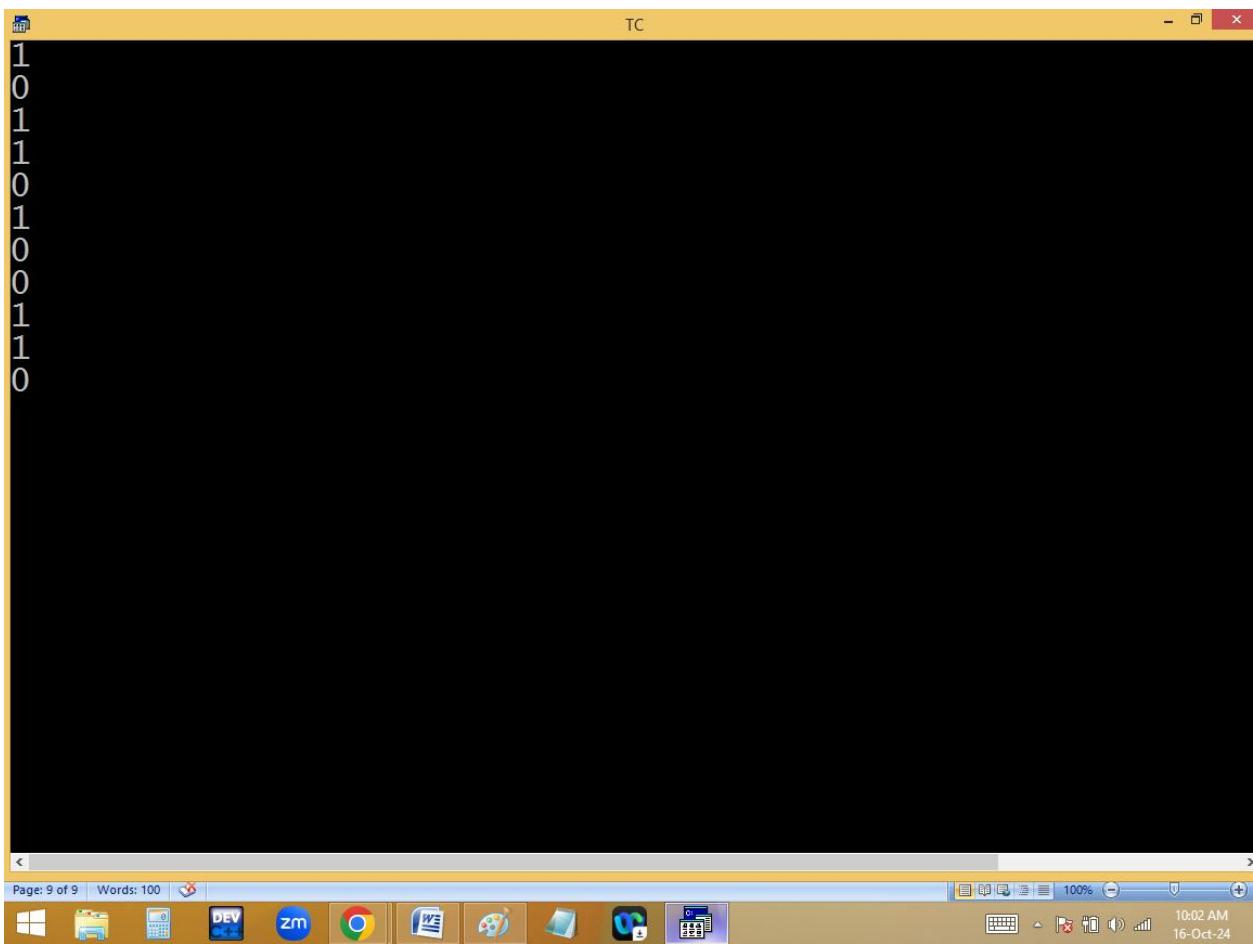
Relational operators [== (comparison), <, >, <=, >=, != (not equal)]:

They are used to compare two values or expressions. If the relation is true always it return 1. If the relation is false then it return 0.

The screenshot shows a window titled "TC" representing the Turbo C++ IDE. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the top right shows "Line 16 Col 23 Insert Indent Tab Fill Unindent * E:9AM". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 5==5);
printf("%d\n", 5==3);
printf("%d\n", 5==5.0);
printf("%d\n", .5==0.50);
printf("%d\n", 5.5==5.05);
printf("%d\n", 'a'=='a');
printf("%d\n", "a"=="a");
printf("%d\n", 'a'==65);
printf("%d\n", 'a'==97);
printf("%d\n", 'a'=='A'+32);
printf("%d\n", 'a'=="a");
getch();
}
```

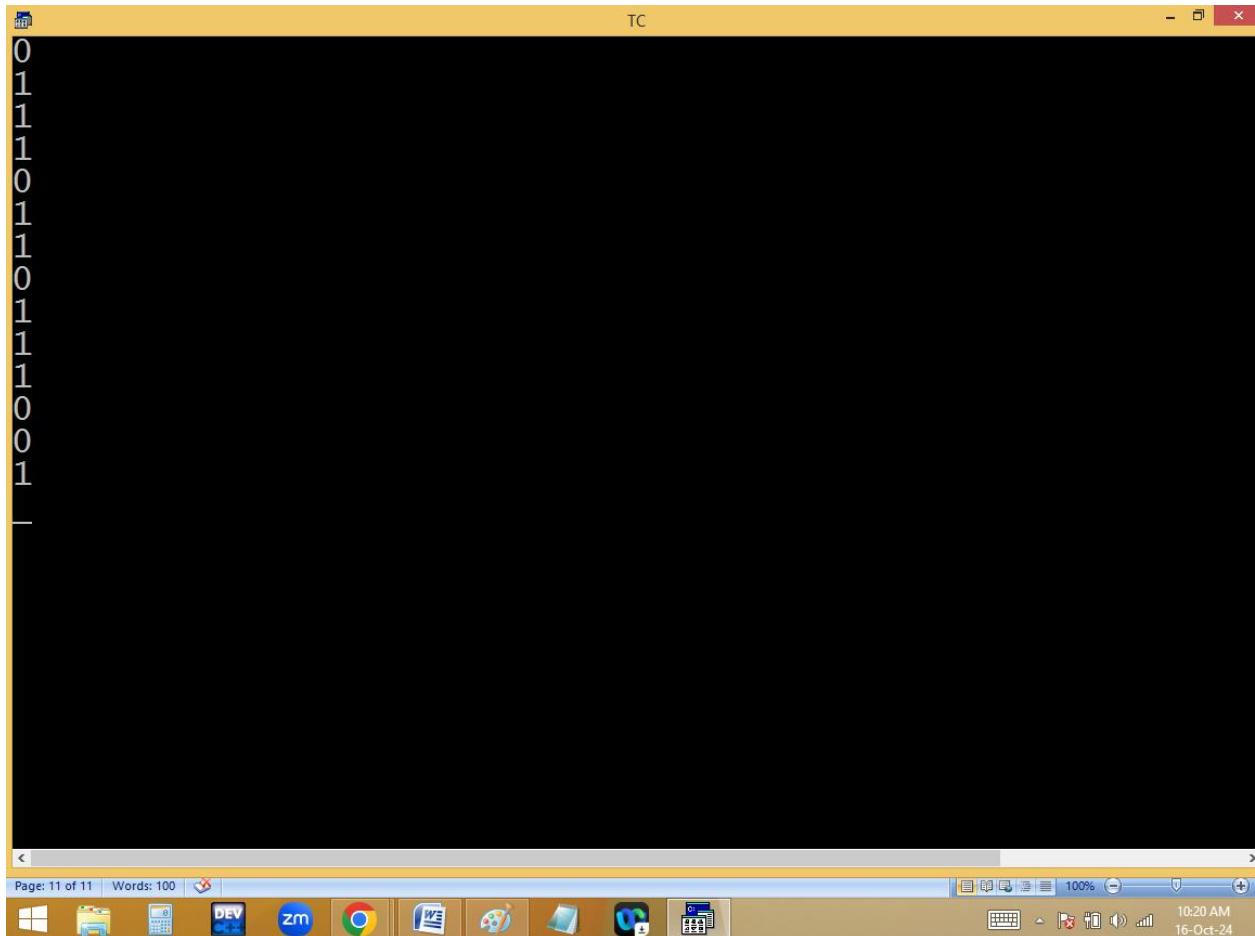
The status bar at the bottom shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. The taskbar at the bottom displays various application icons, and the system tray shows the date and time as 10:02 AM on 16-Oct-24.



A screenshot of a Microsoft Windows operating system desktop. In the foreground, a window for the Turbo C++ compiler is open. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break". A status bar at the bottom shows "Line 20 Col 1 Insert Indent Tab Fill Unindent * E:9AM". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 5>5);
printf("%d\n", 5<=5);
printf("%d\n", 5!=5.5);
printf("%d\n", 'a'>='B');
printf("%d\n", 5+3/2==4);
printf("%d\n", (5+3)/2==4);
printf("%d\n", 5-3+2==4);
printf("%d\n", 5-(3+2)==4);
printf("%d\n", 5*3/2==7);
printf("%d\n", 5%3/2==1);
printf("%d\n", 2+3*4+5==19);
printf("%d\n", 2+3*4+5==25);
printf("%d\n", 2+3*4+5==45);
printf("%d\n", (2+3)*(4+5)==45);
getch();
}
```

The keyboard shortcut bar below the menu bar lists F1-Help through F10-Me. The taskbar at the bottom shows various pinned icons, including File Explorer, Task View, Control Panel, and others. The system tray shows the date and time as 10:19 AM on 16-Oct-24.



Operator precedence / Operator priority

(ASSOCIATION OF OPERATORS)

1. ()
2. +, - , ! (sign operators, unary operators)
3. ++, -- (pre increment & decrement)
4. *, / , %

5. +, - (Binary)
6. ==, !=
7. &&
8. ||
9. ?: (ternary operator)
10. =
11. ++, -- (Post increment & decrement)
12. , (comma)

Logical operators:

- 1.&& - logical and
- 2.|| - logical or
- 3.! – logical not

Note: In C other than 0 anything is 1 i.e. true. 0 means false.

Truth tables:

Operator	Expression1	Expression2	Result
&&	1	1	1
	1	0	0
	0	1	0
	0	0	0
	1	1	1
	1	0	1
	0	1	1
	0	0	0

&& , || used to combine two or more expressions into a single expression.

! operator used for negation. i.e.

! true means false.

! false means true.

The screenshot shows a Microsoft Visual Studio IDE window. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. A red error message at the top states: "Error: Function call missing) in function main". The code editor contains the following C++ code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 5>5    7==7);
getch();
}
```

The status bar at the bottom displays keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. The taskbar at the bottom shows icons for various applications including Windows File Explorer, DEV, ZM, Google Chrome, FileZilla, Paint, Task Manager, and a file icon.

```
TC
File Edit Run Compile Project Options Debug Bre
Line 17 Col 57 Insert Indent Tab Fill Unindent * E:9AM
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 5>5 , 7==7);
printf("%d, %d\n", 5>5 , 7==7);
printf("%d\n", 5>5 && 7==7);
printf("%d\n", 5>5 || 7==7);
printf("%d\n", !(5>5));
printf("%d\n", !(5==5));
printf("%d\n", 2==2 && 3<=3 && 4!=4);
printf("%d\n", 2==2 || 3<=3 && 4!=4);
printf("%d\n", (2==2 || 3<=3) && 4!=4);
getch();
}
/* NOTE: && OPERATOR GOT MORE PRIORITY THAN || OPERATOR */

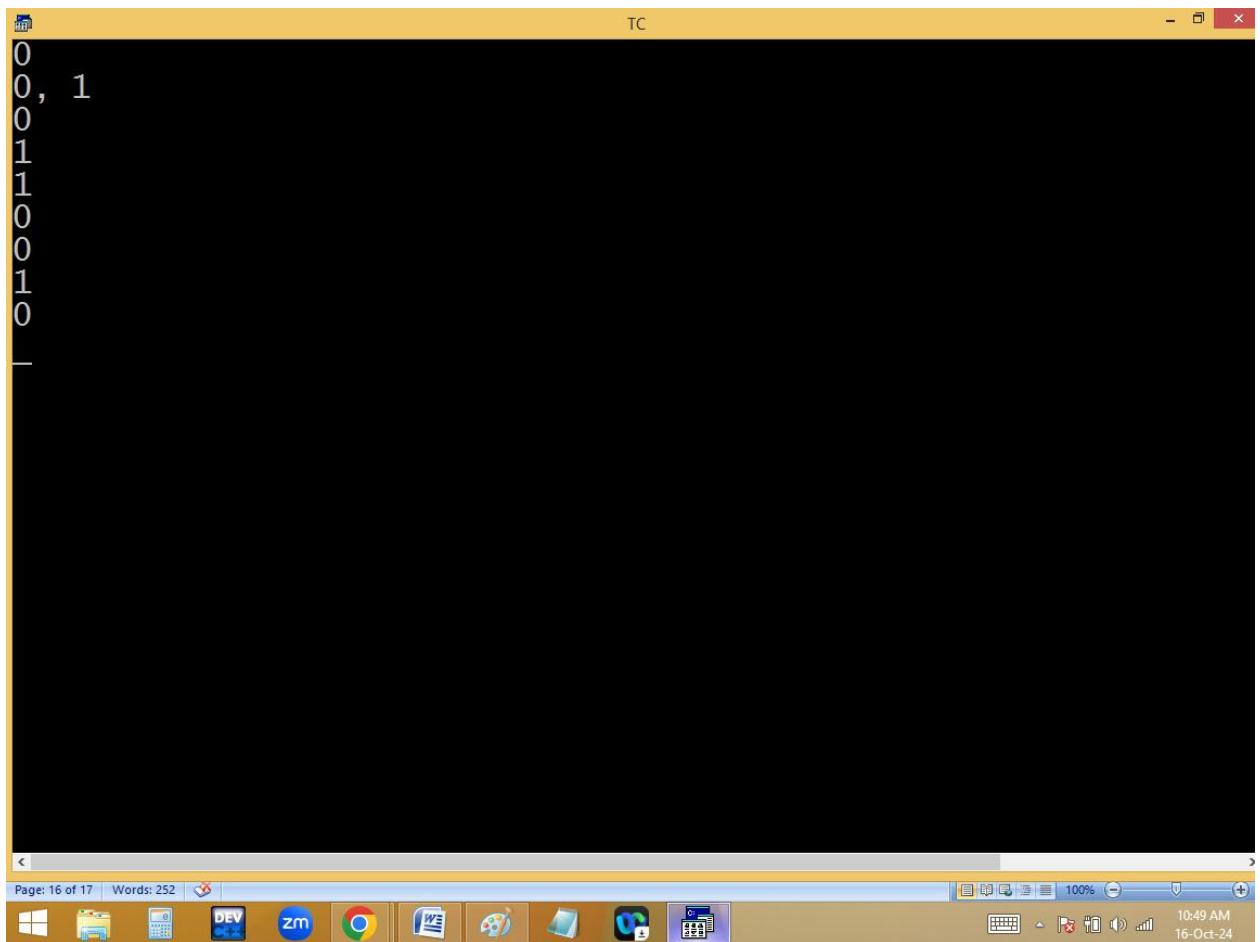
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-M

Page: 15 of 16 Words: 252



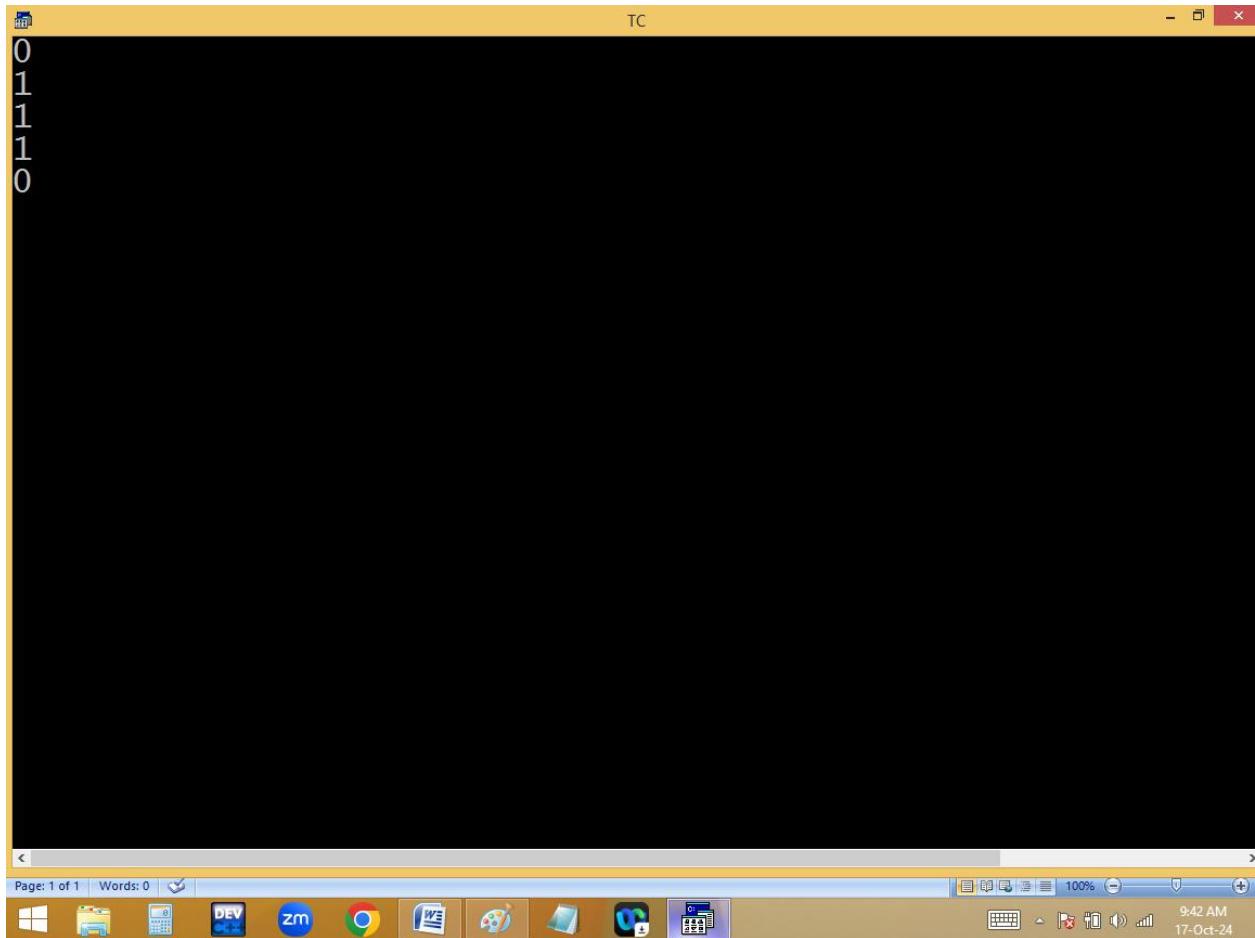
10:49 AM
16-Oct-24



A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break". Below the menu bar, status text indicates "Line 7 Col 20 Insert Indent Tab Fill Unindent * E:9AM". The main code editor area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 5>3>1);
printf("%d\n", 5>3>0);
printf("%d\n", 5 && -5);
printf("%d\n", 0 || 'a');
printf("%d\n", !0 && !1.1);
getch();
}
```

The keyboard status bar at the bottom shows function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. The taskbar at the bottom displays various pinned icons, including File Explorer, Task View, Control Panel, and others. The system tray shows the date and time as 9:42 AM on 17-Oct-24.



5 > 3 > 1

1 > 1

0

5 && -5

1

0 || 'a'

0 || 1

1

!0 && !1.1

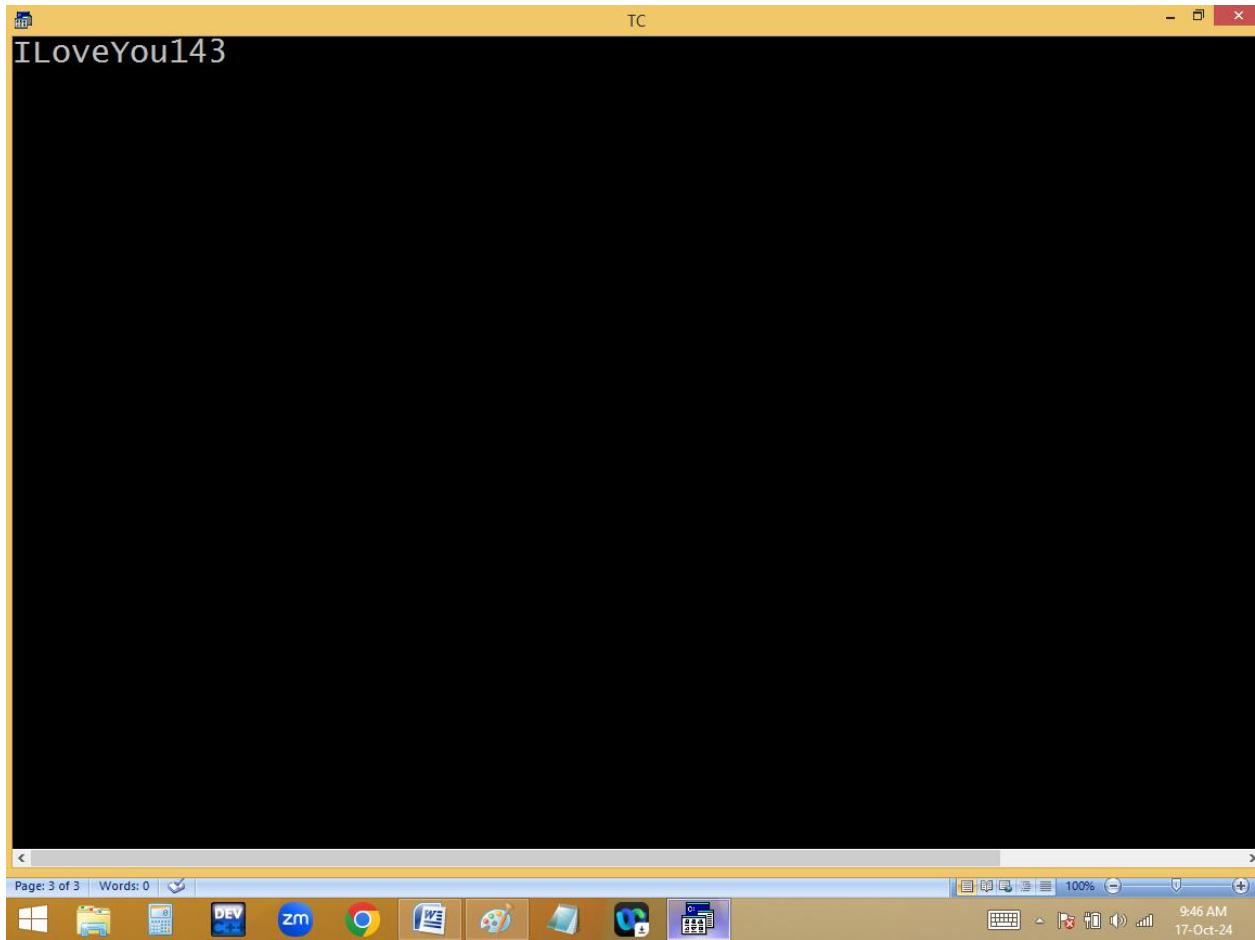
1 && 0

0

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom shows "Line 10 Col 5 TC E:9AM". The code editor contains the following C program:

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

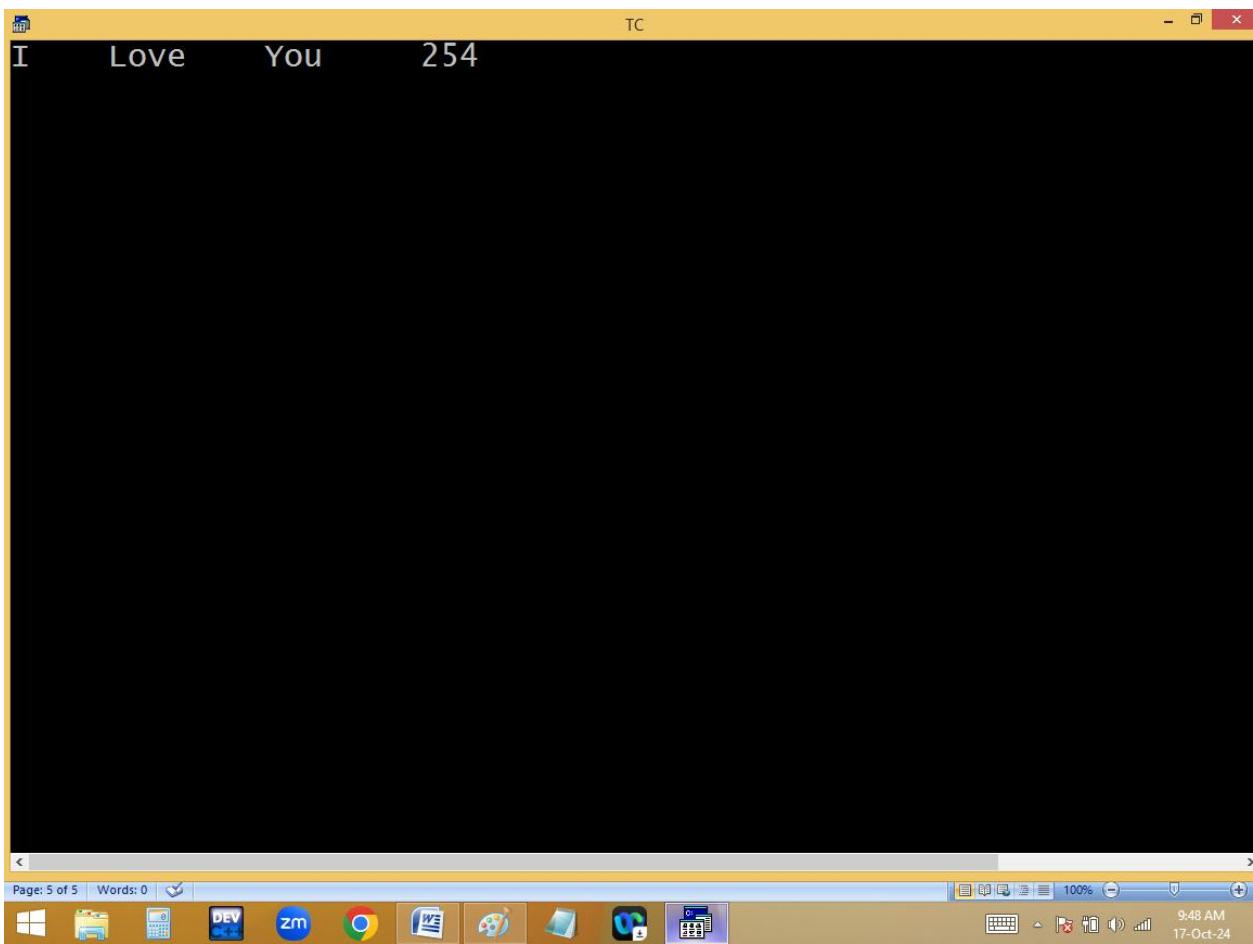
The taskbar at the bottom displays various application icons, including File Explorer, Edge browser, and other development tools. The system tray shows the date and time as 9:45 AM, 17-Oct-24.



A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom of the window shows "Line 9 Col 18 Insert Indent Tab Fill Unindent * E:9AM". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c;
    clrscr();
    a = printf("I\t");
    b = printf("Love\t");
    c = printf("You\t");
    printf("%d%d%d", a,b,c);
    getch();
}
```

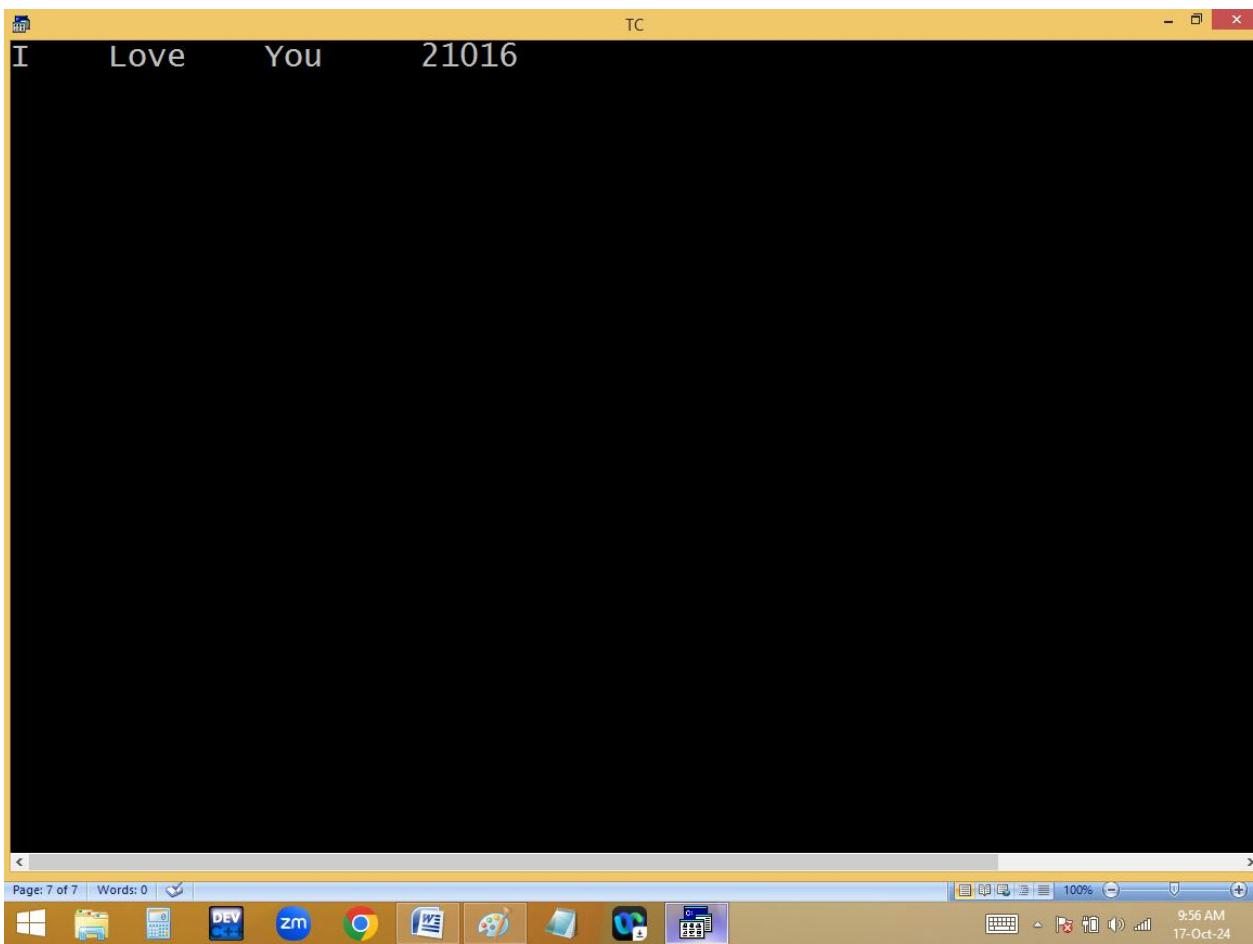
Below the window, the Windows taskbar displays several pinned icons: File Explorer, File History, Task View, Start, Taskbar Settings, DEV, zm, Google Chrome, FileZilla, Paint, OneDrive, and File Cabinet. The system tray shows the date and time as "17-Oct-24" and "9:48 AM".



A screenshot of a Microsoft Windows operating system desktop. In the center is a window titled "TC" which is a copy of the TURBO C++ integrated development environment. The window has a menu bar with "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break". Below the menu bar, it shows "Line 9" and "Col 13". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c;
    clrscr();
    a = printf("I\t");
    b = a * printf("Love\t");
    c = a + b + printf("You\t");
    printf("%d%d%d", a,b,c);
    getch();
}
```

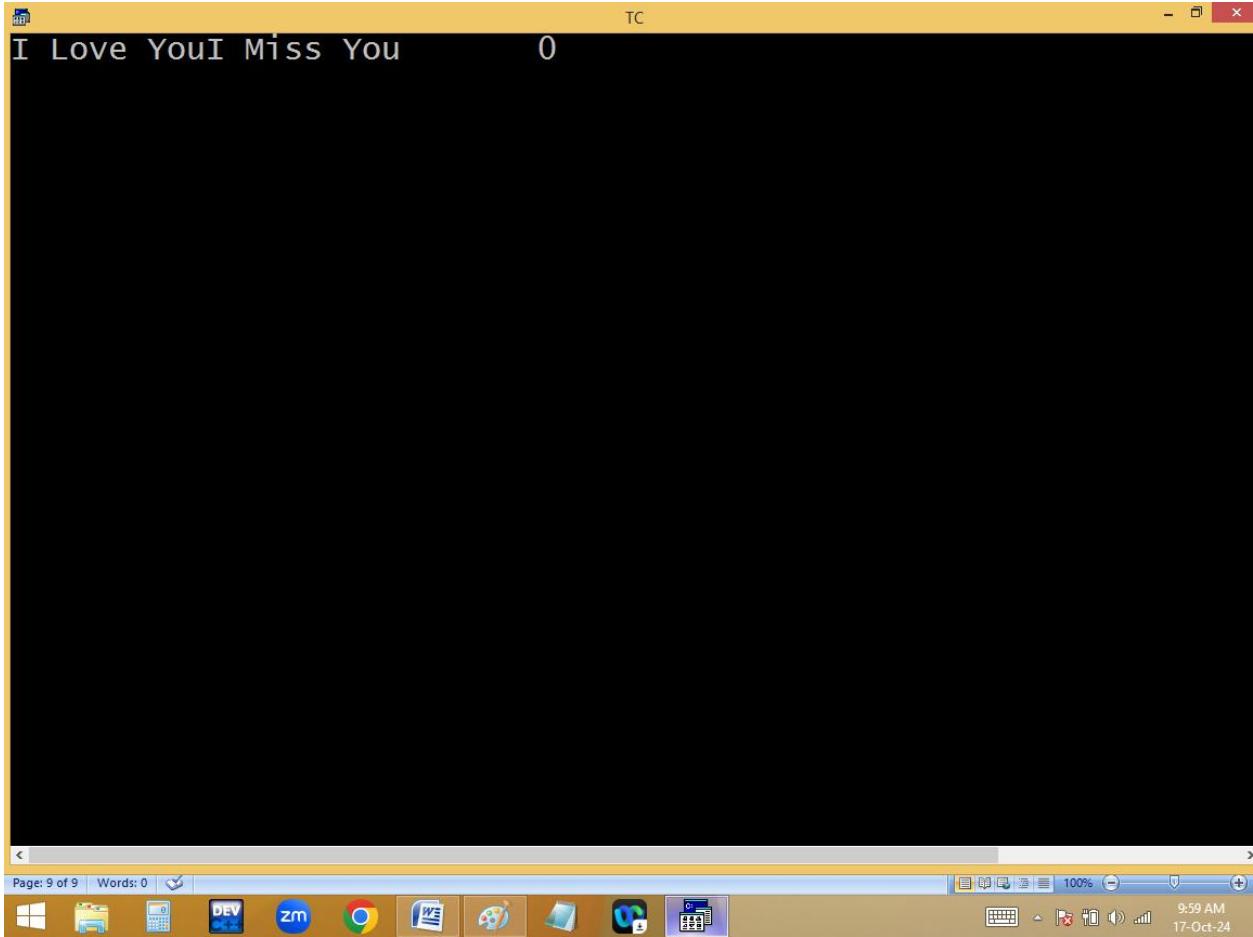
The code prints "I Love You" to the console. At the bottom of the TC window, there is a status bar with keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. Below the TC window is the Windows taskbar, which includes icons for File Explorer, Task View, Start, and other pinned applications like DEV, zm, Google Chrome, and Paint. The system tray shows the date and time as 9:55 AM, 17-Oct-24.



A screenshot of a Microsoft Windows desktop environment. In the center is a window titled "TC" (Turbo C++) with a dark blue background. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break". Below the menu, status text indicates "Line 7 Col 48 Insert Indent Tab Fill Unindent * E:9AM". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a;
    clrscr();
    a = printf("I Love You") / printf("I Miss You\t");
    printf("%d", a);
    getch();
}
```

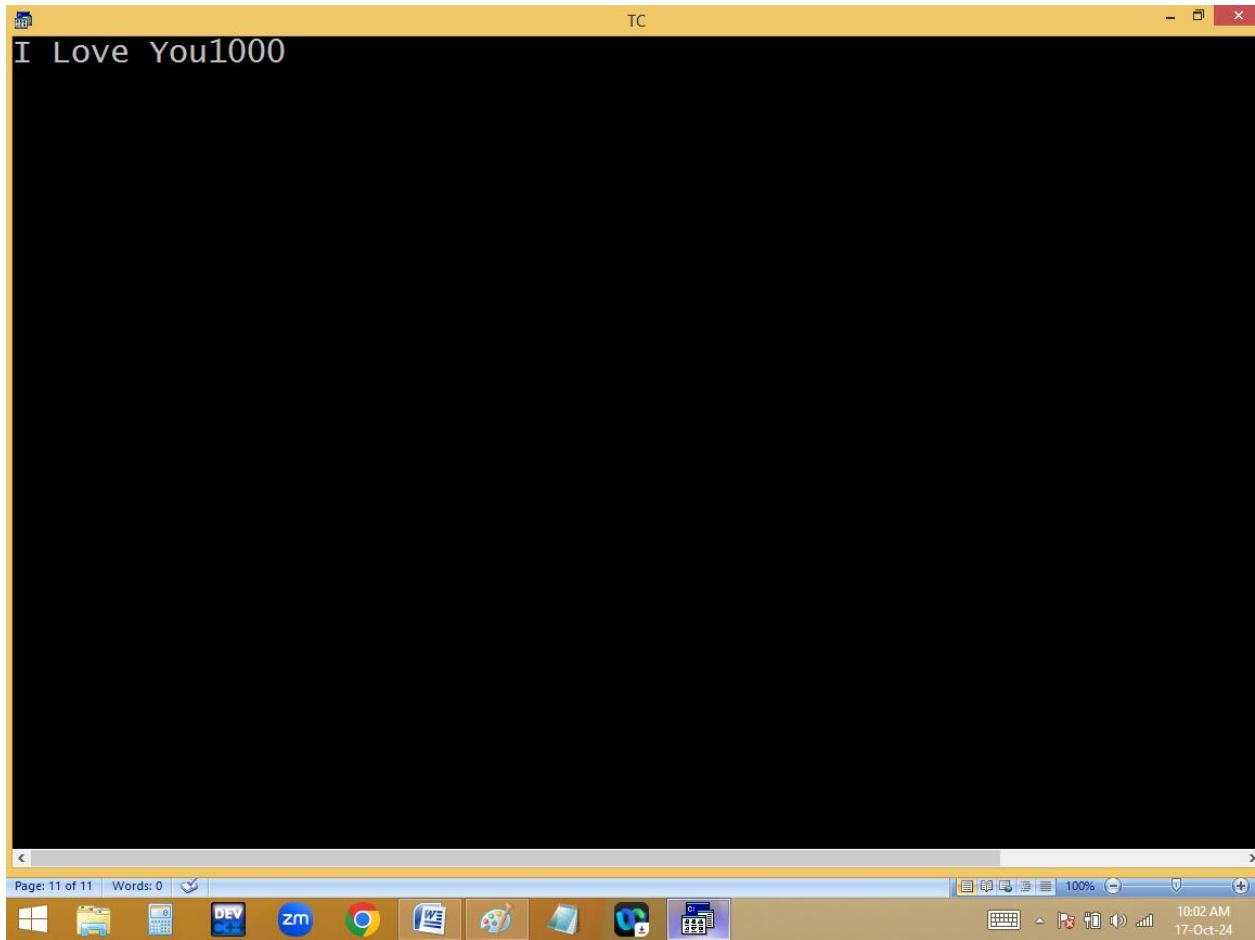
The window has standard Windows-style scroll bars on the right and bottom. At the bottom of the window is a toolbar with various icons. The taskbar at the bottom of the screen shows several pinned application icons: File Explorer, FileZilla, DEV, Zoom, Google Chrome, Notepad, Paint, and Task View. On the far right of the taskbar are system icons for battery, signal strength, and date/time (9:59 AM, 17-Oct-24). The desktop background is a plain light color.



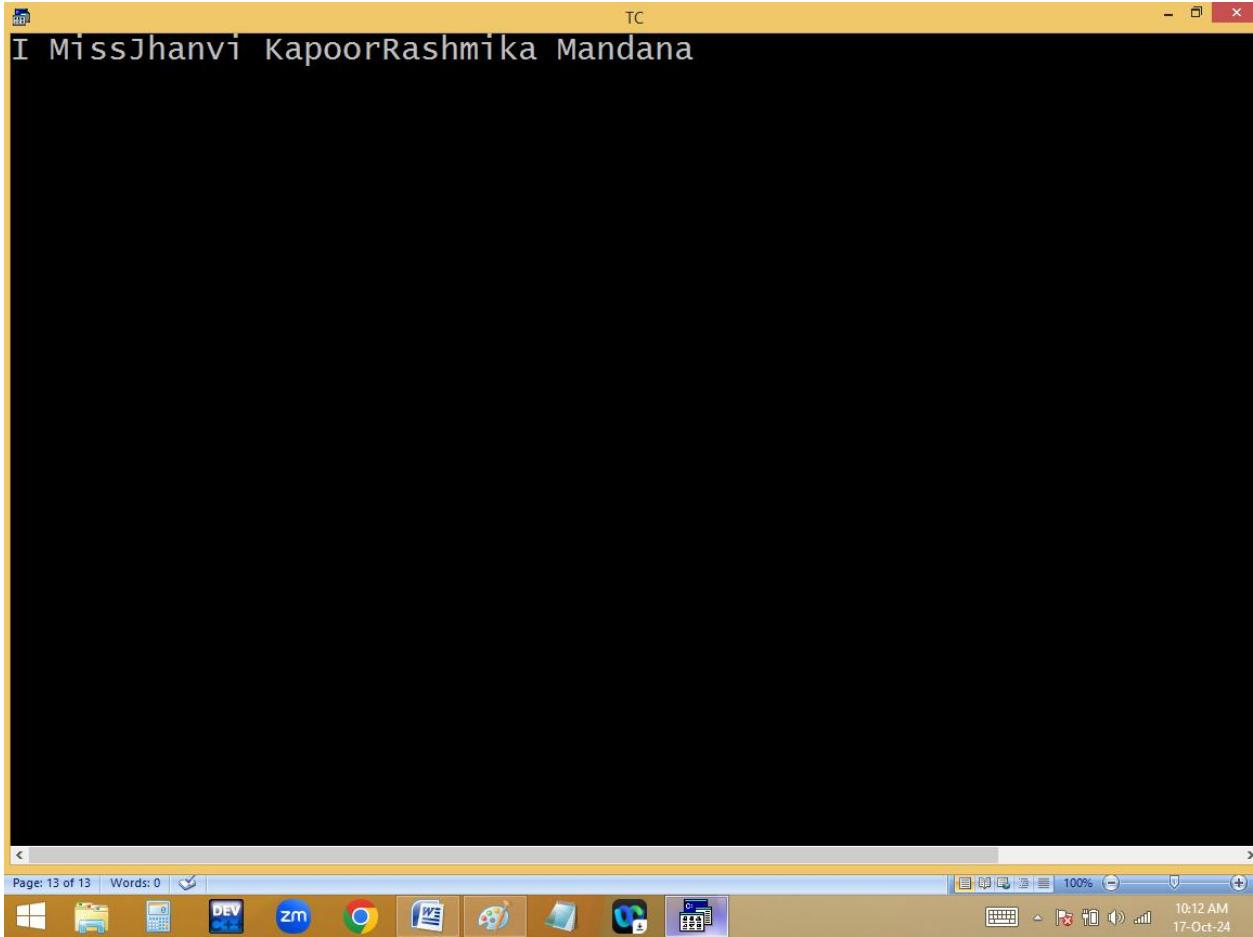
A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar shows Line 7, Col 26, Insert, Indent, Tab, Fill, Unindent, * E:9AM. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c;
    clrscr();
    a = printf("I Love You");
    b = !a;
    c = !!b;
    printf("%d%d%d", a,b,c);
    getch();
}
```

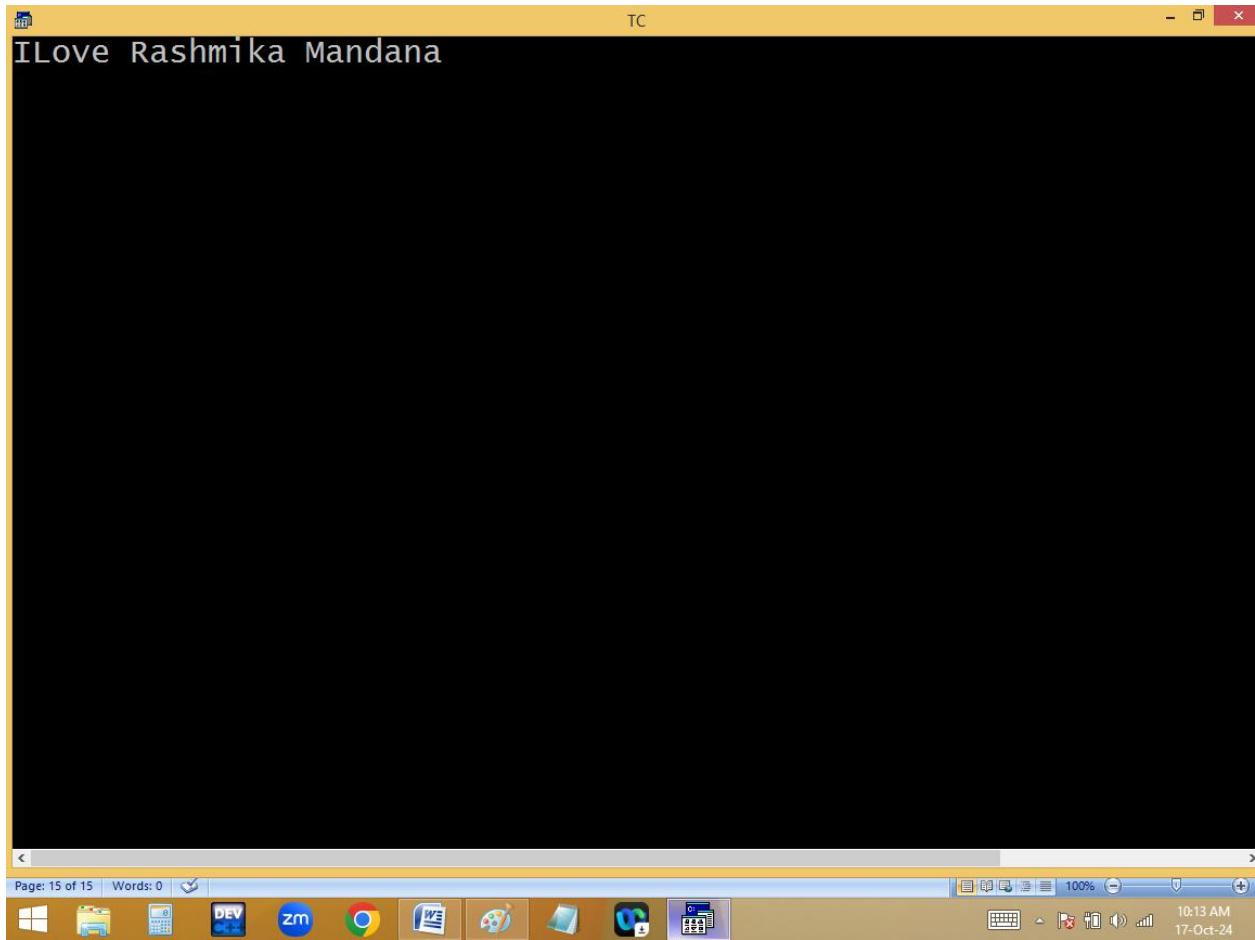
The status bar also displays keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Me. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:02 AM on 17-Oct-24.



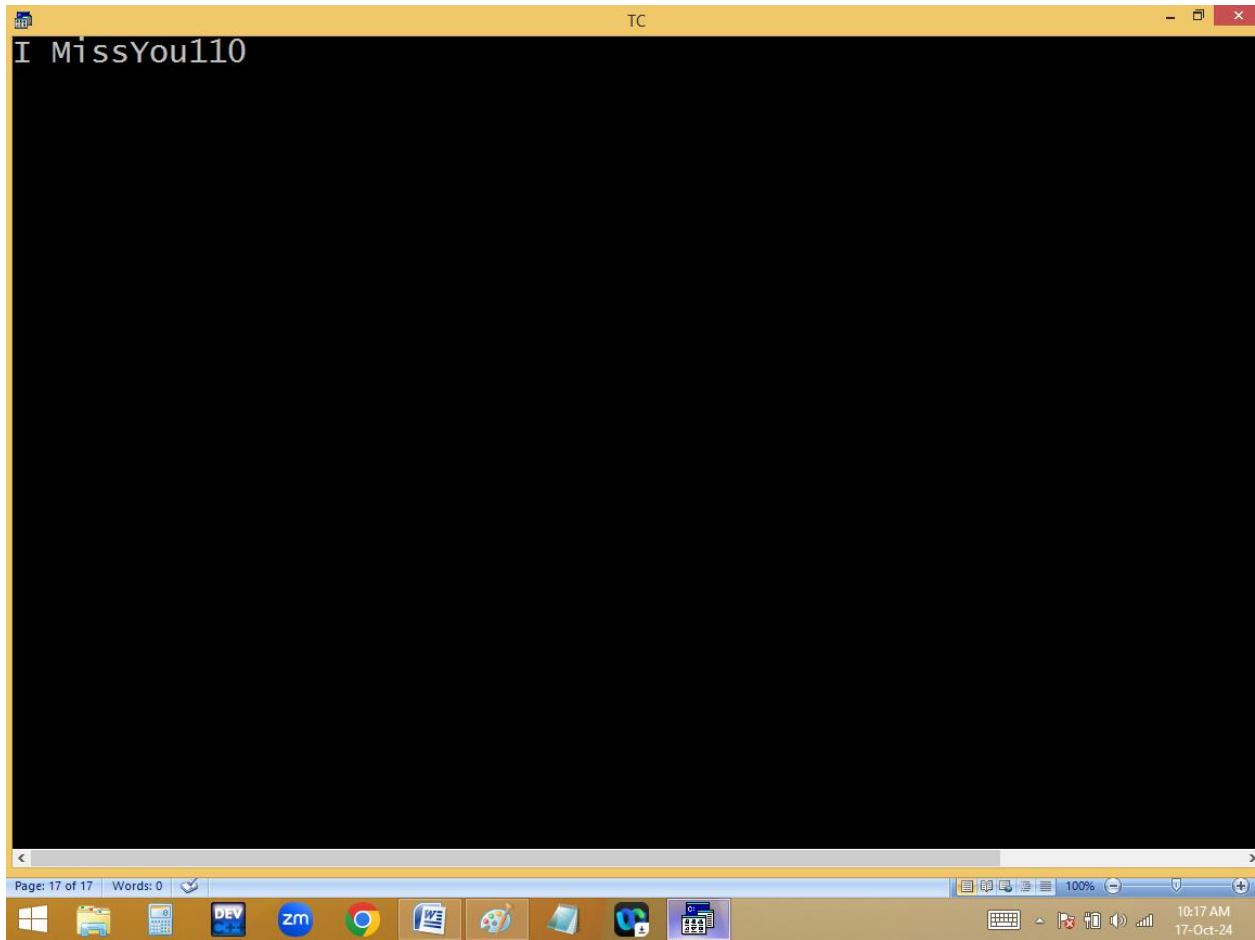
```
TC
File Edit Run Compile Project Options Debug Bre
Line 14 Col 3 Insert Indent Tab Fill Unindent * E:9AM
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("I") || printf("Like");
printf(" ") && printf("Miss");
printf("Jhanvi ") && printf("Kapoor");
printf("") || printf("Rashmika Mandana");
getch();
}
/* In || operation when left exp true, right exp not checked
In && operation when left exp false, right exp not checked
*/
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me
Page: 12 of 12 | Words: 0 | 100% | 10:12 AM | 17-Oct-24
```



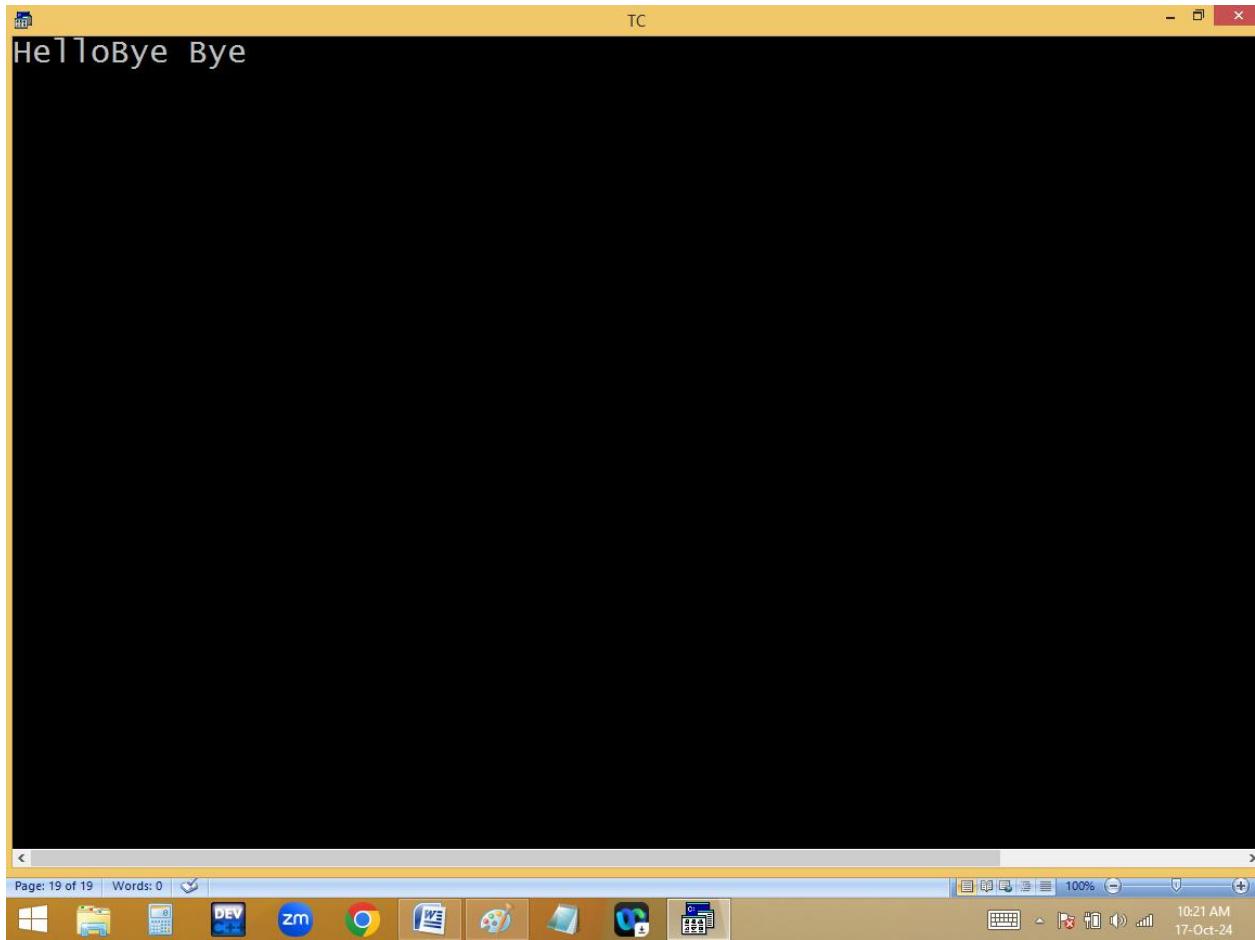
```
TC
File Edit Run Compile Project Options Debug Bre
Line 8 Col 8 Insert Indent Tab Fill Unindent * E:9AM
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("I") || printf("Like");
printf("Love ") || printf("Miss");
printf("") && printf("Jhanvi Kapoor");
printf("") || printf("Rashmika Mandana");
getch();
}
/* In || operation when left exp true, right exp not checked
In && operation when left exp false, right exp not checked
*/
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me
Page: 14 of 14 Words: 0 < >
100% 10:13 AM 17-Oct-24
```



```
TC
File Edit Run Compile Project Options Debug Bre
Line 9 Col 15 Insert Indent Tab Fill Unindent * E:9AM
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
a = printf("I ") || printf("Like");
b = printf("") || printf("Miss");
c = !printf("You") && printf("Jhanvi Kapoor");
printf("%d%d%d",a,b,c);
getch();
}
/* In || operation when left exp true, right exp not checked
In && operation when left exp false, right exp not checked
*/
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me
Page: 16 of 16 Words: 0 ↻ 100% 10:17 AM 17-Oct-24
```



```
TC
File Edit Run Compile Project Options Debug Bre
Line 9 Col 24 Insert Indent Tab Fill Unindent * E:9AM
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
0 && printf("Hi");
1 && printf("Hello");
1 || printf("Thank you");
0 || printf("Bye Bye");
getch();
}
/* In || operation when left exp true, right exp not checked
In && operation when left exp false, right exp not checked
*/
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me
Page: 18 of 18 Words: 0 < > 100% 10:21 AM 17-Oct-24
```



Increment / Decrement / Modify operators[**++/--**]:

They are used to increment or decrement a variable **value by 1**.

Eg:

a=9;

b=4;

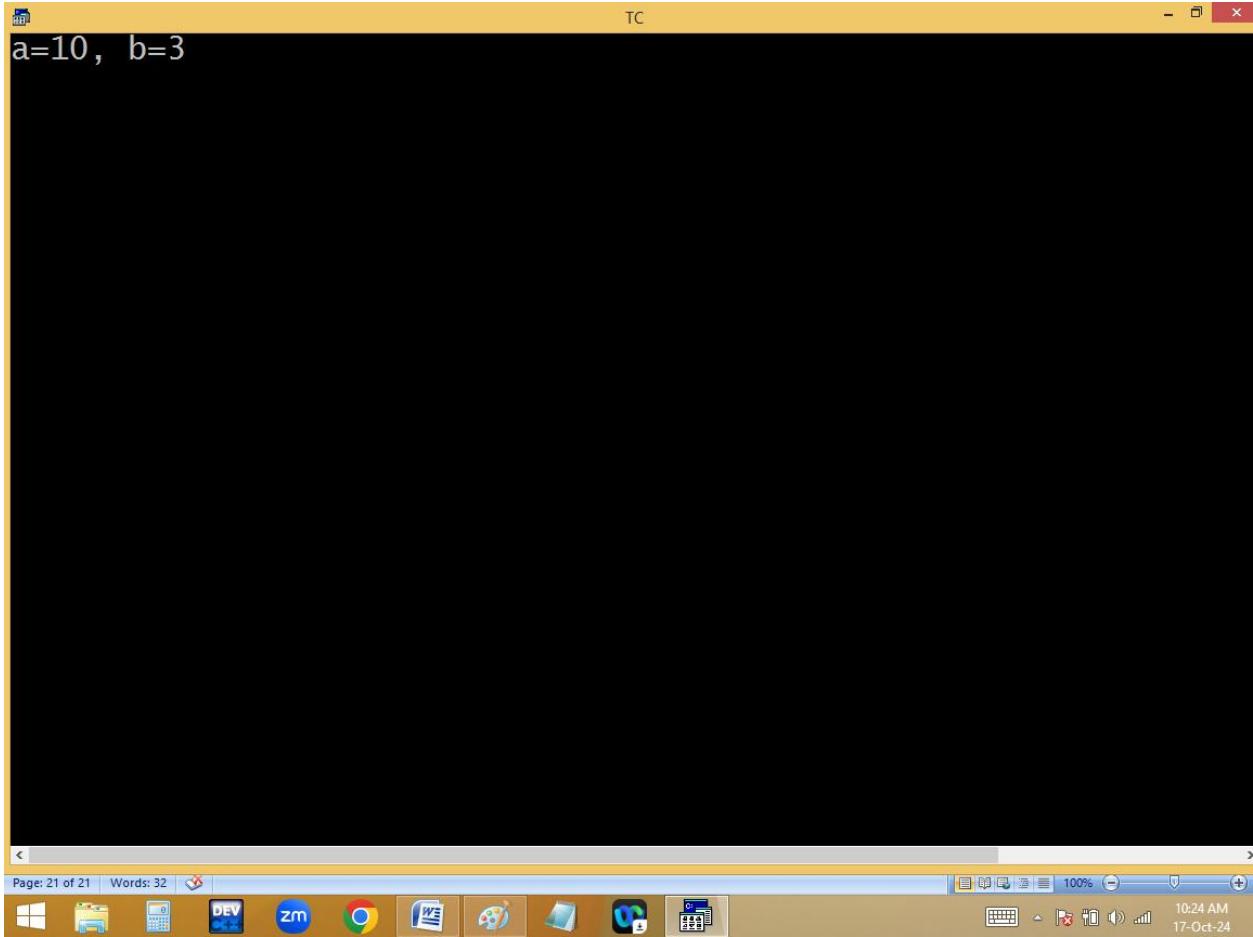
`a++`; i.e. `a=a+1` → `a=10`

`b--`; i.e. `b=b-1` → `b=3`

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom shows "Line 12 Col 1 Insert Indent Tab Fill Unindent * E:9AM". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    a++;
    b--;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

The taskbar at the bottom displays various application icons, including File Explorer, Control Panel, and several browser and utility icons. The system tray shows the date and time as 10:24 AM on 17-Oct-24.



TC

File Edit Run Compile Project Options Debug Bre
Line 8 Col 4 Insert Indent Tab Fill Unindent * E:9AM

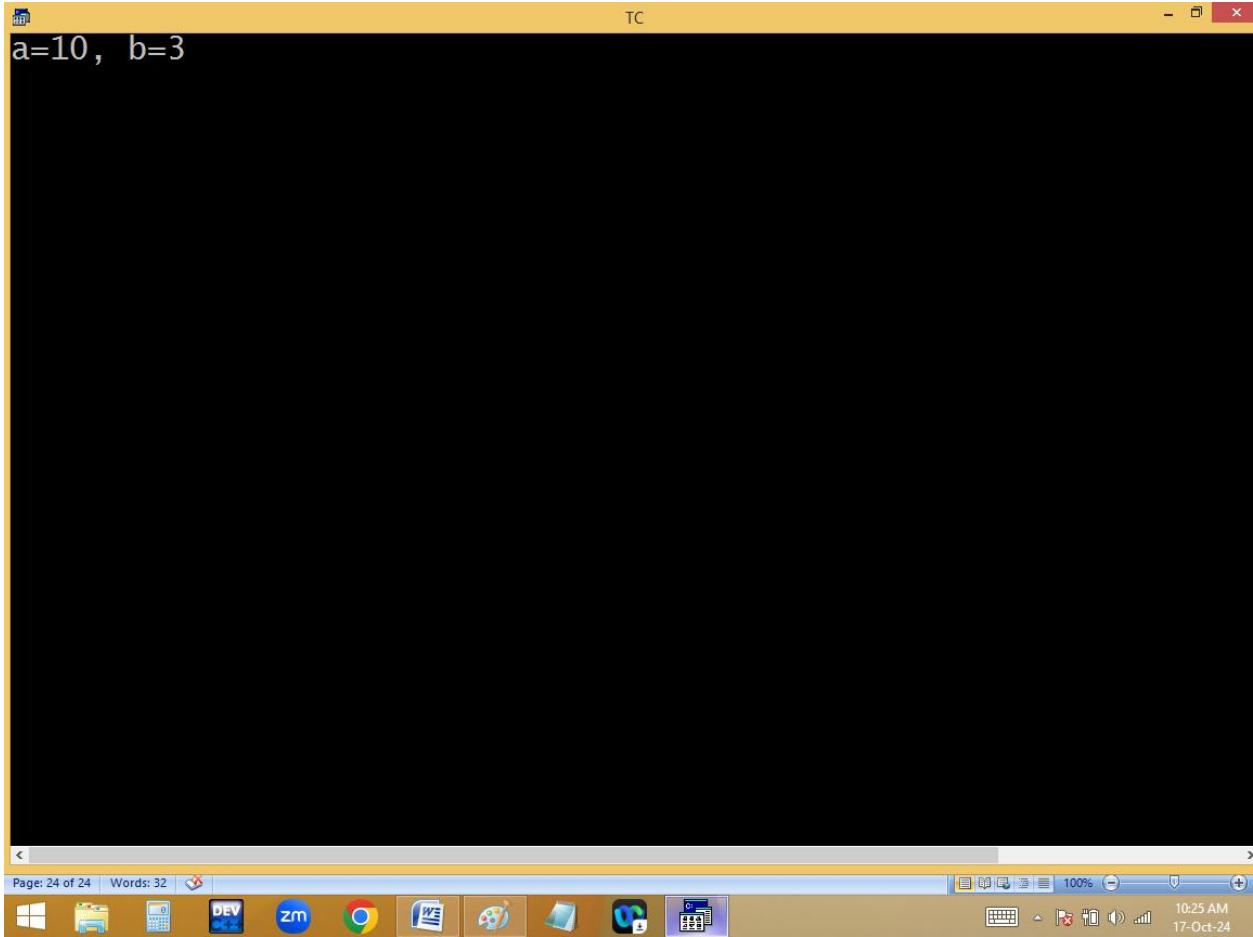
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    ++a;
    --b;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 23 of 23 Words: 32



100% 10:25 AM 17-Oct-24



TC

Error: Lvalue required in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    +++a;
    ---b;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 20 of 25 | Words: 3/32 |

100% 10:27 AM 17-Oct-24

TC

File Edit Run Compile Project Options Debug Bre
Line 8 Col 1 Insert Indent Tab Fill Unindent * E:9AM

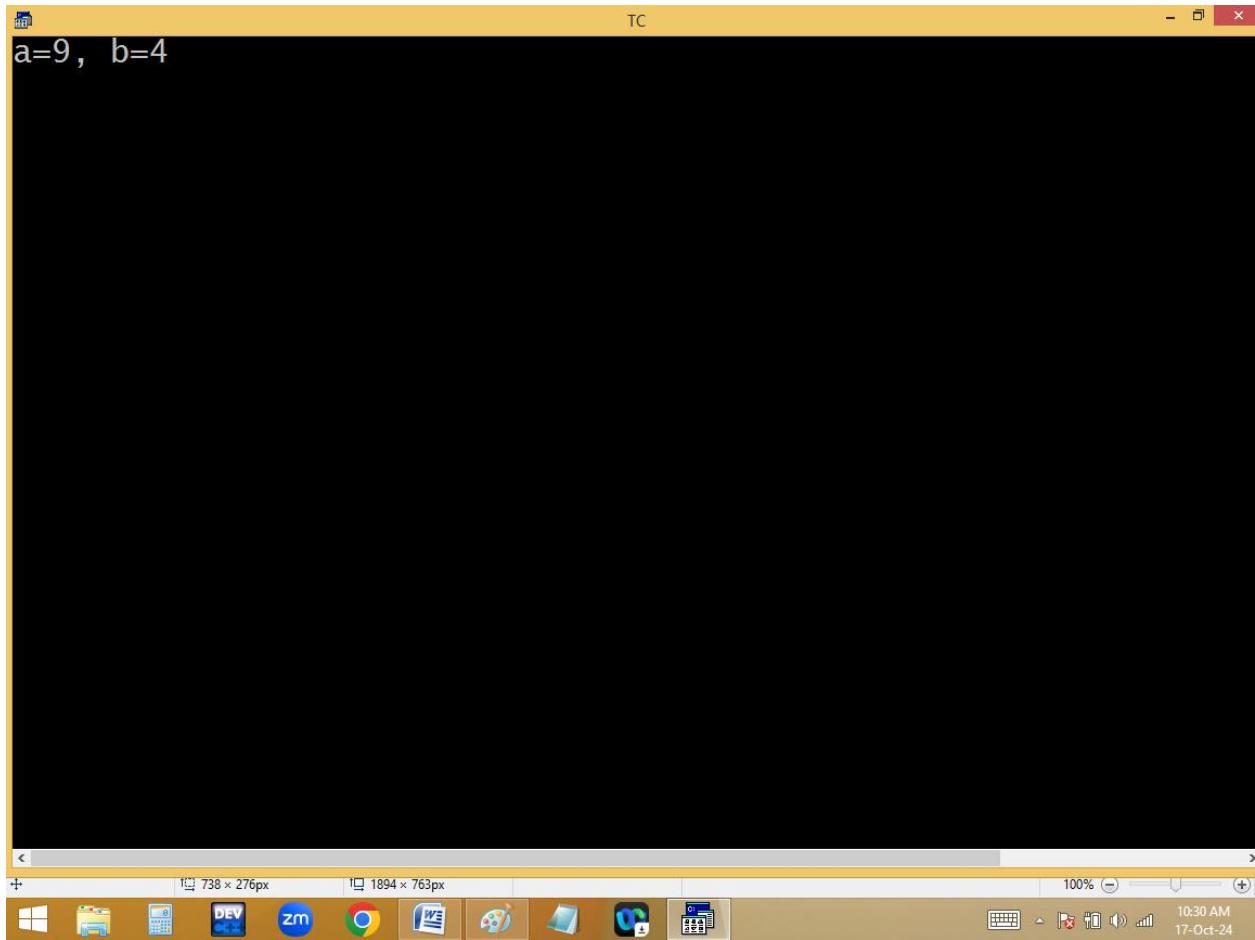
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    +a;
    -b;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 26 of 26 Words: 32



10:30 AM 17-Oct-24



TC

File Edit Run Compile Project Options Debug Bre
Line 8 Col 3 Insert Indent Tab Fill Unindent * E:9AM

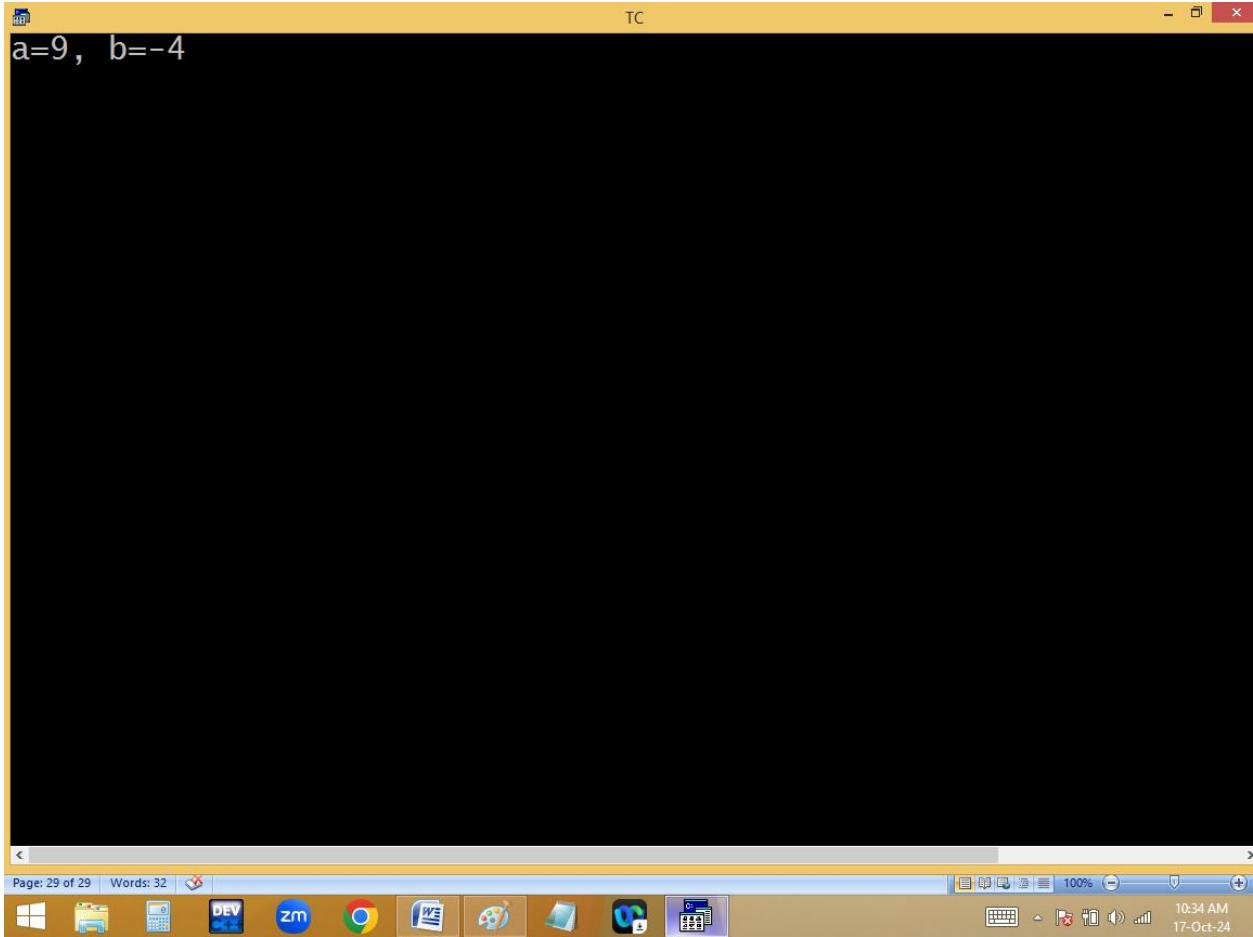
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    a+=a;
    b=-b;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 28 of 28 Words: 32



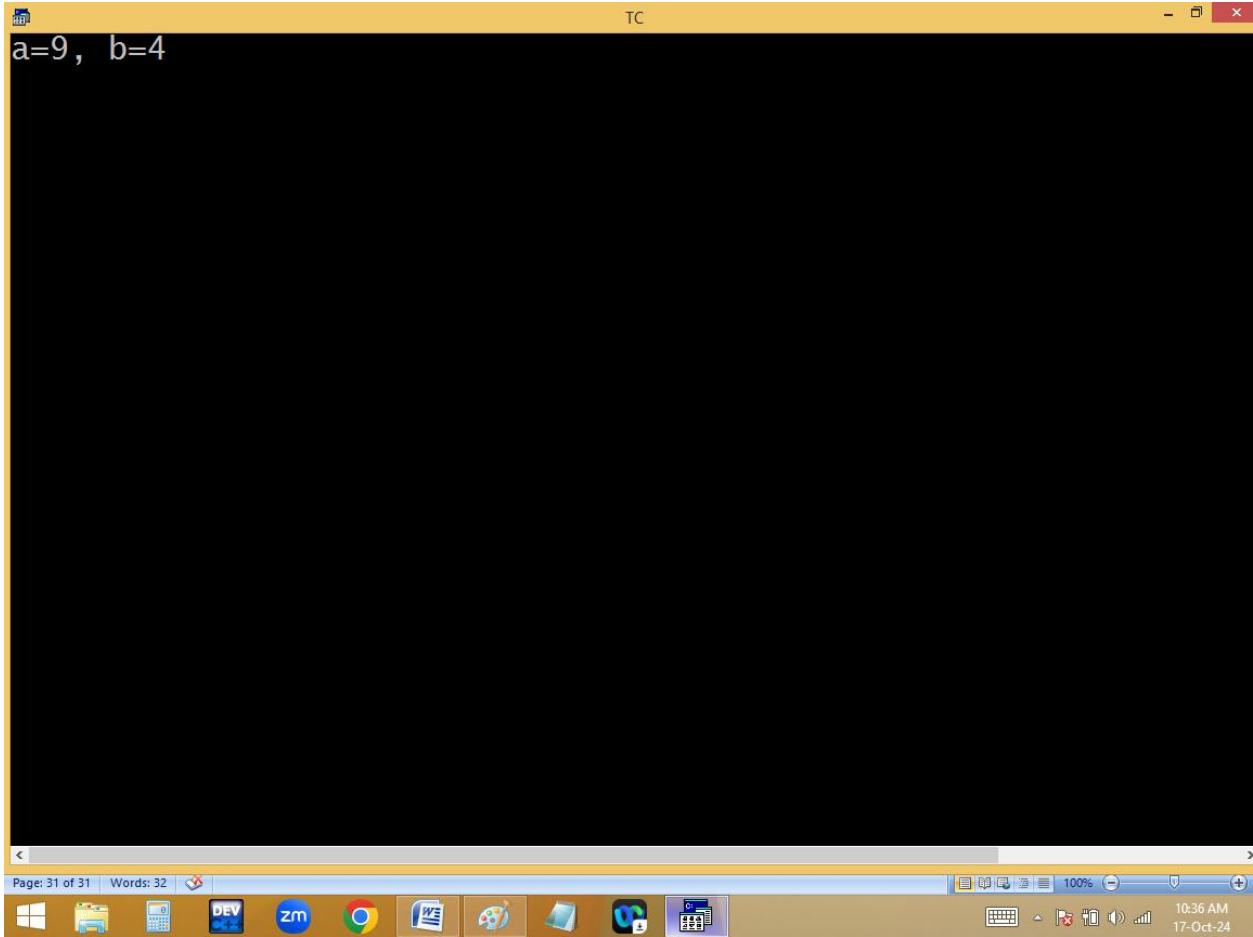
10:34 AM 17-Oct-24



A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break. The status bar at the bottom shows "Line 9 Col 5 TC E:9AM". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    a+5;
    b-3;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

The taskbar at the bottom displays various application icons, including the Start button, File Explorer, Task View, Control Panel, and several system icons. The system tray shows the date and time as "10:36 AM 17-Oct-24".



TC

File Edit Run Compile Project Options Debug Bre
Line 8 Col 3 Insert Indent Tab Fill Unindent * E:9AM

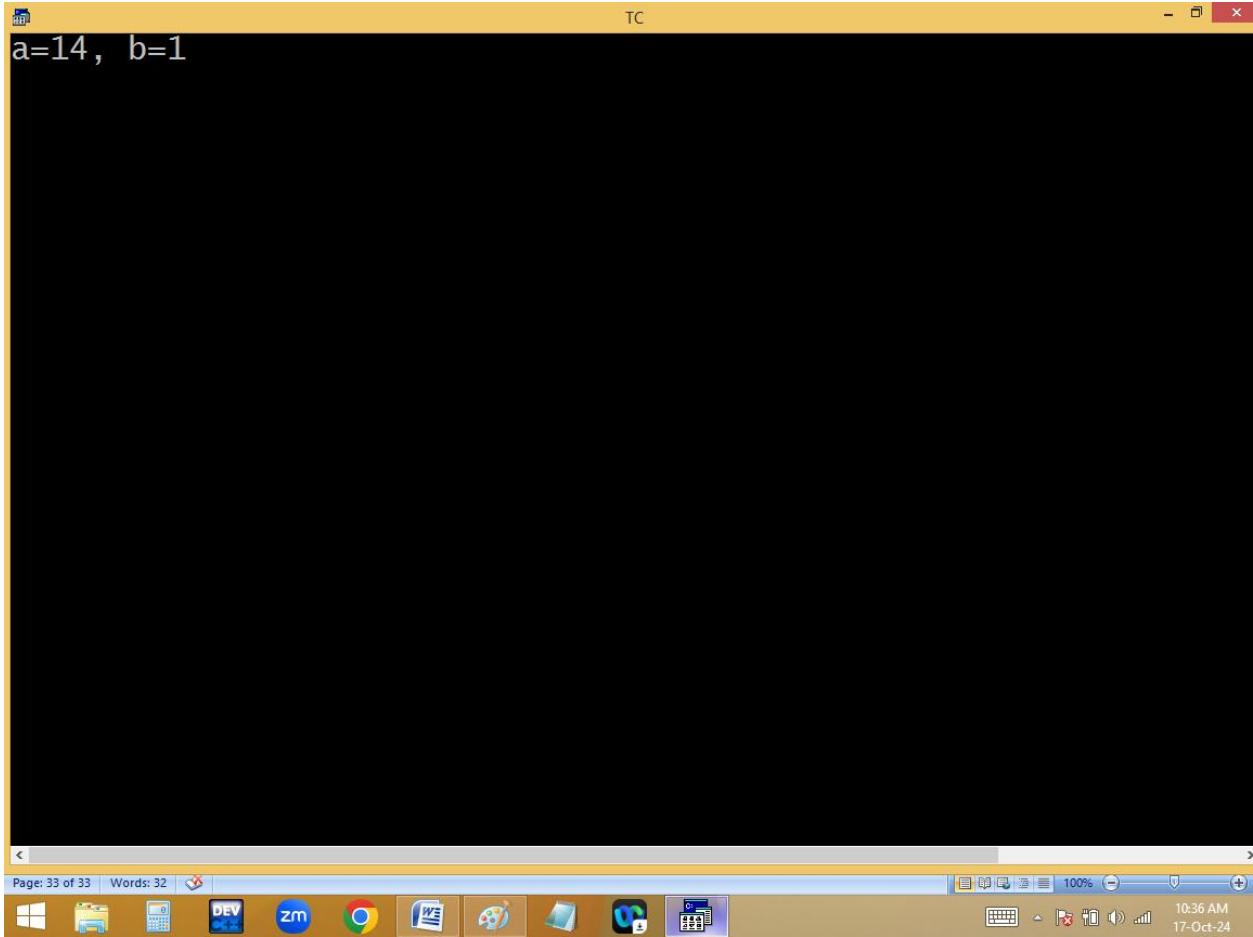
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=9, b=4;
    clrscr();
    a=a+5;
    b=b-3;
    printf("a=%d, b=%d", a, b);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 32 of 32 Words: 32



10:36 AM 17-Oct-24



```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=3, b;
    clrscr();
    b=a++;
    printf("a=%d, b=%d\n",a,b); /* 4 3 */
    a=3;
    b=++a;
    printf("a=%d, b=%d",a,b); /* 4 4 */
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Me

Page: 34 of 34 Words: 32

10:39 AM 17-Oct-24

postfix increment:

a = 3

.

b = a++;

priority: = , a++

1. b = a ==> b = 3

2. a++ ==> a = 4

prefix increment:

a = 3

b = ++a;

priority: ++a, =

1. ++a ==> a = 4

2. b = a ==> b = 4

Note: Until using 2nd variable, pre and post operations are same.


```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=3,b;
    clrscr();
    b = a++ + a++ + a++;
    printf("a=%d, b=%d\n",a,b); /* a=6, b=9 */
    a=3;
    b = ++a + ++a + ++a;
    printf("a=%d, b=%d",a,b); /* a=6, b=18 */
    getch();
}
```

a=3

b = a++ + a++ + a++;

priority: +, =, a++

1. b = a + a + a ==> 3 + 3 + 3

2. **b = 9**

3. a++ ==> a=4, a++ ==> a=5, a++ ==> **a=6**

a=3

b = ++a + ++a + ++a;

priority: ++a, +, =

1. ++a ==> a=4, ++a ==> a=5, ++a ==> **a=6**

2. b = a + a + a ==> 6 + 6 + 6

3. **b = 18**

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar indicates Line 11, Col 40. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=3,b;
    clrscr();
    b = ++a + a++ * ++a;
    printf("a=%d, b=%d\n",a,b); /* a=6, b=30 */
    a=3;
    b = ++a + a-- + a++ + --a;
    printf("a=%d, b=%d",a,b); /* a=3, b=12 */
    getch();
}
```

The terminal window at the bottom shows the output of the program:

```
a=3
b = ++a + a++ * ++a;
priority: ++a, *, +, =, a++
1. ++a==>a=4, ++a==>a=5
2. b = a + a*a ==> 5 + 5*5
3. b = 5 + 25
4. b = 30
5. a++ ==> a=6
```

a=3

b = ++a + a++ * ++a;
priority: ++a, *, +, =, a++
1. ++a==>a=4, ++a==>a=5
2. **b = a + a*a ==> 5 + 5*5**
3. **b = 5 + 25**
4. **b = 30**
5. **a++ ==> a=6**

a=3

b = ++a + a-- + a++ + --a;
priority: ++a,--a,+,-,a++,a--
1. ++a==>a=4
2. --a ==>a=3
3. **b = a+a+a+a==>3+3+3+3**
4. **b=12**
5. **a++==>a=4**
6. **a-- ==>a=3**

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar indicates Line 9, Col 39. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=3,b=2;
    clrscr();
    a = a++ + ++b;
    b = ++a + b++;
    printf("a=%d, b=%d",a,b); /* a=8, b=12 */
    getch();
}
```

The status bar at the bottom right shows the date and time: 9:49 AM 18-Oct-24.

a=3, b=2

a = a++ + ++b;
priority: ++b, +, =, a++
1. ++b ==> b=3
2. a = a + b ==> 3 + 3
3. a = 6
4. a++ ==> a=7

a=7, b=3

b = ++a + b++;
priority: ++a, +, =, b++
1. ++a ==> a=8
2. b = a + b ==> 8 + 3
3. b = 11
4. b++ ==> b=12

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 11, Col 1, Insert, Indent, Tab, Fill, Unindent, and *. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=30;
    clrscr();
    a++/2;
    printf("a=%d\n",a); /* a=31 */
    ++a/2;
    printf("a=%d",a); /* a=32 */
    getch();
}
```

The terminal window below the editor displays the output of the program:

```
a=30
a++/2;
priority: /, a++
1. a/2 ==> 30/2=15 [ 15 not stored in a because of = not used i.e. a = 30 ]
2. a++ ==> a=31
printf(a) ==> 31
++a/2;
priority: ++a, /
1. ++a ==> a=32
2. a/2 ==> 32/2=16 [ 16 not stored in a because of = not used i.e. a=32 ]
printf(a) ==> a=32
```

a=30

a++/2;

priority: /, a++

1. a/2 ==> 30/2=15 [15 not stored in a because of = not used i.e. a = 30]

2. a++ ==> a=31

printf(a) ==> 31

++a/2;

priority: ++a, /

1. ++a ==> a=32

2. a/2 ==> 32/2=16 [16 not stored in a because of = not used i.e. a=32]

printf(a) ==> a=32

TC

File Edit Run Compile Project Options Debug
Line 10 Col 25 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=30;
    clrscr();
    a=a++/2;
    printf("a=%d\n",a); /* a=16 */
    a=++a/2;
    printf("a=%d",a); /* a=8 */
    getch();
}
```



10:04 AM
18-Oct-24

a=30

a=a++/2; priority: /,=,a++

1. a=a/2==>30/2

2. a=15

3. a++ ==>a=16

printf(a) ==> 16

a=++a/2; priority: ++a,/,-

1. ++a==>a=17

2. a=a/2 ==> 17/2

3. a=8

printf(a)==> 8

TC

File Edit Run Compile Project Options Debug
Line 8 Col 30 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=30;
    clrscr();
    printf("a=%d\n",a++/2); /* a=15 */
    printf("a=%d",++a/2); /* a=16 */
    getch();
}
```



10:07 AM
18-Oct-24

The screenshot shows a window titled "TC" (Turbo C++) with a menu bar including File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates "Line 8 Col 15". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=30;
    clrscr();
    printf("a=%d\n",a++/2); /* a=15 */
    printf("a=%d\n",++a/2); /* a=16 */
    printf("a=%d",a);
    getch();
}
```

The status bar at the bottom shows system icons and the time "10:11 AM" and date "18-Oct-24".

a=30

printf("a=%d\n", a++/2); priority: /, printf, a++

1. a/2 ==> 30/2 = 15

2. **printf(15)** ==> 15 [15 printed not stored i.e. a=30]

3. a++ ==> a=31

printf("a=%d",++a/2); priority: ++a, /, printf

1. ++a ==> a=32

2. a/2 ==> 32/2=16

3. **printf(16)** ==> 16 [16 printed not stored i.e. a=32]

printf(a) ==> 32

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom right shows the time as 10:12 AM and the date as 18-Oct-24. The code editor contains the following C program:

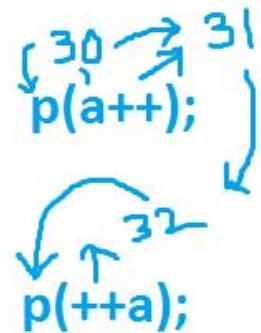
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=30;
    clrscr();
    printf("a=%d\n",a++);
    /* a=30 */
    printf("a=%d\n",++a); /* a=32 */
    getch();
}
```

a=30

p(a++); priority: printf, a++

printf(a) ==> a=30

a++ ==> 31



p(++a); priority: ++a, printf

++a ==> a=32

printf(a) ==> 32

The screenshot shows a window titled "TC" (Turbo C++) with a menu bar including File, Edit, Run, Compile, Project, Options, and Debug. A red error message at the top reads "Error: Lvalue required in function main". Below the menu, the code is displayed:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n",30++); /* Error */
printf("%d\n",++31); /* Error */
getch();
}
```

The status bar at the bottom shows the date and time: 10:16 AM 18-Oct-24.

a++ means $a=a+1$

30++ means $30=30+1 \Rightarrow 30=31$

constant constant

Error

The screenshot shows a Windows desktop environment with the Turbo C++ IDE window open. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. A red error message 'Error: Lvalue required in function main' is displayed at the top. The code in the editor is:

```
TC
File Edit Run Compile Project Options Debug
Error: Lvalue required in function main
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=2, b=7, c;
    clrscr();
    c = (a++ + ++b)++; /* Error */
    printf("a=%d, b=%d, c=%d",a,b,c);
    getch();
}
```

The system tray shows various icons, and the taskbar at the bottom displays several application icons.

a=2 b=7

c = (a++ + ++b)++;

priority: ++b, +, =, a++

1. ++b ==> 8

2. c = a + b ==> 2+8 ==> 10++ ==> **Error**

TC

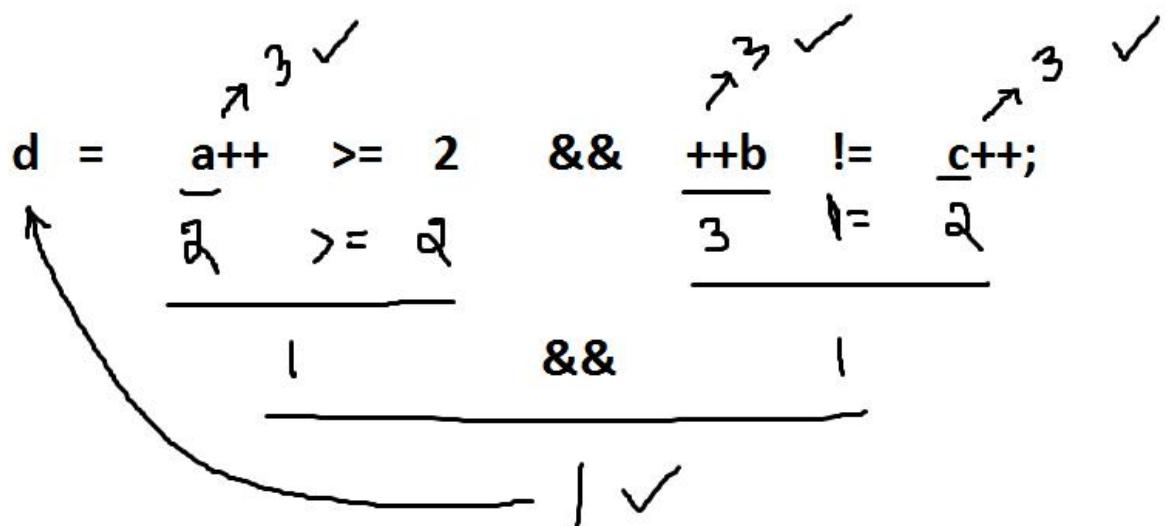
File Edit Run Compile Project Options Debug
Line 12 Col 25 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c,d;
    clrscr();
    a=b=c=2;
    d = a++ >=2 && ++b != c++;
    printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);
    getch();
}
/* a=3, b=3, c=3, d=1 */
```

a=2 b=2 c=2

$$d = \frac{a++ >= 2}{\underline{2} >= \underline{2}} \quad \&\& \quad \frac{++b != c++}{\underline{3} \neq \underline{2}}$$

| ✓



The screenshot shows a Microsoft Windows desktop with a dark blue theme. A window titled "TC" is open, representing the Turbo C++ compiler. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", "Line 12", "Col 12", "Insert", "Indent", "Tab", "Fill", and "Unindent". The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c,d;
    clrscr();
    a=b=c=2;
    d = a++ >= b++ && ++b != c++;
    printf("a=%d, b=%d, c=%d, d=%d", a, b, c, d);
    getch();
}
/* a=3, b=4, c=3, d=1 */
```

The status bar at the bottom shows icons for various applications like File Explorer, Task View, and Start, along with the date and time "18-Oct-24" and "10:29 AM".

a=2 b=2 c=2

$d = \frac{a++ >= b++ \&& \frac{++b}{4} != c++}{2 >= 2}$

 | && |

| ✓

$$a=2 \quad b=2 \quad c=2 \quad \checkmark$$

d = a++ >= ++b && ++b != _c++;

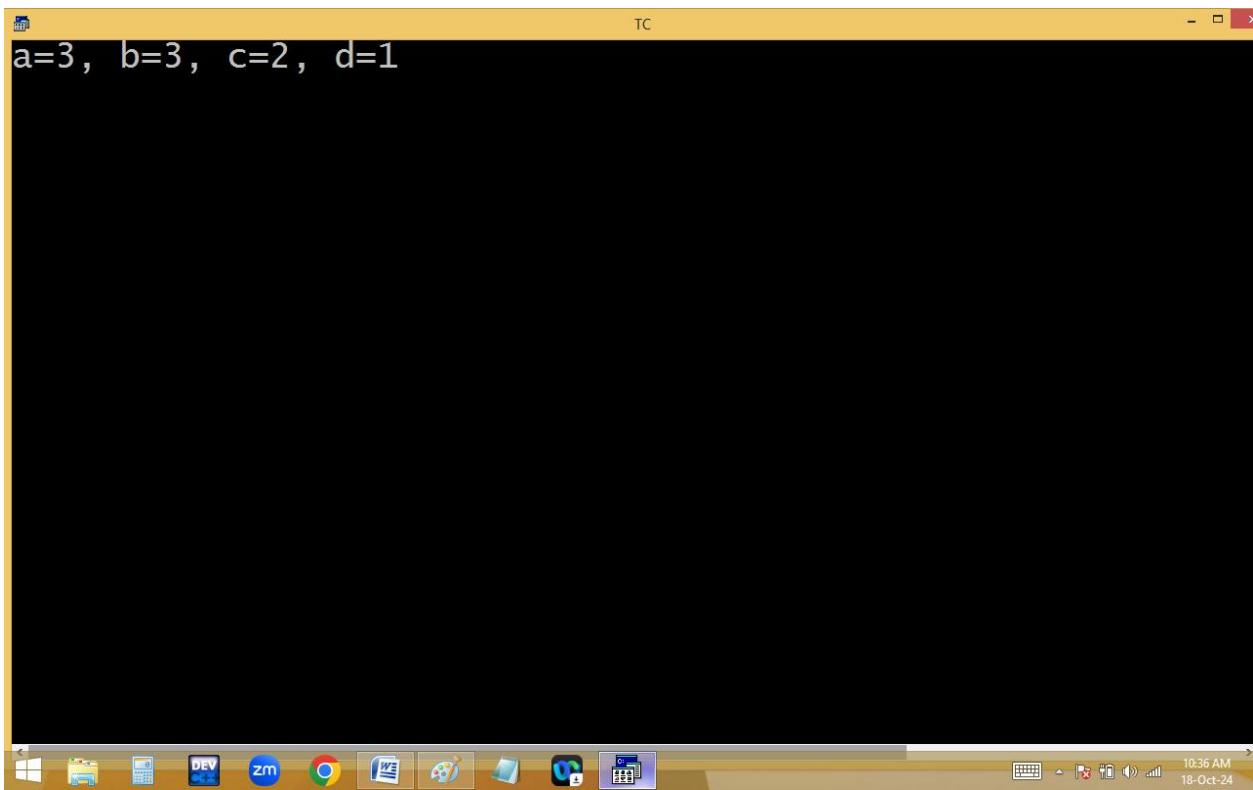
Not checked

Note: In `&&` operation when left exp false, right exp not checked

The screenshot shows the Microsoft Visual Studio Code interface running on a Windows operating system. The title bar displays "TC" and the menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status information shows "Line 12 Col 22 Insert Indent Tab Fill Unindent *". The main editor area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b,c,d;
    clrscr();
    a=b=c=2;
    d = a++ >= b++ || ++b != c++;
    printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);
    getch();
}
/* a=3, b=3, c=2, d=1 */
```

The taskbar at the bottom shows icons for various applications including FileZilla, Zoom, and Microsoft Edge. The system tray in the bottom right corner shows the date and time as "18-Oct-2014 10:36 AM".



a=2 b=2 c=2 ✓

d = $\frac{a++ >= b++}{\cancel{a} >= \cancel{d}}$ || $\frac{++b != c++}{}$

Not checked

Note: In || operation when left exp true, right exp not checked

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The status bar at the top indicates Line 11, Col 12, and various edit options like Insert, Indent, Tab, Fill, and Unindent. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0,b=1,c=2,d;
    clrscr();
    d = a++ || ++b || --c;
    printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);
    getch();
}
/* a=1, b=2, c=2, d=1 */
```

The status bar at the bottom right shows the date and time: 10:41 AM 18-Oct-24.

a=0 b=1 c=2 ✓

d = $\frac{a++}{\square}$ || $\frac{++b}{|}$ || $\frac{--c}{|}$ ✓
Not checked

```
Line 11 Col 12 Insert Indent Tab Fill Unindent
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0,b=1,c=2,d;
clrscr();
d = a++ && ++b || --c;
printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);
getch();
}
/* a=1, b=1, c=1, d=1 */
```

a=0 b=1 ✓ c=2

```
d = a++ && ++b || --c;
```

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The status bar at the top shows "Line 11 Col 22 Insert Indent Tab Fill Unindent". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0,b=1,c=2,d;
    clrscr();
    d = a++ && ++b && --c;
    printf("a=%d, b=%d, c=%d, d=%d",a,b,c,d);
    getch();
}
/* a=1, b=1, c=2, d=0 */
```

The status bar at the bottom right shows the date and time: 10:48 AM 18-Oct-24.

a=0 b=1 ✓ c=2 ✓

d = a++ && ++b && --c;

Annotations on the code:
- A red arrow points to the first '+' in 'a++'.
- A red arrow points to the second '+' in '++b'.
- A red arrow points to the '-' in '--c'.
- A red checkmark is placed after the first 'b' in '++b'.
- A red checkmark is placed after the first 'c' in '--c'.

The image shows a screenshot of a Windows operating system desktop. At the top, there is a taskbar with various icons. Below the taskbar is a terminal window titled "TC". The terminal window has a menu bar with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom of the terminal window displays "Line 8 Col 44 Insert Indent Tab Fill Unindent * E:9AM.C". The main area of the terminal window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=2;
clrscr();
printf("%d,%d,%d,%d,%d\n",++a,a++,a--,--a,++a);
printf("%d,%d,%d,%d,%d\n",++a,a*10,a=10,a++,++a);
getch();
}
/* In printf execution order right to left and printing left to right */
```

When the code is run, the terminal window displays the output:

```
3,1,2,2,3
11,100,10,4,4
```

a=2

3

2

1

2

3

a value

++a

a++

a--

--a

++a

3

1

2

2

3

output

11

10

10

5

4

a value

++a

a*10

a=10

a++

++a

11

100

10

4

4

output

The screenshot shows a Windows operating system interface with two open windows.

The top window is a terminal window titled "TC". It displays the following C code:

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

The output of the code execution is visible in the terminal window:

```
21
Hi
4, 4, 3
5-
```

The bottom window is a file editor titled "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom of the editor window shows "Line 9 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C".

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=2,b;
    clrscr();
    b=a++ + a++ + a++;
    printf("a=%d, b=%d\n",a,b);
    a=2;
    b=++a + ++a + ++a;
    printf("a=%d, b=%d\n",a,b);
    getch();
}
```

The terminal output shows two sets of results:

```
a=5, b=6
a=5, b=15
```

The desktop taskbar at the bottom shows various icons for applications like File Explorer, Task View, and system utilities. The system tray in the bottom right corner indicates the date and time as 9:43 AM on 19-Oct-24.

C:\Users\kishore sir\Desktop\11am\in.cpp - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

TDM-GCC 4.9.2 32-bit Release

Project Classes Debug in.cpp

```
1 #include<stdio.h>
2 int main()
3 {
4     int a=2,b;
5     b=a++ + a++ + a++;
6     printf("a=%d, b=%d\n",a,b);
7     a=2;
8     b=++a + ++a + ++a;
9     printf("a=%d, b=%d\n",a,b);
10 }
11
```

Compiler Resources Compile Log Debug Find Results

Line: 11 Col: 1 Sel: 0 Lines: 11 Length: 155 Insert Done parsing in 0.063 seconds

9:44 AM 19-Oct-24

a=5, b=9
a=5, b=13

Process exited after 0.01439 seconds with return value 0
Press any key to continue . . .

9:45 AM 19-Oct-24

$$a = \cancel{2} \cancel{3} \cancel{4} \cancel{5} \quad \checkmark$$

$$1 \cancel{3} \quad \cancel{4} \quad \cancel{5}$$

$$b = \underline{a++ + a++ + a++}$$

$$\overbrace{2 + 3 + 4}$$

$$9 \quad \checkmark$$

$$a = \cancel{2} \cancel{3} \cancel{4} \cancel{5} \quad \checkmark$$

$$b = \underline{++a + ++a + ++a;}$$

$$\overbrace{\cancel{4} + \cancel{4}}$$

$$\overbrace{8 + 5}$$

$$13 \quad \checkmark$$

Compound assignment / short hand operators:

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

+=, -=, *=, %=, /=, <<=, >>=, ^=,

Eg:

int a=10, b=3;

float c=5;

a+=7; i.e. a=a+7 \rightarrow a=10+7=17

b*=4; i.e. b=b*4 \rightarrow b=3*4=12

c/=2; i.e. c=c/2 \rightarrow c=5/2=2.500000

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=10,b=3;
    float c=5;
    clrscr();
    a+=7;
    b*=4;
    c/=2;
    printf("a=%d, b=%d, c=%f",a,b,c);
    getch();
}
```

Below the code, the terminal displays the output of the program:

```
a=17, b=12, c=2.500000
```

The desktop background is black. At the bottom, there is a taskbar with several pinned icons, including File Explorer, Edge browser, and various application icons. The system tray shows the date and time as "9:58 AM 19-Oct-24". The title bar of the terminal window also displays "TC" and the status bar shows "Line 12 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C".

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in the Turbo C++ IDE.

The terminal window title bar reads "TC" and the menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". Status information at the top of the window indicates "Line 5 Col 9 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the terminal window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,b;
float c;
clrscr();
printf("Enter a, b , c values ");
scanf("%d %d %f",&a, &b, &c);
a+=7;
b*=4;
c/=2;
printf("a=%d, b=%d, c=%f",a,b,c);
getch();
}
```

The terminal window also displays the system tray icons and the taskbar at the bottom, which includes icons for File Explorer, Task View, Start, Taskbar View, Task Manager, and others. The taskbar shows the date and time as "10:08 AM 19-Oct-24".

```
TC
Enter a, b , c values
8
25
10.5
a=15, b=100, c=5.250000

Enter a, b , c values 4    9
a=11, b=28, c=4.500000

Enter a, b , c values 4    9
a=11, b=28, c=4.500000
```

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays C code and its execution output.

Code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,b;
float c;
clrscr();
printf("Enter a value ");
scanf("%d",&a);
printf("Enter b value ");
scanf("%d",&b);
printf("Enter c value ");
scanf("%f",&c);
a+=7;
b*=4;
c/=2;
printf("a=%d, b=%d, c=%f",a,b,c);
getch();
}
```

Output:

```
Enter a value 1
Enter b value 2
Enter c value 3
a=8, b=8, c=1.500000
```

The terminal window is titled "TC". The status bar at the bottom of the window shows the date and time: "10:15 AM 19-Oct-24". The taskbar at the bottom of the screen also displays the date and time: "10:15 AM 19-Oct-24".

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,b=5;
clrscr();
a+=7+b; /* a = a + 7 + b */
printf("a=%d, b=%d",a,b);
getch();
}
```

The terminal window also displays the keyboard layout and system status at the bottom.

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

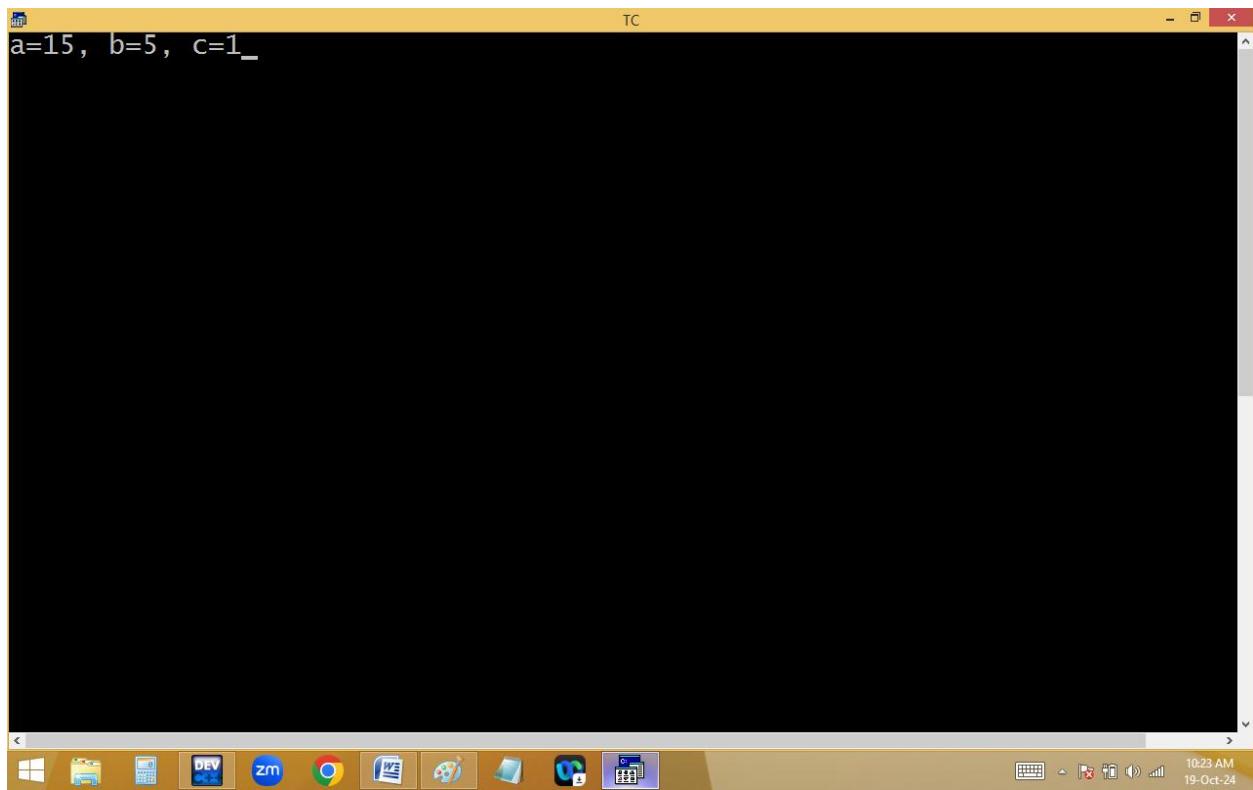
TC

a=22, b=5

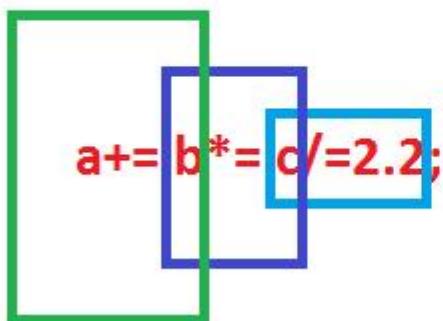
A screenshot of a Microsoft Windows operating system desktop. In the center is a window titled "TC" which is a TURBO C++ integrated development environment. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom of the window shows "Line 8 Col 32 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10.4,b=5.2, c=3.3;
clrscr();
a+=b*=c/=2.2;
printf("a=%d, b=%d, c=%d",a,b,c);
getch();
}
```

The taskbar at the bottom of the screen displays several pinned icons, including the Start button, File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, FileZilla, Paint, Snipping Tool, and Task Manager. The system tray shows the date and time as "10:23 AM 19-Oct-24".



```
int a=10 b=5 c=3
```



$$c /= 2.2 \Rightarrow c = c / 2.2 \rightarrow 3 / 2.2 = 1 \quad \checkmark$$

$$b *= c \Rightarrow b = b * c \Rightarrow 5 * 1 = 5 \quad \checkmark$$

$$a += b \Rightarrow a = a + b \Rightarrow 10 + 5 = 15 \quad \checkmark$$

Address operators:

1. & - Address of the variable
2. * - pointer – Address of another variable

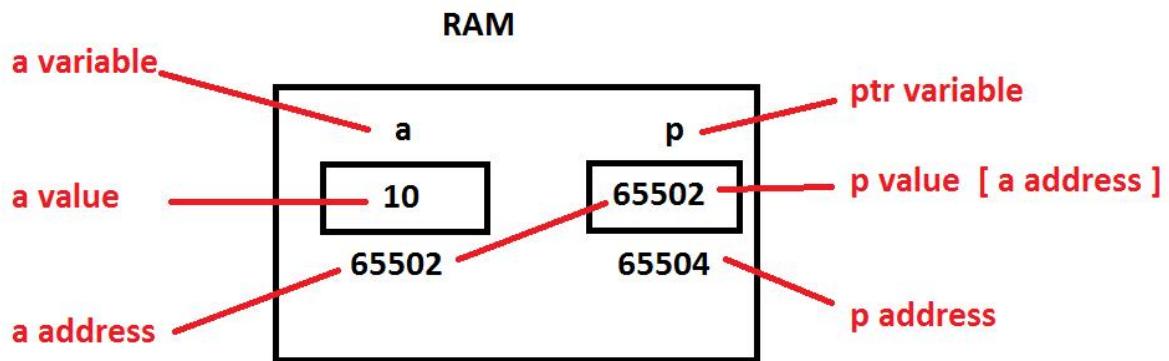
The screenshot shows a Microsoft Windows desktop environment. At the top, there is a taskbar with various pinned icons, including a calculator, a browser, and several application icons. The main focus is a terminal window titled "TC" which displays the following C code and its execution:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10; /* var */
int *p; /* pointer var */
p = &a;
clrscr();
printf("a value %d\n",a);
printf("a address %u\n",&a);
printf("p value %u",p);
getch();
}
```

The terminal output shows the variables and their values:

```
a value 10
a address 65502
p value 65502
```

The status bar at the bottom of the terminal window shows the date and time: "10:28 AM 19-Oct-24".



() and , separators:

TC

Error: Declaration syntax error in function main

```

File Edit Run Compile Project Options Debug Break/watch
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10,20; /* var declaration */
clrscr();
printf("a value %d\n",a);
getch();
}

```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:31 AM 19-Oct-24

The image displays three vertically stacked windows of Microsoft Visual Studio Code, each showing a different segment of C code. The windows are arranged side-by-side, sharing a common toolbar at the top and bottom.

Top Window:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=(10,20); /* var declaration */
clrscr();
printf("a value %d\n",a);
getch();
}
```

Middle Window:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a; /* var declaration */
clrscr();
a=10,20,30; /* initialization */
printf("a value %d\n",a);
getch();
}
/* a value 10
= have more priority than , operator _
```

Bottom Window:

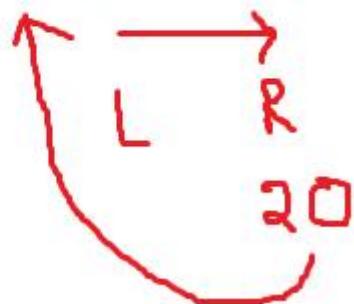
```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
```

The windows show the following details:

- Top Window:** Line 5, Col 14. Status bar: Line 5 Col 14 Insert Indent Tab Fill Unindent * E:9AM.C
- Middle Window:** Line 12, Col 38. Status bar: Line 12 Col 38 Insert Indent Tab Fill Unindent * E:9AM.C
- Bottom Window:** Line 1, Col 1. Status bar: F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

The windows also feature a standard Windows taskbar at the bottom with icons for File Explorer, Task View, Start, Taskbar settings, and system status.

```
int a = ( 10, 20 );
```



```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a; /* var declaration */
clrscr();
a=(10,20,30),40; /* initialization */
printf("a value %d\n",a);
getch();
}
/* a value 30 */
```

$a = (10, 20, 30), 40;$



$20, 30$



$a = 20, 30, 40$

```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 13 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a; /* var declaration */
clrscr();
a=10,20,(30),40; /* initialization */
printf("a value %d\n",a);
getch();
}
/* a value 10 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu | NUM

10:42 AM
19-Oct-24

$a = 10, 20, (30), 40;$



$a = 10, 20, 30, 40;$



A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar shows Line 11, Col 13, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a; /* var declaration */
    clrscr();
    a=(10,20),(30,40); /* initialization */
    printf("a value %d\n",a);
    getch();
}
/* a value 20 */
```

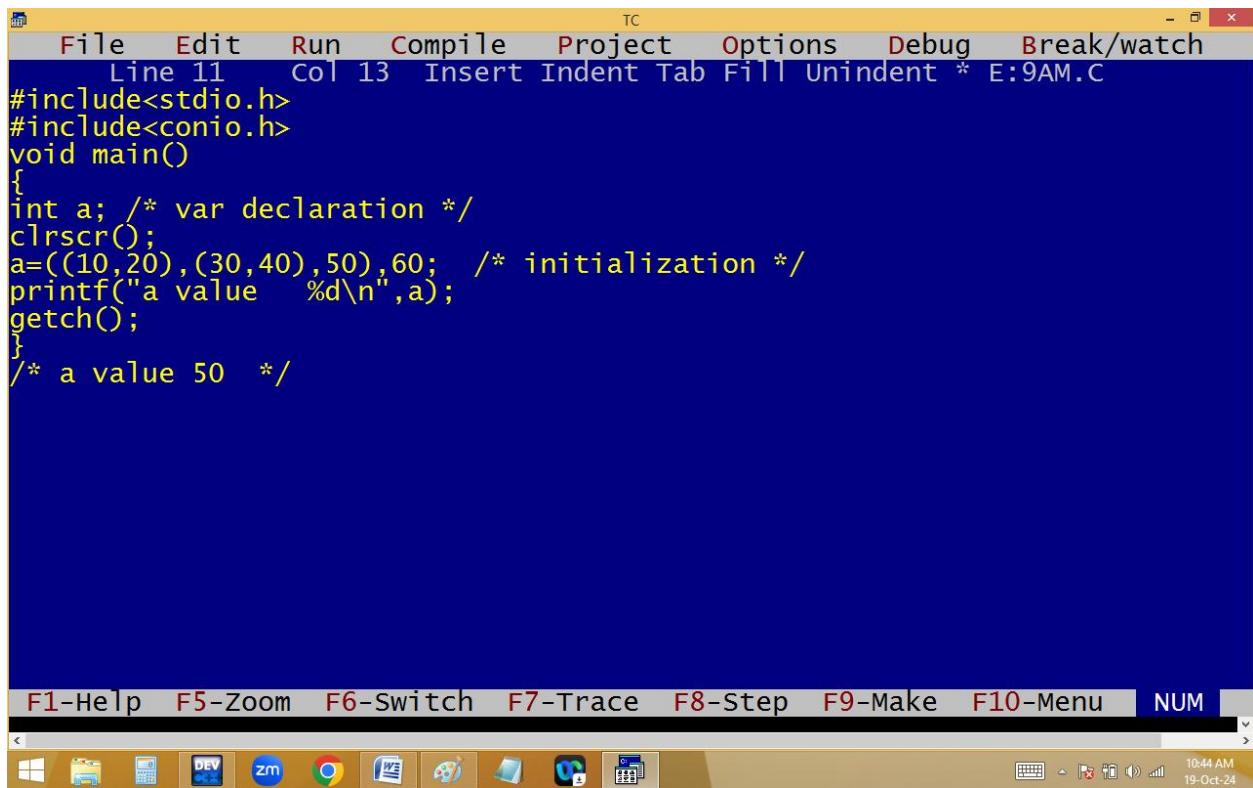
The F10-MENU key is highlighted. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:43 AM, 19-Oct-24.

a = (10, 20), (30, 40) ;
→ →
a = 20, 40

TC

```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 13 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a; /* var declaration */
clrscr();
a=((10,20),(30,40),50),60; /* initialization */
printf("a value %d\n",a);
getch();
}
/* a value 50 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM



$a = ((10,20), (30,40), 50), 60;$

$\overrightarrow{10} \overrightarrow{20} \rightarrow$
 $(20, 40, 50)$

$\overrightarrow{40, 50}$

$\overrightarrow{50, 60}$

$a = 50, 60$

Sizeof() operator: It return the no of bytes required for a variable / value / data type.

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 top indicates Line 18, Col 51, and the file name E:9AM.C. The code window contains a C program demonstrating the sizeof operator. The output window shows the results of the printf statements. The taskbar at the bottom has icons for various applications like Windows File Explorer, Task Manager, and a browser. The system tray shows the date and time as 9:38 AM, 21-Oct-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
float b;
char c;
clrscr();
printf("%d,%d,%d\n",sizeof(a),sizeof(b),sizeof(c));
printf("%d,%d,%d\n",sizeof(int),sizeof(float),sizeof(char));
printf("%d,%d,%d\n",sizeof(-5),sizeof(5),sizeof(32767));
printf("%d,%d\n",sizeof(32768),sizeof(50000));
printf("%d,%d\n",sizeof(65536),sizeof(500000));
printf("%d,%d\n",sizeof(32768u),sizeof(32768U));/* suffix type casting*/
printf("%d,%d\n",sizeof((unsigned)32768),sizeof((unsigned)65535));/*prefix*/
printf("%d,%d\n",sizeof(100000u),sizeof((unsigned)100000));
printf("%d,%d\n",sizeof((int)100000),sizeof((float)100));
printf("%d,%d\n",sizeof((char)100),sizeof((int)1.0));
getch();
}
/* After 32767 the default int is long int i.e. 4 bytes */
```

Output window content:

```
2,4,1
2,4,1
2,2,2
4,4
4,4
2,2
2,2
4,2
2,4
1,2
```

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the output of a C program. The program uses `printf` statements to print the sizes of various data types. The output is as follows:

```
4,8
8,10
4,4
10,10
2,2
```

The terminal window is titled "TC" and has a menu bar with options like File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows the date and time as 9:47 AM 21-Oct-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
float a=1.1;
double b=1.1;
char c;
clrscr();
printf("%d,%d\n",sizeof(a),sizeof(b));
printf("%d,%d\n",sizeof(1.1),sizeof(long double));
printf("%d,%d\n",sizeof(1.1f),sizeof((float)1.1));
printf("%d,%d\n",sizeof(1.1l),sizeof(1.1L));
printf("%d,%d\n",sizeof((int)1.1),sizeof((unsigned)1.1));
getch();
}
/* In c the default float is double i.e. 8 bytes */
```

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 top right shows Line 1, Col 1, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char a[10]="Kishore", b[]="Kishore";
    clrscr();
    printf("%d,%d\n", sizeof(a), sizeof(b));
    printf("%d,%d\n", sizeof("kishore"), sizeof("kishore\0"));
    printf("%d,%d\n", sizeof("kishore"), printf("kishore\0"));
    printf("%d,%d\n", sizeof(sizeof("kishore")), sizeof(sizeof("kishore+1")));
    printf("%d,%d\n", sizeof(sizeof("kishore")), sizeof("kishore+1"));
    printf("Kishore address is %u\n", "Kishore");
    printf("%d,%d\n", sizeof("kishore")+1, sizeof("kishore"+1));
    printf("%d\n", sizeof("kishore")>printf("kishore"));
    printf("%d, %d\n", sizeof(1.1.2), sizeof(1.2,1));
    printf("%d, %d\n", sizeof(1.1.2), sizeof(1.2,1));
    printf("%d, %d\n", sizeof(1+1.2), sizeof(1.2+1));
    getch();
}
/* Inside sizeof expressions not considered */
```

The output window displays the following results:

```
10,8
8,9
kishorekishore7,7
2,2
2,10
Kishore address is 515
9,2
kishore1
8, 2
8, 2
8, 8
```

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=999;
clrscr();
printf("%d, %d\n",sizeof("1.23"),sizeof(sizeof(1.2)));
printf("%d\n",sizeof(++a));
printf("%d\n",a);
printf("%d\n",sizeof(a=555));
printf("%d\n",a);
printf("%d",sizeof(sizeof()));
getch();
}
/* Inside sizeof expressions not considered */
```

The output of the program is displayed in the terminal window:

```
5, 2
2
999
2
999
9-
```

The desktop taskbar at the bottom shows several pinned icons, including File Explorer, Task View, Start, Task Manager, and others. The system tray in the bottom right corner shows the date and time as "10:34 AM 21-Oct-24".

A screenshot of the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message 'Error: Expression syntax in function main' is displayed above the code area. The code itself is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d",sizeof());
getch();
}
```

The status bar at the bottom shows keyboard shortcuts (F1-Help, F5-Zoom, etc.) and system information (NUM, 10:36 AM, 21-Oct-24).

BITWISE OPERATORS

Bitwise operator's works on bits.

Turbo-c is a 16 bit compiler. Due to this bitwise operations are limited to 16 bits only [2^0 to 2^{15}].

Bitwise operators operate **integer** type values only.

We have to calculate only the **on** bits [**1**].

When the first bit[Sign bit] is 1 then the number is Negative and it is 0 then the number is positive.

They are very much used in system software development.

Note: Bitwise operator is low level feature.

C-Language supports following bitwise operators.

& -Bitwise and

| - Bitwise or

^ - XOR ==> Exclusive OR

~ - Compliment operator

<< - Left shift operator

>> - Right shift operator

& - Bitwise and: In this both bits are 1's then result bit is 1. Otherwise result bit is 0.

Eg: 25 & 15 = 9

$$\begin{array}{r}
 25 = 0000 \ 0000 \ 0001 \ 1001 \\
 15 = 0000 \ 0000 \ 0000 \ 1111
 \end{array}
 \quad
 \begin{array}{r}
 2 | 25 \\
 2 | 12 - 1 \\
 2 | 6 - 0 \\
 2 | 3 - 0 \\
 \hline
 1 - 1
 \end{array}
 \quad
 \begin{array}{r}
 2 | 15 \\
 2 | 7 - 1 \\
 2 | 3 - 1 \\
 \hline
 1 - 1
 \end{array}$$

$$25 \& 15 = 9$$

$$25 = 0000 \ 0000 \ 0001 \ 1001$$

$$15 = 0000 \ 0000 \ 0000 \ 1111$$

&

$$\begin{array}{r}
 0000 \ 0000 \ 0000 \ 1001 \\
 \downarrow \quad \downarrow \\
 2^3 + 2^0 \\
 \downarrow \quad \downarrow \\
 8 + 1 = 9
 \end{array}$$

| - Bitwise or: In this both bits are 0's then result bit is 0. Otherwise result bit is 1.

$$\text{Eg: } 25 | 15 = 31$$

$$25 \mid 15 = 31$$

$25 = 0000 \quad 0000 \quad 0001 \quad 1001$

$15 = 0000 \quad 0000 \quad 0000 \quad 1111$

$$\begin{array}{r} & & 0001 & 1111 \\ & | & & & \\ \hline 0000 & 0000 & 0001 & 1111 \\ & & 2^4 + 2^3 + 2^2 + 2^1 + 2^0 \\ & & 16 + 8 + 4 + 2 + 1 = 31 \end{array}$$

\wedge - XOR [Exclusive OR]: In this both bits are same then result bit is 0. Otherwise result bit is 1.

$$\text{Eg: } 25 \wedge 15 = 22$$

$$25 \wedge 15 = 22$$

$25 = 0000 \ 0000 \ 0001 \ 1001$

$15 = 0000 \ 0000 \ 0000 \ 1111$

$$\begin{array}{r} 0000 \ 0000 \ 0001 \ 0110 \\ 2^4 + 2^2 + 2^1 \\ 16 + 4 + 2 = 22 \end{array}$$

\sim - Compliment operator: In compliment operation the bits are complimented. i.e.

1's become 0's and 0's become 1's. Due to this +Ve no becomes -Ve and -Ve no becomes +Ve.

eg: $\sim 25 \rightarrow -26$

$$25 = \begin{array}{r} 0000\ 0000\ 0001\ 1001 \\ 1111\ 1111\ 1110\ 0110 \end{array}$$

$\begin{array}{r} \cancel{1} \cancel{1} \cancel{1} \\ -128 + \cancel{64} + \cancel{32} + \cancel{4} + 2 = -26 \\ -128 + 102 = -26 \end{array}$

$$\begin{aligned} 25 &= 0000\ 0000\ 0001\ 1001 \\ \sim &= 1111\ 1111\ 1110\ 0110 \\ &\quad \begin{matrix} \cancel{1} & \cancel{1} \\ 5 & 21 \end{matrix} \end{aligned}$$

$$2+4+32+64+128+256+512+1024+2048+4096+8192+16384-32768=-26$$

$$\begin{aligned} \sim -25 &= 0000\ 0000\ 0001\ 1001 \\ 1's \sim &= 1111\ 1111\ 1110\ 0110 \\ 2's \sim &= 0000\ 0000\ 0000\ 0001 \\ &\quad \begin{matrix} \cancel{1} & \cancel{1} \\ 16 & 8 \end{matrix} \end{aligned}$$

$$\begin{array}{r} 1 \ 0 \ 0 \ \text{Q1} \\ 0 \ 1 \ 0 \ \text{1} \\ \underline{1 \ 1 \ 0} \ \underline{\text{10}} \end{array}$$

Note: When starting bit is 1 given no is -Ve.

Eg: $\sim -25 \rightarrow +24$

$$\sim -25 = +24$$

$25 = \boxed{0000\ 0000} \quad 0001\ 1001$
 $\quad \quad \boxed{1111\ 1111} \quad 1110\ 0110$
 $\quad \quad \quad +1$

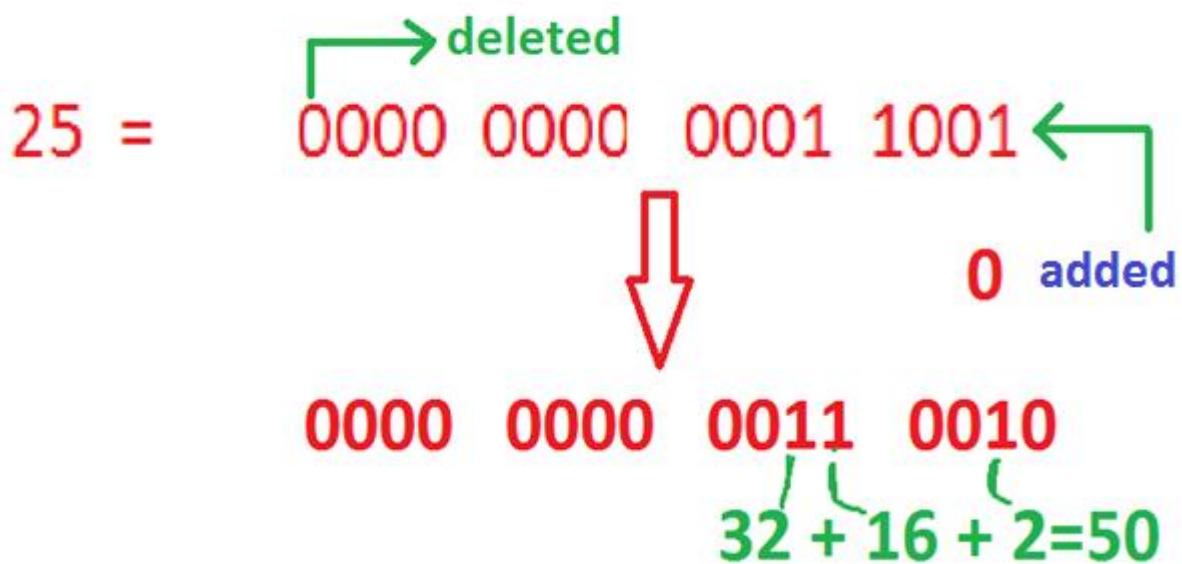

 1111 1111 1110 0111
 ~
 0000 0000 0001 1000
 ↓ ↓
 16+8=24

<< - left shift operator:

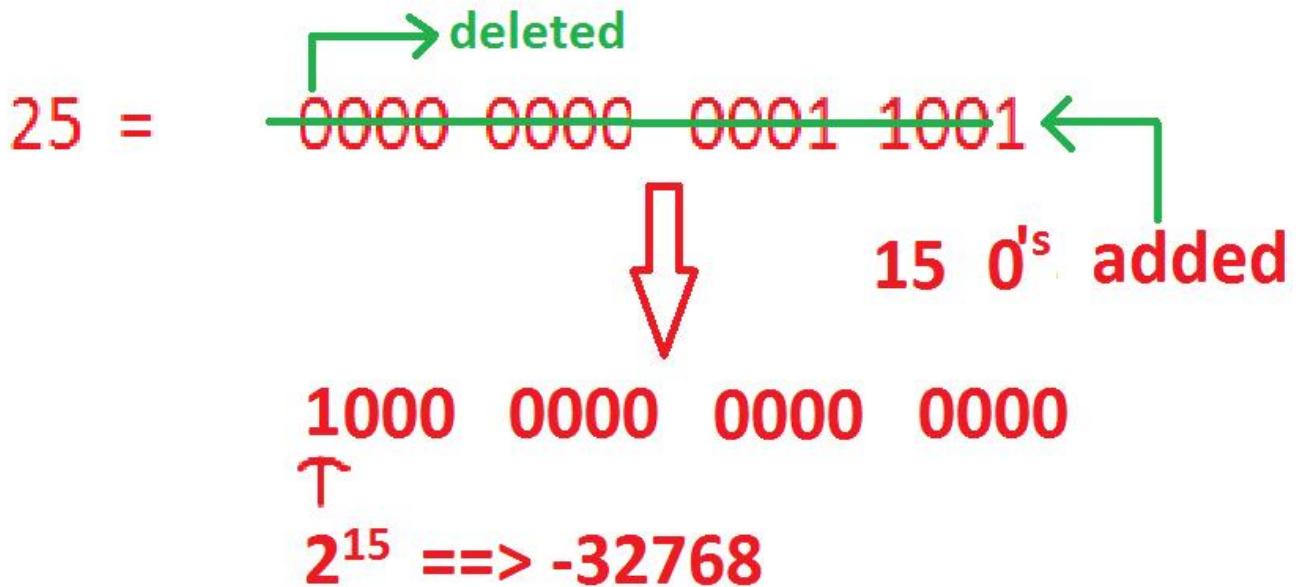
In left shift operation, the specified no of bits are deleted from left side and the same no of **zeros** added on right side. In left shift operation, most probably the value is multiplied with 2 that no of times.

Eg: $25 \ll 1 = 50$, $25 \ll 2 = 100$, $25 \ll 15 = -32768$,
 $25 \ll 16 = 0$

eg: $25 \ll 1 = 50$



eg: $25 \ll 15 = -32768$



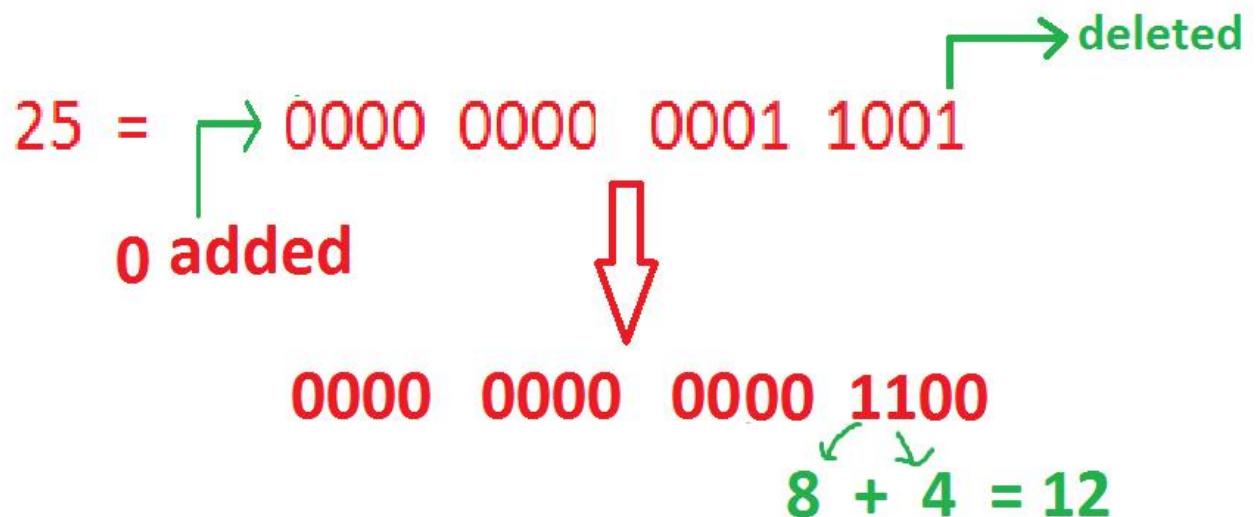
Note: When starting bit 1 no is negative.

>> - Right shift operator:

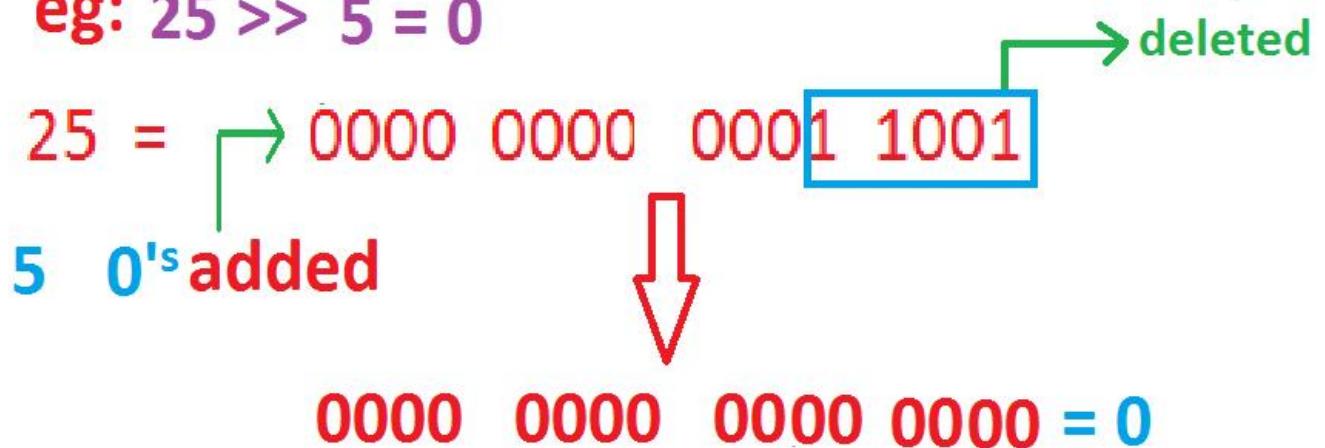
In right shift operation, the bits are moved to right side i.e. the specified no.of bits are deleted from right side and same no.of zero's are added left side. Due to this always the number is divided with 2 that no of times.

Eg: $25 >> 1 = 12$, $25 >> 2 = 6$, $25 >> 3 = 3$, $25 >> 4 = 1$, $25 >> 5 = 0$

eg: $25 >> 1 = 12$



eg: $25 >> 5 = 0$



C - PROGRAM STRUCTURE

It illustrates[Describes] how to write a program in c-language.

Every programming language is having a particular structure and we should have to follow this structure.

C-Programming structure is divided into the following parts.

- [documentation section]
- Header files / Proto types / Preprocessor
- [global variables]
- [function declarations & definitions]
- void main() / main() / int main()
- Other statements.

Generally documentation section consists of program headings, definitions etc and They should be represented with comments.

The statements that are enclosed in between /* and */ are called comments.

Comments never participate in program execution. They are only for user understandability or display purpose.

C-Language supports comment block only.

Eg:

```
/*
....;
....;
*/
```

C++ supports comment block and single line comments.

Eg: //

Header files consists of function definitions, global variables, macros etc.

We can declare the header files at any place of our program. But before going to use the relevant function, its header file should be declared. It is recommended to declare the header files at the top of the program.

Every header file should be started with **#include**. Here **#** is a **preprocessor** indicator.

We can place header files in angled brackets

< > or double quotes “ ”.

Header file never ends with **semicolon(;)**.

Note: In C++, we should have to declare header files at the top only.

The variables that are declared before main() or top of the program are called **global variables** and they can be accessed from anywhere in our program. They are optional.

Function declarations and definitions contain function header and body.

- * Every C-Program execution starts from main() function and travel towards down. Hence it is also called **top-down** approach.
- * Without main(), C-Program never executed but compiled.
- * main() is predefined function with user defined body. main() doesn't have any header file. One program have to maintain one main() only. **We can create alternate for main().** Other statements are changed from program to program.

Note: It is recommended to write C programs in lower case only. Every statement should have to end with semicolon main().

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 25 & 15);
printf("%d\n", 25|15);
printf("%d\n", 25^15);
printf("%d\n", ~25);
printf("%d\n", ~-25);
printf("%d\n", 25<<2);
printf("%d\n", 25<<15);
printf("%d\n", 25<<16);
printf("%d\n", 25>>2);
printf("%d\n", 25>>5);
printf("%d\n", -25<<2);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 25 & 15);
printf("%d\n", 25|15);
printf("%d\n", 25^15);
printf("%d\n", ~25);
printf("%d\n", ~-25);
printf("%d\n", 25<<2);
printf("%d\n", 25<<15);
printf("%d\n", 25<<16);
printf("%d\n", 25>>2);
printf("%d\n", 25>>5);
printf("%d\n", -25<<2);
getch();
}
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%d\n", 25 & 15);
printf("%d\n", 25|15);
printf("%d\n", 25^15);
printf("%d\n", ~25);
printf("%d\n", ~-25);
printf("%d\n", 25<<2);
printf("%d\n", 25<<15);
printf("%d\n", 25<<16);
printf("%d\n", 25>>2);
printf("%d\n", 25>>5);
printf("%d\n", -25<<2);
getch();
}
```

```
9  
31  
22  
-26  
24  
100  
-32768  
0  
6  
0  
-100
```



```
File Edit Run Compile Project Options Debug Break/watch  
Error: Illegal use of floating point in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
printf("%d\n", 25<<2.0);  
getch();  
}
```



```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
```

The screenshot shows a Microsoft Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the output of a C program. The program uses bit manipulation operators (<< and >>) to shift the value of variable 'a' (initially 10) through various states: 10, 80, 20, 160, and finally 160_. The terminal window also shows the command prompt and the Turbo C++ IDE interface.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10;
clrscr();
a<<2;
a>>3;
printf("a=%d\n",a);
printf("%d\n",a<<3);
printf("a=%d\n",a);
printf("%d\n",a<<2+1>>2);
printf("a=%d\n",a);
a=a<<2+1>>2;
printf("a=%d\n",a);
printf("%d\n",a<<=3); /* a=a<<3; */
printf("a=%d",a);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

```
a=10
80
a=10
20
a=10
a=20
160
a=160_
```

printf():

It is the major output function in c.

It is a predefined function available in stdio.h

**It always refers standard output device. i.e.
monitor.**

In printf, f means formatted.

Syntax:

```
int printf(" [text] [ conversion characters /  
format specifiers / format strings ] " [ ,  
variables ] [ , expressions ] );
```

Note:

- 1. Printf always return int that indicates the no of printable characters on the screen.**
- 2. In printf the first argument should be in “ ”.**

3. **Printf can perform both formatted and unformatted outputs.**
4. **In printf everything printed as it is except conversion characters and back slash characters.**
5. **In printf execution order is right to left and printing is left to right.**

Eg. Write a c program to find string length without using loop / strlen()

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int c;
clrscr();
c = printf("Kishore");
printf("\tLength=%d\n",c);
printf("\tLength=%d",printf("Kishore"));
getch();
}
```

The terminal output shows two lines of text: "Kishore Length=7" and "Kishore Length=7". The window title bar indicates the application is "TC". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows the date and time as 10:07 AM 22-Oct-24.

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window is titled "TC" and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10;
float b=1.2;
clrscr();
printf("Hi\n"); /* unformatted */
printf("a=%d\n");
printf("a=%d\n",a); /* formatted */
printf("b=%f\n",b);
printf("a=%d, b=%f\n",a,b);
printf("Sum=%f\n",a+b);
printf("a=%d, b=%f, sum=%f\n",a,b,a+b);
printf("%d + %f=%f\n",a,b,a+b);
printf("%d",a);
getch();
}
```

The terminal output shows the execution of the program:

```
Hi
a=
a=10
b=1.200000
a=10, b=1.200000
Sum=11.200000
a=10, b=1.200000, Sum=11.200000
10 + 1.200000=11.200000
10_
```

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window Help

[] 9AM.CPP

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Hi\n");
printf("Bye");
getch();
}
```

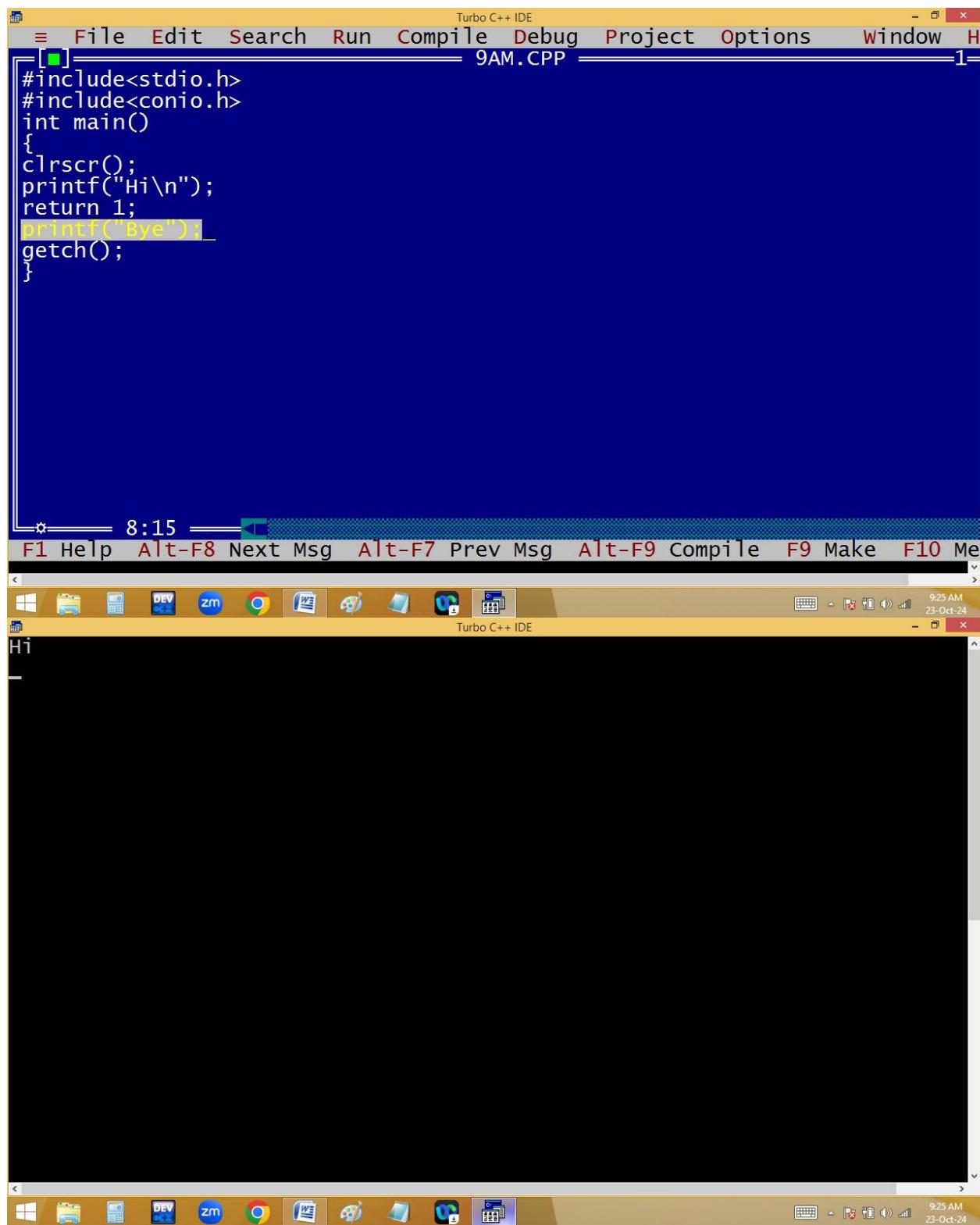
8:9

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Windows Taskbar: File Explorer, Control Panel, DEV, zm, Google Chrome, Paint, Notepad, Turbo C++ IDE, Keyboard, Mouse, Network, Sound, Date/Time: 9:22 AM, 23-Oct-24

Output window:
Hi
Bye

Windows Taskbar: File Explorer, Control Panel, DEV, zm, Google Chrome, Paint, Notepad, Turbo C++ IDE, Keyboard, Mouse, Network, Sound, Date/Time: 9:22 AM, 23-Oct-24



Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Hi\n");
return 'x';
printf("Bye");
getch();
}
```

Error 9AM.CPP 7: 'main()' cannot return a value
7:12

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Hi\n");
return;
printf("Bye");
getch();
}
```

7:7

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Hi\n");
return 0;
printf("Bye");
getch();
}
```

9:28 AM
23-Oct-24

Turbo C++ IDE

Hi

File Edit Search Run Compile Debug Project Options Window H 9AM.CPP 1

```
#include<stdio.h>
#include<conio.h>
int main()
{
clrscr();
printf("Hi\n");
printf("Bye");
getch();
```

[] Message 2

Compiling 9AM.CPP:

•Warning 9AM.CPP 9: Function should return a value

F1 Help Space View source ← Edit source F10 Menu

Windows Taskbar: DEV, zm, Google Chrome, File Explorer, Paint, Notepad, Turbo C++ IDE, Task View, Taskbar icons, Date/Time: 9:30 AM, 23-Oct-24

Turbo C++ IDE

Hi
Bye_

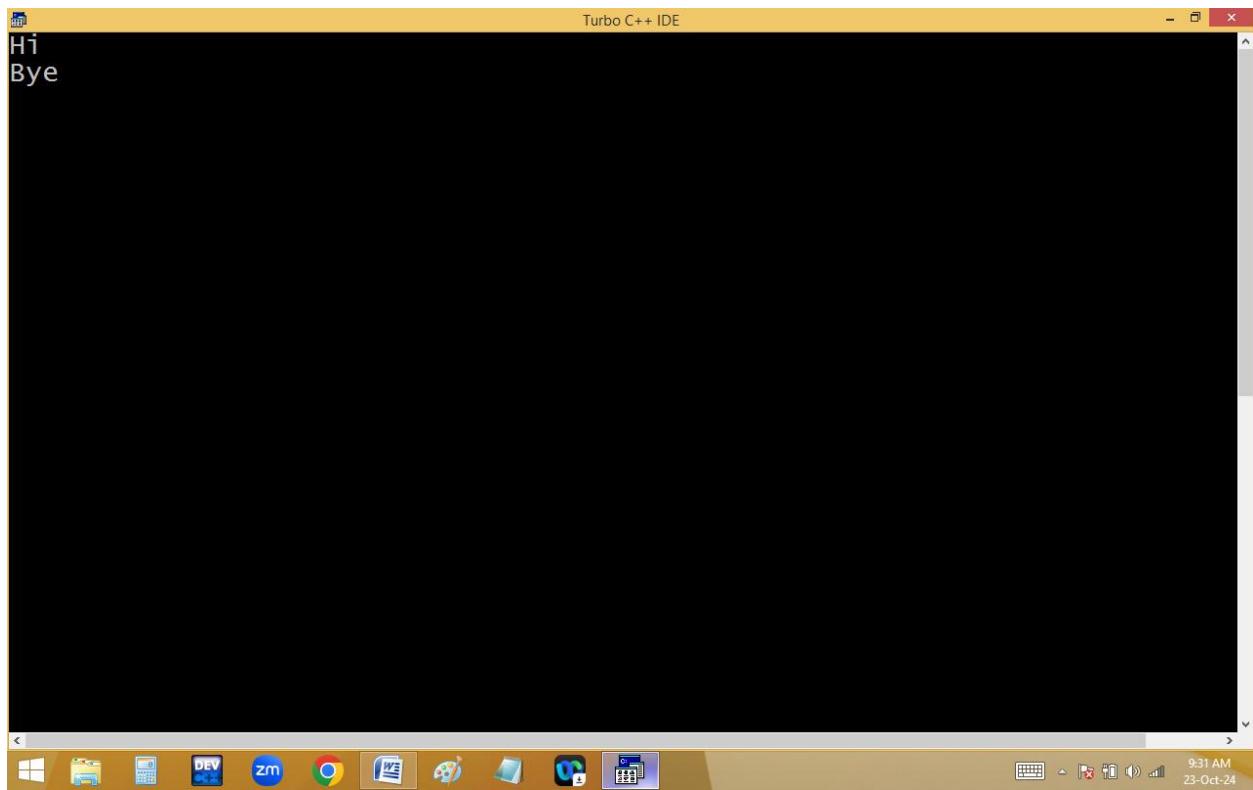
File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
main()
{
clrscr();
printf("Hi\n");
printf("Bye");
getch();
}
```

Warning 9AM.CPP 9: Function should return a value

9:2 F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Windows taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Microsoft Edge, and others.



Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
void show() // user defined function
{
    printf("Hello");
}
```

Compiling

Main file: 9AM.CPP
Compiling: EDITOR → 9AM.CPP

	Total	File
Lines compiled:	467	467
Warnings:	0	0
Errors:	0	0

Available memory: 1978K

Success : Press any key

7:1

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
#include<conio.h>
void show() // user defined function
{
    printf("Hello");
}
```

Message

Linking 9AM.EXE:
•Linker Error: Undefined symbol _main in module c0.ASM

F1 Help F10 Menu

Windows Taskbar

A screenshot of a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window contains the following text:

```
Line 2    Col 54  Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#define kishore  main /* macro substitution text */
void kishore()
{
clrscr();
printf("HI");
}
```

The terminal window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. Below the menu is a status bar showing "Line 2" and "Col 54". A toolbar below the status bar includes icons for Help, Zoom, Switch, Trace, Step, Make, and Menu, along with F1-F10 key mappings. The system tray at the bottom shows various icons and the date/time: "9:50 AM 23-Oct-24".

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
void main() // user defined function
{
printf("Hello");
}
void main()
{
printf("Bye");
}
```

Error 9AM.CPP 7: Body has already been defined for function 'main()' 7:2

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

Turbo C++ IDE

File Edit Search Run Compile Debug Project Options Window H
9AM.CPP 1=

```
#include<stdio.h>
void main() // user defined function
{
printf("Hello")
```

Error 9AM.CPP 5: Statement missing ; 5:2

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

9:53 AM 23-Oct-24

Windows taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Control Panel, Task View, Start button.

9:54 AM 23-Oct-24

```
#include<stdio.h>
void main(); // user defined function
{
printf("Hello");
}
```

Error 9AM.CPP 3: Declaration terminated incorrectly

F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Me

```
#include<stdio.h>
void main() // user defined function
{
    printf("Hello");
}
```

[] ————— Message ————— 2 =

Compiling 9AM.CPP:
Error 9AM.CPP 4: Function 'printf' should have a prototype

F1 Help Space View source ← Edit source F10 Menu

The image shows the Windows taskbar at the bottom of a screen. It features several pinned icons on the left, including File Explorer, Task View, File History, Control Panel, and a folder icon. To the right of these are icons for Microsoft Edge, OneDrive, and a few other applications. On the far right, there's a system tray with icons for battery level, signal strength, volume, and a small clock showing 9:56 AM.

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The status bar at the top indicates Line 5, Col 16, Insert, Indent, Tab, Fill, Unindent, * E:NONAME.C. The code editor contains the following C program:

```
#include<stdio.h>
void main()
{
printf("Kishore Naidu\n");
printf("Vizag\n");
printf("Andhra Pradesh");
```

The output window below the editor displays the printed text:

```
Kishore Naidu
Vizag
Andhra Pradesh
```

The system tray at the bottom shows various icons and the date/time: 9:59 AM 23-Oct-24.

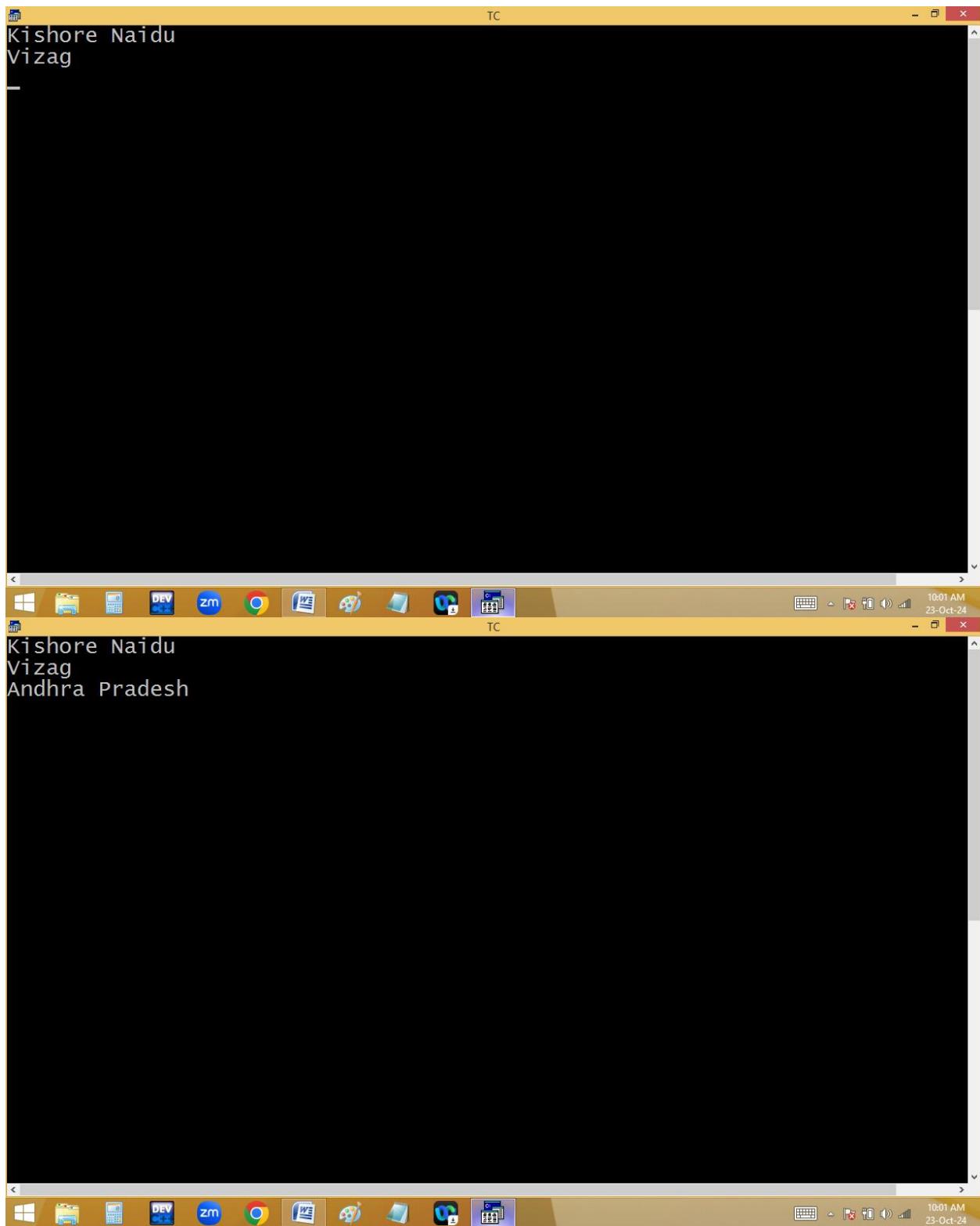
The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The main code editor window displays the following C code:

```
Line 2      col 18  Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
    printf("Kishore Naidu\n");
    getch();
    printf("Vizag\n");
    getch();
    printf("Andhra Pradesh");
    getch();
}
```

The output window below shows the printed text:

```
Kishore Naidu
Vizag
Andhra Pradesh
```

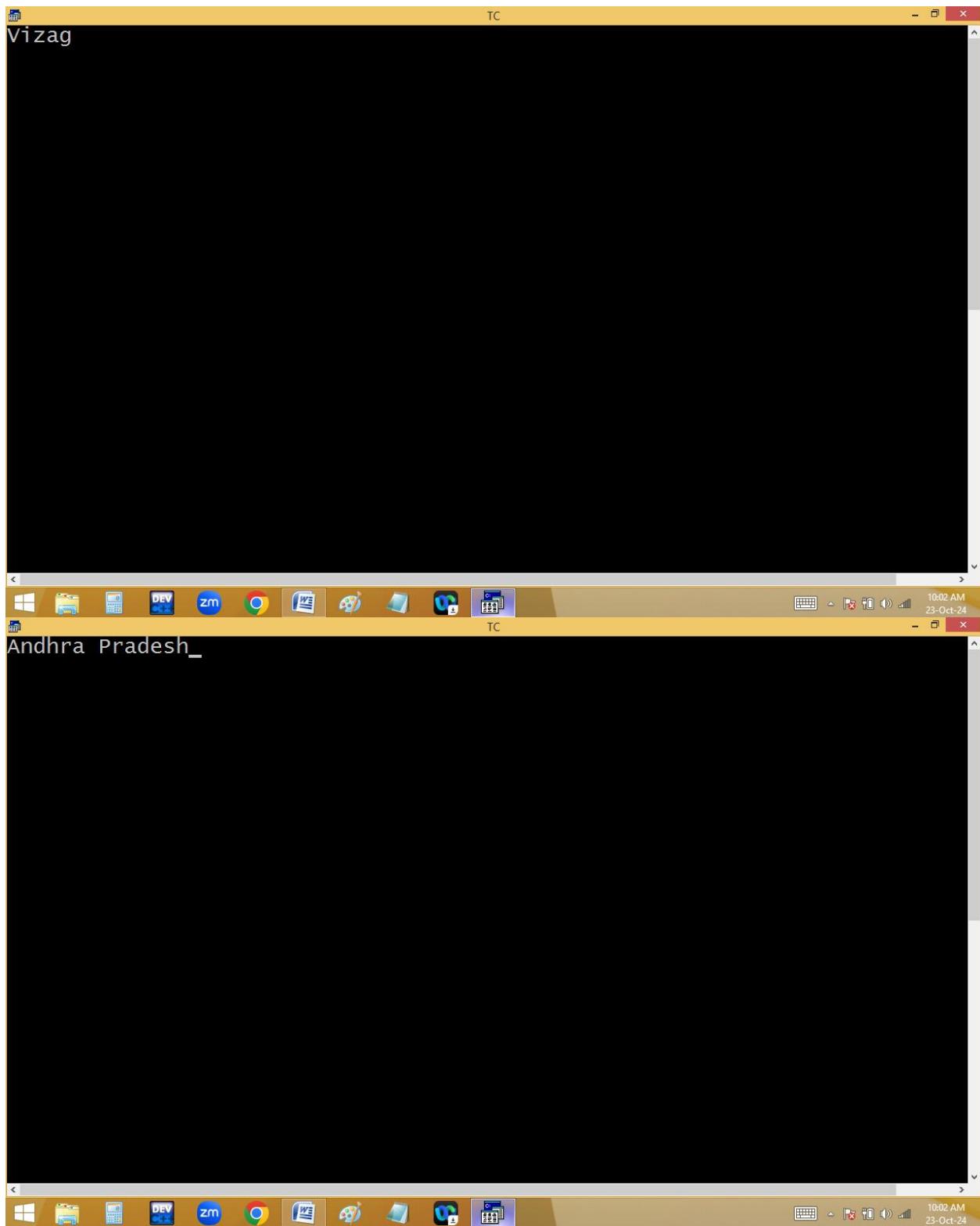
The status bar at the bottom indicates the time as 10:01 AM and the date as 23-Oct-24.



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The main window displays the following C code:

```
Line 10  col 10  Insert Indent Tab Fill Unindent * E:NONAME.C
#include<stdio.h>
#include<conio.h>
void main()
{
printf("Kishore Naidu\n");
getch();
clrscr();
printf("Vizag\n");
getch();
clrscr();
printf("Andhra Pradesh");
getch();
}
```

The status bar at the bottom indicates "Watch". Below the main window, the taskbar shows various application icons, and the system tray shows the date and time as "10:02 AM 23-Oct-24".



```
#include<stdio.h>
```

```
#include<conio.h>
```

```

#include<stdlib.h>

main()
{
    printf("Hi");

    getch();

    system("cls");

    printf("Hello");

    getch();

}

```

BACK SLASH / ESCAPE SEQUENCE CHARACTERS

They started with back slash [\].

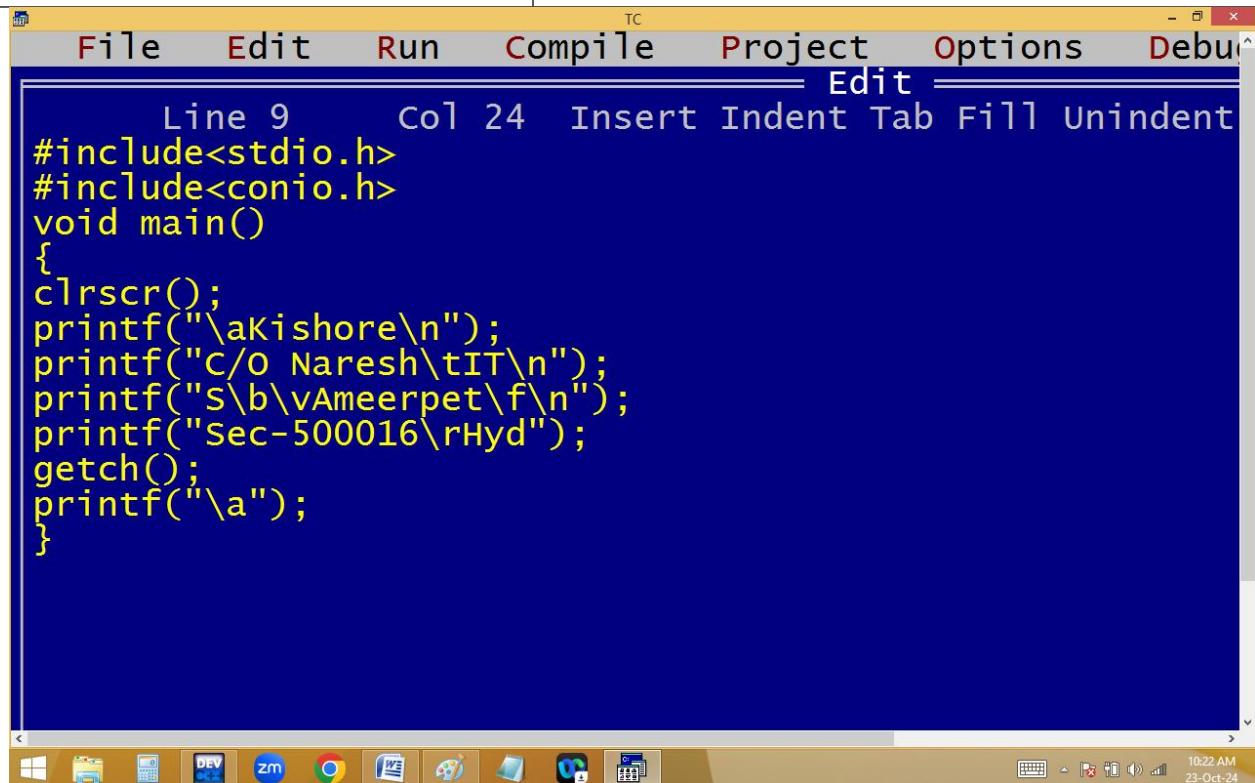
They used to format the outputs.

They participated in program execution but not displayed in output. Hence they are also called **escape sequence characters**.

Each back slash character=**1 byte i.e. one character**.

BACK SLASH CHARACTER	DESCRIPTION
\a	Alert [beep sound]
\b	Back space
\n	New line character

\t	Tab space
\r	Carriage return[beginning of line]
\f	Form feed ♀
\v	Vertical tab ♂
\0	Null char
\\\	\ [invalid]
\k	k [invalid]



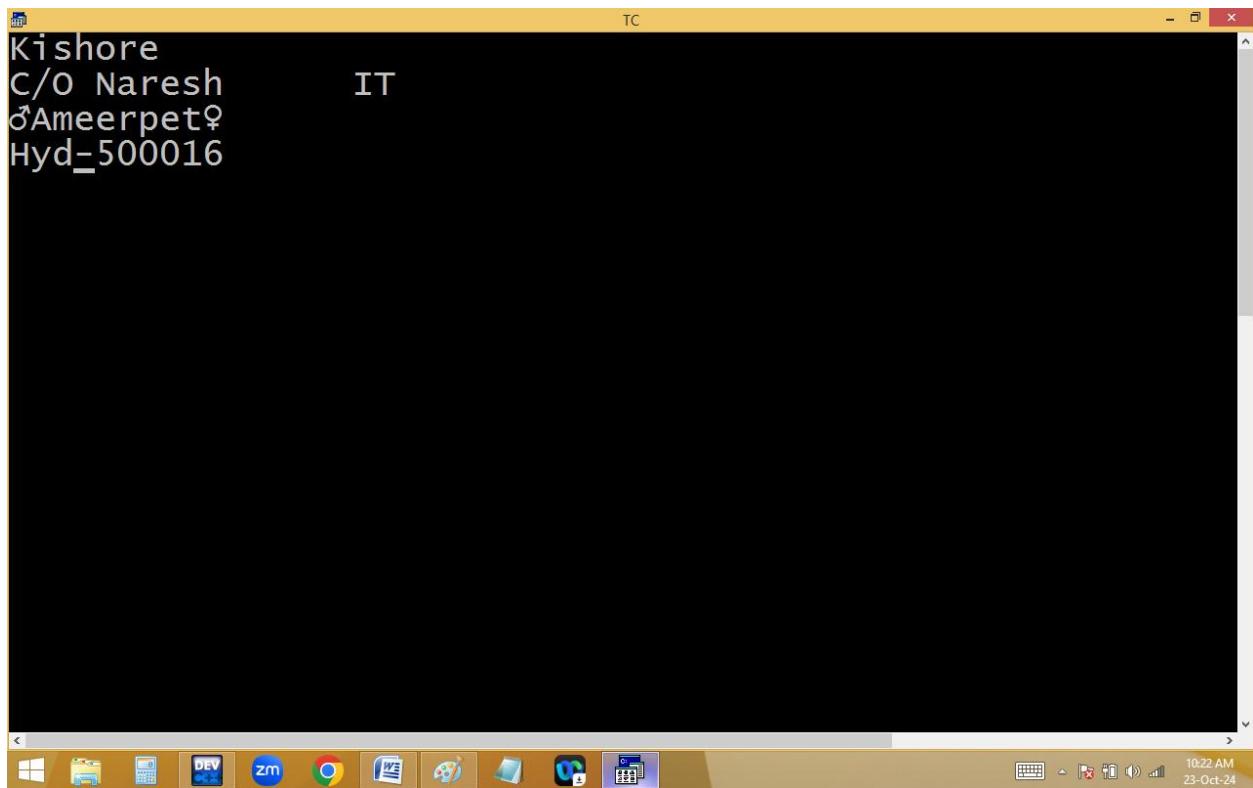
The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and a separator line followed by Edit. The status bar at the bottom indicates Line 9, Col 24, Insert, Indent, Tab, Fill, and Unindent. The code editor displays the following C program:

```

Line 9      col 24  Insert Indent Tab Fill Unindent
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("\aKishore\n");
    printf("c/o Naresh\tIT\n");
    printf("s\b\vAmeerpet\f\n");
    printf("Sec-500016\rHyd");
    getch();
    printf("\a");
}

```

The IDE's toolbar at the bottom contains icons for various functions like Open, Save, Print, and Build.



A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The code editor shows a C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("Naresh\\tIT\\nHyd");
    getch();
}
```

The status bar at the bottom indicates Line 8, Col 1, and the current time is 10:24 AM on 23-Oct-24.

p("Naresh\\tIT\\nHyd");

The output of the printf statement is shown below, with two red arrows pointing from the 'x' marks in the original code to the backslashes in the displayed string. The output is:

Naresh\tIT\nHyd

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The status bar shows Line 11, Col 1, Insert, Indent, Tab, Fill, and Unindent. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("Naresh\\tIT\\nHyd");
    getch();
}
/* Naresh\      IT\
   Hyd          */

```

The output window shows the printed text: "Naresh\ tIT\nHyd". The carriage return and tab characters are highlighted with red arrows pointing to the backslash and 't' respectively.

p("Naresh\\\tIT\\\nHyd");

The printed output is shown below the code. The string "Naresh\" is followed by a tab character (indicated by a red arrow), then "IT\", and finally a new line character (indicated by a red arrow) followed by "Hyd". A long red arrow points from the closing brace of the printf call in the code up to the new line character in the output.

TC

File Edit Run Compile Project Options Debug

Line 13 Col 23 Insert Indent Tab Fill Unindent

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("12%c34%c56",9,10);
getch();
}
/* 12    34
   56

   9 - \t ascii value
  10 - \n ascii value_
*/
```

p("12%c34%c56",9,10);

The diagram illustrates the mapping of escape sequences to their corresponding ASCII values. It shows the string "12%c34%c56",9,10); with various parts highlighted in blue and purple. Hand-drawn green arrows point from each highlighted part to its corresponding ASCII value below it:

- A green arrow points from the character '1' to the value '9', labeled as '\t ascii value'.
- A green arrow points from the character '2' to the value '10', labeled as '\n ascii value_'. This indicates that the character '2' is interpreted as a carriage return (CR) and the character '3' is interpreted as a line feed (LF).
- A green arrow points from the character '5' to the value '12', labeled as '\t ascii value'.
- A green arrow points from the character '6' to the value '13', labeled as '\n ascii value'.

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The main window shows the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("\"KISHORE\\"");
    getch();
}
```

The status bar at the bottom indicates Line 6, Col 19, and the current time is 10:36 AM on 23-Oct-24.

p("\"Kishore\"");

The screenshot shows a Windows operating system interface. At the top is the taskbar with various icons. Above the taskbar are two windows. The top window is titled "TC" and is a text editor. Its menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Edit. The main area displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("%cKISHORE%c", 34, 34);
    getch();
}
```

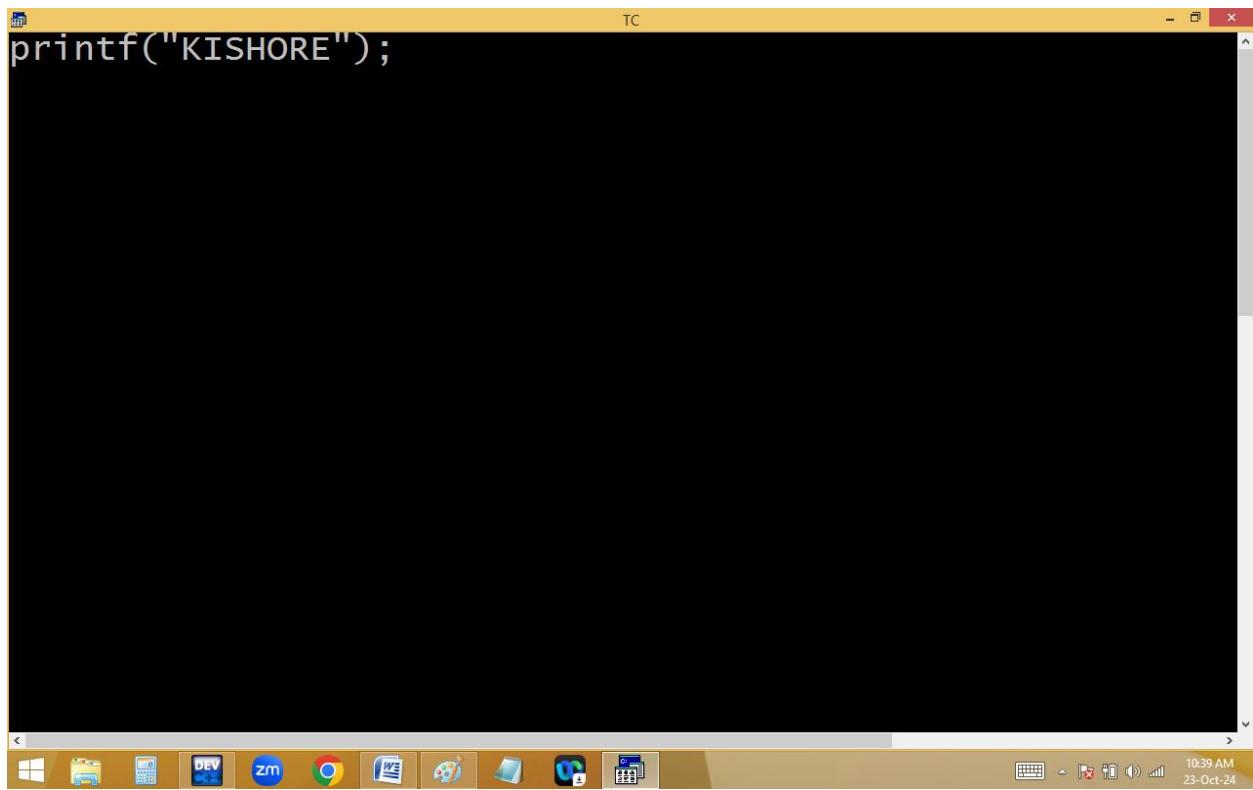
The bottom window is also titled "TC" and is a terminal or command prompt. It shows the output of the program's execution: the text "KISHORE" followed by a blank line.

This screenshot is identical to the one above it, showing the same Windows desktop environment, the same two windows (text editor and terminal), and the same C code and its output. The terminal window shows "KISHORE" on a new line.

A screenshot of the Microsoft Visual Studio Code interface. The window title is "TC". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and a separator line followed by Edit, Insert, Indent, Tab, Fill, and Unindent. The status bar at the bottom shows "Line 6 Col 1" and the date/time "23-Oct-24 10:39 AM". The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("printf(\"KISHORE\");");
    getch();
}
```

```
printf("KISHORE");
```



p("printf(\"Kishore\");");

A screenshot of a Windows operating system desktop. At the top is the taskbar with various pinned icons. Below the taskbar are two windows: a code editor window titled "TC" and a terminal window titled "TC".

The code editor window (top) has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, and Edit. It displays the following C code:

```
Line 6      Col 14  Insert Indent Tab Fill Unindent
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("Krish_%c Radha", 3);
    getch();
}
```

The terminal window (bottom) shows the output of the program: "Krish ♥ Radha".

A screenshot of a Windows operating system desktop. At the top is the taskbar with various pinned icons. Below the taskbar is a terminal window titled "TC" which displays the output of the previously run C program: "Krish ♥ Radha".

TC

File Edit Run Compile Project Options Debug

Line 6 Col 27 Insert Indent Tab Fill Unindent

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%c + %c = %c",1,2,_3);
getch();
}
```

Page: 26 of 26 | Words: 101 |

130% 10:43 AM 23-Oct-24



TC

☺ + ☺ = ❤



In c:

Line 6 Col 12 Insert Indent Tab Fill Unindent

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int c=3,d=4;
    clrscr();
    printf("%c + %c = %c\n", '1','2','3');
    printf("%d + %d = %d\n", '1','2','3');
    printf("%d + %d = %d\n", 'a','b','c');
    printf("%c + %c = %c\n", 100, 122,102);
    printf("%d + %d = %d\n", 1,2);
    getch();
}
```

```
1 + 2 = 3
49 + 50 = 51
97 + 98 = 67
d + z = f
1 + 2 = 3
```

In C++:

The screenshot shows a window titled "Turbo C++ IDE" with a menu bar containing File, Edit, Search, Run, Compile, Debug, Project, and Options. The main area displays a C++ program named "9AM.CPP". The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int c=3, d=4;
    clrscr();
    printf("%d + %d = %d", 1,2);
    getch();
}
```

The window has a dark blue background and a light blue header bar. The status bar at the bottom right shows the time as 10:51 AM and the date as 23-Oct-24.

Turbo C++ IDE

```
1 + 2 = 4
```

This screenshot shows the Turbo C++ IDE interface. The title bar reads "Turbo C++ IDE". The main window is dark, and the output of the program "1 + 2 = 4" is displayed in white text at the top left. The system tray at the bottom shows various icons and the date/time "23-Oct-24 10:52 AM".

TC

File Edit Run Compile Project Options Debug

Line 11 Col 13 Insert Indent Tab Fill Unindent

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("%d + %d = %d\n", 1,2);
    printf("%s + %s = %s\n");
    printf("%c + %c = %c\n");
    printf("%d + %d = %d\n",1,2,3 );
    printf("%d % %d = %d\n",5,2,5%2 );
    printf("%d % %d = %d\n",5,2,5%2 );
    getch();
}
```

This screenshot shows the Turbo C++ IDE interface with a blue-themed code editor. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Edit". The code editor displays a C program with syntax highlighting. The status bar at the bottom indicates "Line 11 Col 13". The system tray at the bottom shows various icons and the date/time "23-Oct-24 10:57 AM".

```
TC
1 + 2 = -22
+ =
Ω + ↴ = ⊖
%d + %d = %d
5 % %d = %d
5 % 2 = 1
-
```



Windows taskbar icons include: File Explorer, File Manager, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, Snipping Tool, File History, and Task Scheduler.

System tray icons: Keyboard, Mouse, Battery, Signal strength, Volume, and Date/Time (10:57 AM, 23-Oct-24).

Finding even/odd without using if..else / ternary operator:

The screenshot shows a Windows desktop environment with two windows open. The top window is a Turbo C++ IDE (TC) showing a C program to determine if a number is even or odd. The bottom window is a terminal window displaying the execution of the program.

Turbo C++ IDE (Top Window):

```
Line 9      Col 23  Insert Indent Tab Fill Unindent
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    clrscr();
    printf("Enter a no "); scanf("%d",&n);
    n%2==0 && printf("even");
    n%2!=0 && printf("odd");
    getch();
}
```

Terminal Window (Bottom Window):

```
Enter a no 4
even
```

The terminal output shows that when the user enters the number 4, the program correctly identifies it as "even".

The image shows a Microsoft Windows desktop environment. At the top, there is a taskbar with various icons including a calculator, a browser, and some system utilities. In the center, there is a terminal window titled "TC" with a black background. The terminal displays the following text:

```
Enter a no 5
odd_
```

Below the terminal is a code editor window also titled "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Edit". The "Edit" menu is currently selected. The status bar at the bottom of the code editor shows "Line 8 Col 26 Insert Indent Tab Fill Unindent". The code in the editor is:#include<stdio.h>
#include<conio.h>
void main()
{
 int n;
 clrscr();
 printf("Enter a no "); scanf("%d",&n);
 n%2==0 && printf("even") || printf("odd");
 getch();
}

```
TC
Enter a no 8
even_
Enter a no 9
odd
```

The image shows a Windows operating system desktop with three separate terminal windows open. The windows are arranged vertically. The top window has a yellow title bar labeled 'TC'. It contains the text 'Enter a no 8' on the first line and 'even_' on the second line. The middle window has a blue title bar labeled 'TC'. It contains the text 'Enter a no 9' on the first line and 'odd' on the second line. The bottom window has a red title bar labeled 'TC'. This window is mostly blank, with only a few small, illegible characters visible near the bottom. At the very bottom of the screen is the Windows taskbar, which includes the Start button, pinned icons for various applications like File Explorer, Control Panel, and Device Manager, and the date and time '24-Oct-24'.

Finding max in 2 no's without using if..else / ternary op:

The screenshot shows a Windows desktop environment with two windows open. The top window is a Turbo C++ IDE (TC) showing a C program. The bottom window is a terminal window displaying the program's output.

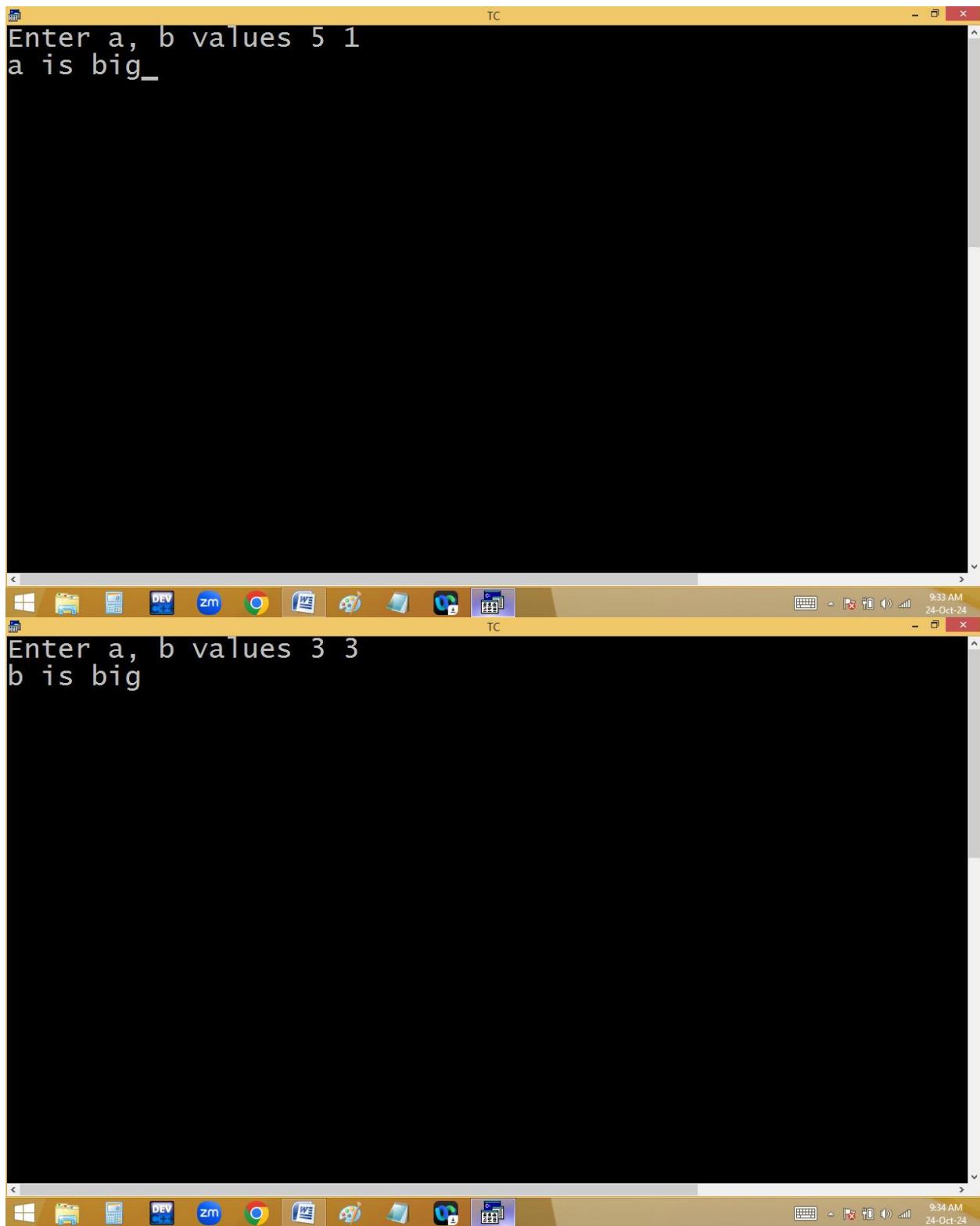
Turbo C++ IDE (Top Window):

```
File Edit Run Compile Project Options Debug TC
Line 8 Col 46 Insert Indent Tab Fill Unindent
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b;
    clrscr();
    printf("Enter a, b values ");
    scanf("%d%d",&a,&b);
    a>b && printf("a is big") || printf("b is big");
    getch();
}
```

Terminal Window (Bottom Window):

```
Enter a, b values 2 3
b is big_
```

```
TC
Enter a, b values 5 1
a is big_
Enter a, b values 3 3
b is big
```



TC

File Edit Run Compile Project Options Debug Break/watch
Edit

Line 8 Col 6 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a, b values ");
scanf("%d%d",&a,&b);
a>b&&printf("a is big")||b>a&&printf("b is big")||printf("Both are equal");
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows Start button DEV zm Google Paint Notepad File Explorer Task View Taskbar 9:36 AM 24-Oct-24

Enter a, b values 3 3
Both are equal

Windows Start button DEV zm Google Paint Notepad File Explorer Task View Taskbar 9:36 AM 24-Oct-24

Rounding of no:

Read a no and if the last digit is ≥ 5 go for next multiple of previous no, otherwise go for previous multiple.

Eg: 27 last digit is 7, above 5 then $\rightarrow 2+1=3*10=30$

23 last digit is 3, below 5 then $\rightarrow 2*10=20$

TC

File Edit Run Compile Project Options Debug Break/watch

Line 8 Col 52 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter n value ");
scanf("%d",&n);
n%10>=5&&printf("%d", (n/10+1)*10)||printf("%d", n/10*10);
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows Taskbar icons: DEV, zm, Chrome, File Explorer, Paint, Word, Excel, Powerpoint, Pictures, Control Panel, Task View, Start button.

System tray: Keyboard, Mouse, Network, Battery, Volume, Date/Time (9:46 AM, 24-Oct-24).

Text in terminal window:

```
Enter n value 27
30_
```

```
TC
Enter n value 23
20

Enter n value 12345
12350
```

```
TC
Enter n value 12344
12340_
```

$$23 \% 10 = 3 >= 5 \quad \text{---} \quad 23/10=2*10=20$$
$$27 \% 10 = 7 >= 5 \quad \&& \quad 27/10=\underline{2}+1=3*10=30 \quad || \quad 27/10=2*10=20$$

Finding cube value:

TC

File Edit Run Compile Project Options Debug Break/watch

Line 9 Col 33 Insert Indent Tab Fill Unindent * E:9AM.C

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

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

9:49 AM
24-Oct-24

Windows Taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Word, Excel, Powerpoint, Pictures, Control Panel, Task View, Task Manager, Task Scheduler, Task Sequence Editor.

Enter n value 10
10 cube = 1000

TC

```
Enter n value 100
100 cube = 16960_
```

File Edit Run Compile Project Options Debug Break/watch

Line 9 Col 48 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    long int cube;
    clrscr();
    printf("Enter n value "); scanf("%d",&n);
    cube = (long)n*n*n; /* explicit type casting */
    printf("%d cube = %ld", n, cube);
    getch();
}
```

- Watch -

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows Taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Notepad, Control Panel, Task View, Task Manager.

System tray: Keyboard, Mouse, Battery, Signal strength, Volume, Date/Time (9:52 AM, 24-Oct-24).

```
TC
Enter n value 100
100 cube = 1000000
```

```
Line 7 Col 36 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
long int n, cube;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
cube = n*n*n;
printf("%ld cube = %ld", n, cube);
getch();
}
```

- watch

F1-Help **F5**-Zoom **F6**-Switch **F7**-Trace **F8**-Step **F9**-Make **F10**-Menu

Enter n value 100
100 cube = 1000000_

```
Line 8 Col 67 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter n value."); scanf("%ld",&n);
printf("%d cube = %ld", n, (long)n*n*n);/* explicit type casting*/
getch();
}
```

- Watch

F1-Help **F5-Zoom** **F6-Switch** **F7-Trace** **F8-Step** **F9-Make** **F10-Menu**

Enter n value 100
100 cube = 1000000

Finding power value:

$$2^5=32$$

TC

File Edit Run Compile Project Options Debug Break/watch

Line 3 Col 17 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int b,p;
clrscr();
printf("Enter base, power values ");
scanf("%d %d", &b, &p);
printf("%d ^ %d = %d", b, p, pow(b, p));
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows taskbar icons: DEV, zm, Chrome, File Explorer, Paint, Word, Excel, Powerpoint, Task View, Task Manager.

System tray: Keyboard, Mouse, Battery, Signal strength, 9:59 AM, 24-Oct-24.

Text in window: Enter base, power values 2 5
2 ^ 5 = 0

TC

File Edit Run Compile Project Options Debug Break/watch

Line 11 Col 70 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int b,p;
clrscr();
printf("Enter base, power values ");
scanf("%d %d", &b, &p);
printf("%d ^ %d = %f\n", b, p, pow(b, p));
printf("%d ^ %d = %.0f\n", b, p, pow(b, p));
printf("%d ^ %d = %d", b, p, (int)pow(b, p)); /* explicit type casting */
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows Taskbar icons: DEV, zm, Chrome, File Explorer, Paint, Word, Excel, Powerpoint, Pictures, Task View, Task Manager.

System tray: Keyboard, Mouse, Network, Battery, Volume, Date/Time (10:01 AM, 24-Oct-24).

Output window content:

```
Enter base, power values 2 5
2 ^ 5 = 32.000000
2 ^ 5 = 32
2 ^ 5 = 32
```

Add two numbers without using + operator:

The screenshot shows a Windows desktop environment. At the top is the Windows Taskbar with various pinned icons. Below it is a full-screen application window for the Turbo C++ compiler (TC). The window has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The main editor area displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b;
    clrscr();
    printf("Enter a, b values ");
    scanf("%d %d",&a, &b);
    printf("Sum = %d\n",a-(-b));
    printf("Sum = %d\n",a- -b);
    printf('Sum = %d\n',a-(~b)-1);
    getch();
}
```

The status bar at the bottom of the application window shows "Line 10 Col 29 Insert Indent Tab Fill Unindent * E:9AM.C". The system tray at the bottom right of the screen shows the date and time as "10:04 AM 24-Oct-24".

$a - (\sim b) - 1$

$10 - (\sim 20) - 1$

$10 - (-21) - 1$

$10 + 21 - 1 = 30$

Swap [interchange] of two numbers:

Without using operators:

TC

File Edit Run Compile Project Options Debug Break/watch

Line 9 Col 38 Insert Indent Tab Fill Unindent * E:9AM.C

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

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

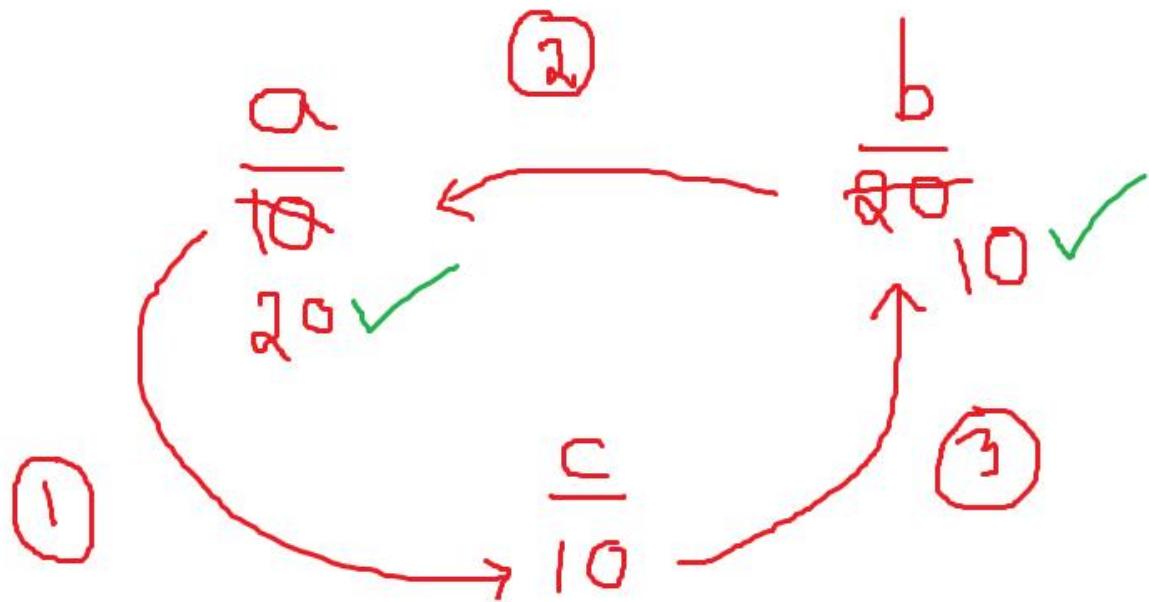
Windows Taskbar icons: DEV, zm, Chrome, File Explorer, Paint, Word, Excel, Powerpoint, Pictures, Control Panel, Task View, Start button.

System tray: Keyboard, Mouse, Battery, Signal strength, Date and Time (10:14 AM, 24-Oct-24).

Output window content:

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

Using 3rd variable:



```
Line 10 Col 38 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 "); scanf("%d %d",&a, &b);
printf("Before swap a=%d, b=%d\n",a,b);
c=a; a=b; b=c;
printf("After swap a=%d, b=%d\n",a,b);
getch();
}
```

• Watch

F1-Help **F5-Zoom** **F6-Switch** **F7-Trace** **F8-Step** **F9-Make** **F10-Menu**

```
Enter a, b values 2 5  
Before swap a=2, b=5  
After swap a=5, b=2
```

Without using 3rd variable:

TC

File Edit Run Compile Project Options Debug Break/watch

Line 12 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, b values ");
scanf("%d %d",&a, &b);
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\n",a,b);
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Enter a, b values 10 20
Before swap a=10, b=20
After swap a=20, b=10

10:18 AM 24-Oct-24

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

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

$$\begin{array}{r}
 a \backslash \overline{10} \\
 2 \backslash \overline{5-0} \\
 2 \backslash \overline{2-1} \\
 \hline 1 - 0
 \end{array}$$

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

$a=10, b=20$

$$\begin{array}{l}
 a=a^b; \\
 a=10=01010 \\
 b=20=\underline{10100} \\
 \hline 11110=30
 \end{array}$$

11110 + 10100 = 101010

$a=30, b=20$

$$\begin{array}{l}
 b=a^b; \\
 a=30=11110 \\
 b=20=\underline{10100} \\
 \hline 01010=10
 \end{array}$$

$a=30, b=10$

$$\begin{array}{l}
 a=a^b; \\
 a=30=11110 \\
 b=10=\underline{01010} \\
 \hline 10100=20
 \end{array}$$

$a=20, b=10$

Read a baby age in no of days and find the baby age in years, months, weeks and days.

$$y = 500 / 365 = 1$$

$$m = 500 \% 365 = 135 / 30 = 4$$

$$w = 500 \% 365 = 135 \% 30 = 15 / 7 = 2$$

$$d = 500 \% 365 = 135 \% 30 = 15 \% 7 = 1$$

$$\begin{array}{r} \text{tdays} \\ 365) 500 (1 - y \\ \quad \quad \quad 365 \\ \hline 30) 135 (4 - m \\ \quad \quad \quad 120 \\ \hline 15 (2 - w \\ \quad \quad \quad 14 \\ \hline 1 - d \end{array}$$

TC

File Edit Run Compile Project Options Debug Break/watch

Line 12 Col 68 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int tdays,y,m,w,d;
clrscr();
printf("Enter baby age in days "); scanf("%d",&tdays);
y=tdays/365;
m=tdays%365/30;
w=tdays%365%30/7;
d=tdays%365%30%7;
printf("Baby age %d years %d months %d weeks and %d days",y,m,w,d);
getch();
}
```

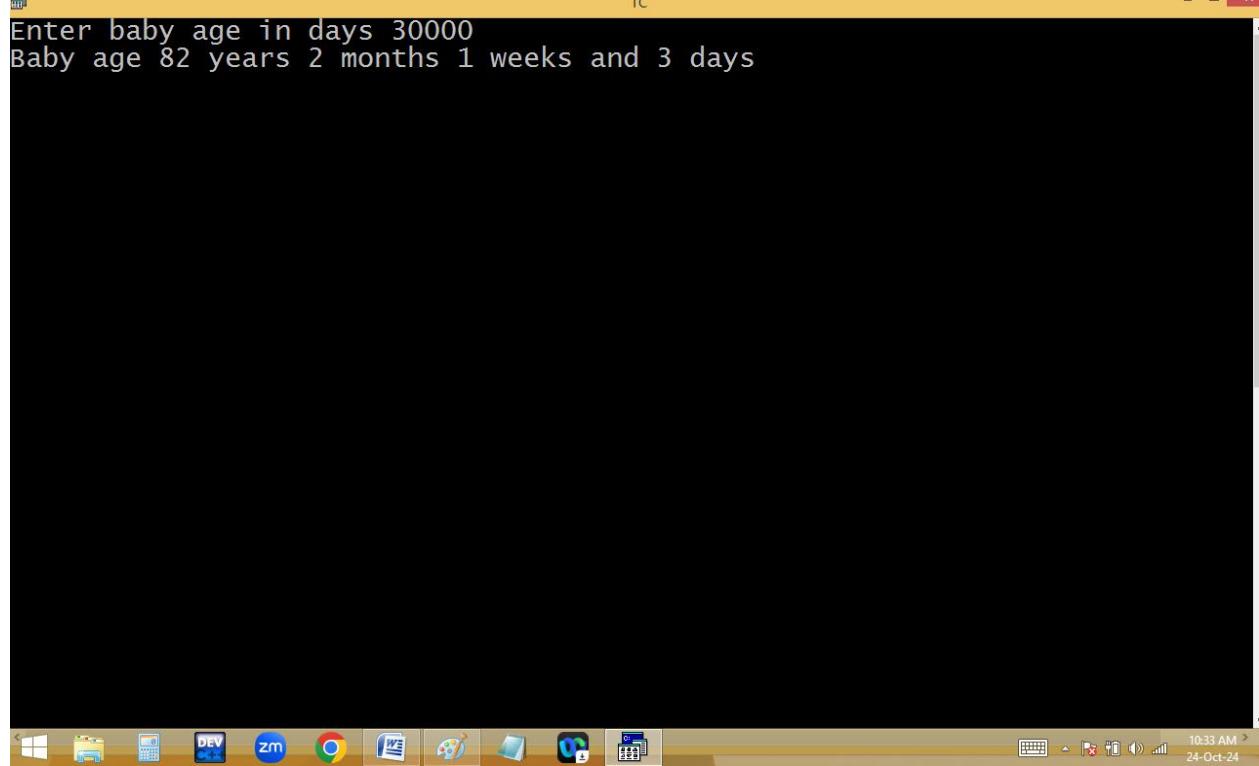
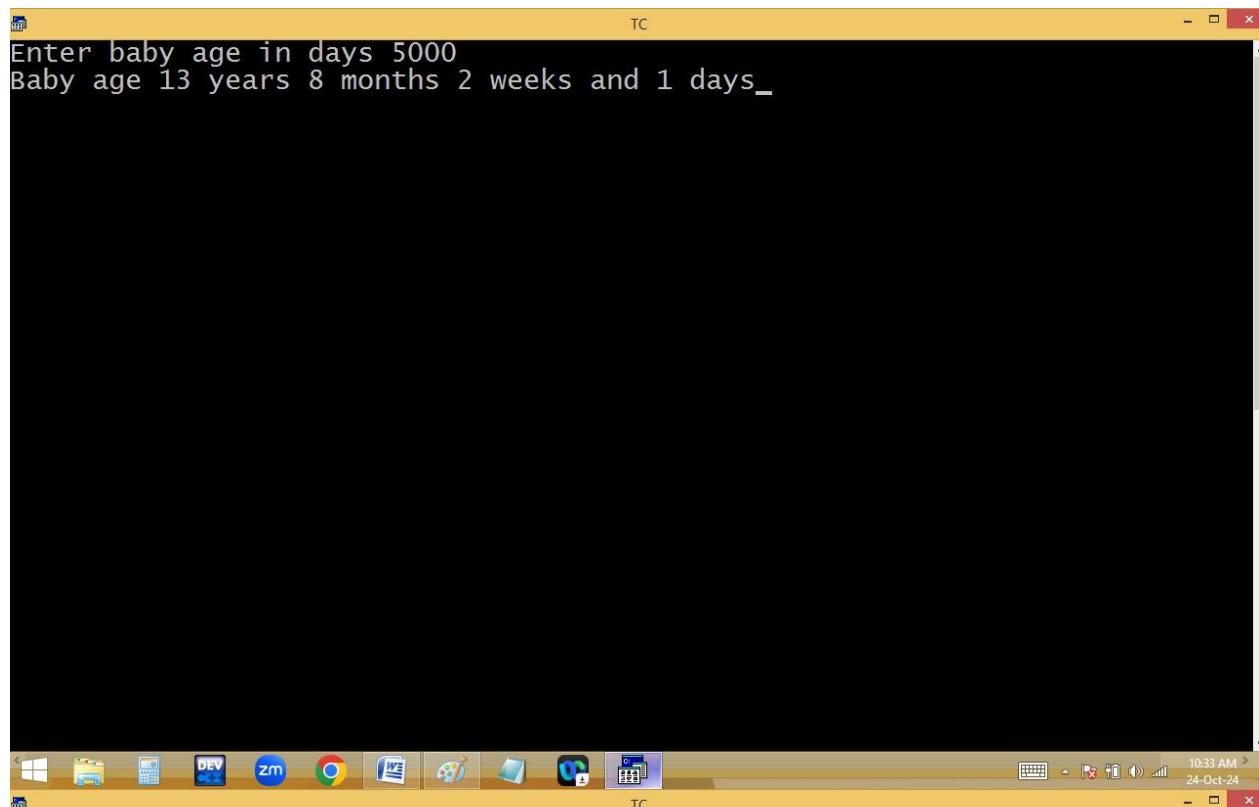
Watch

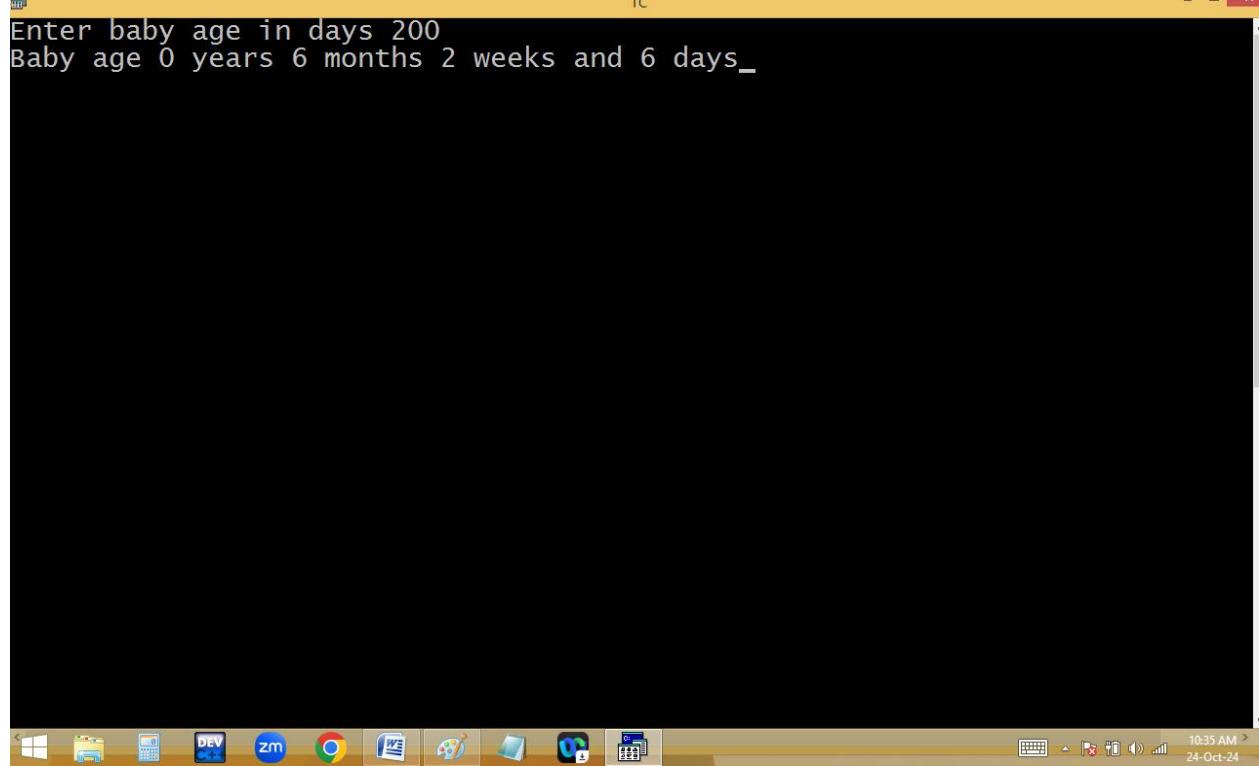
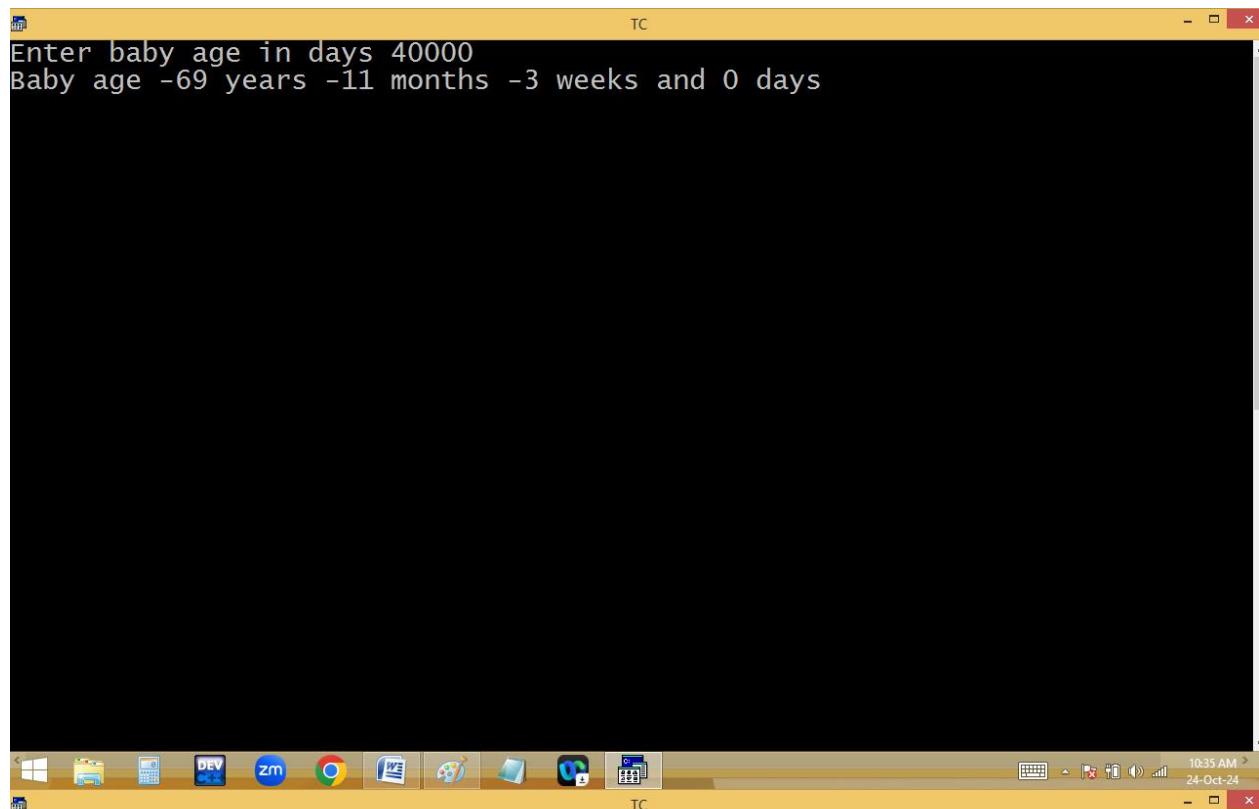
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

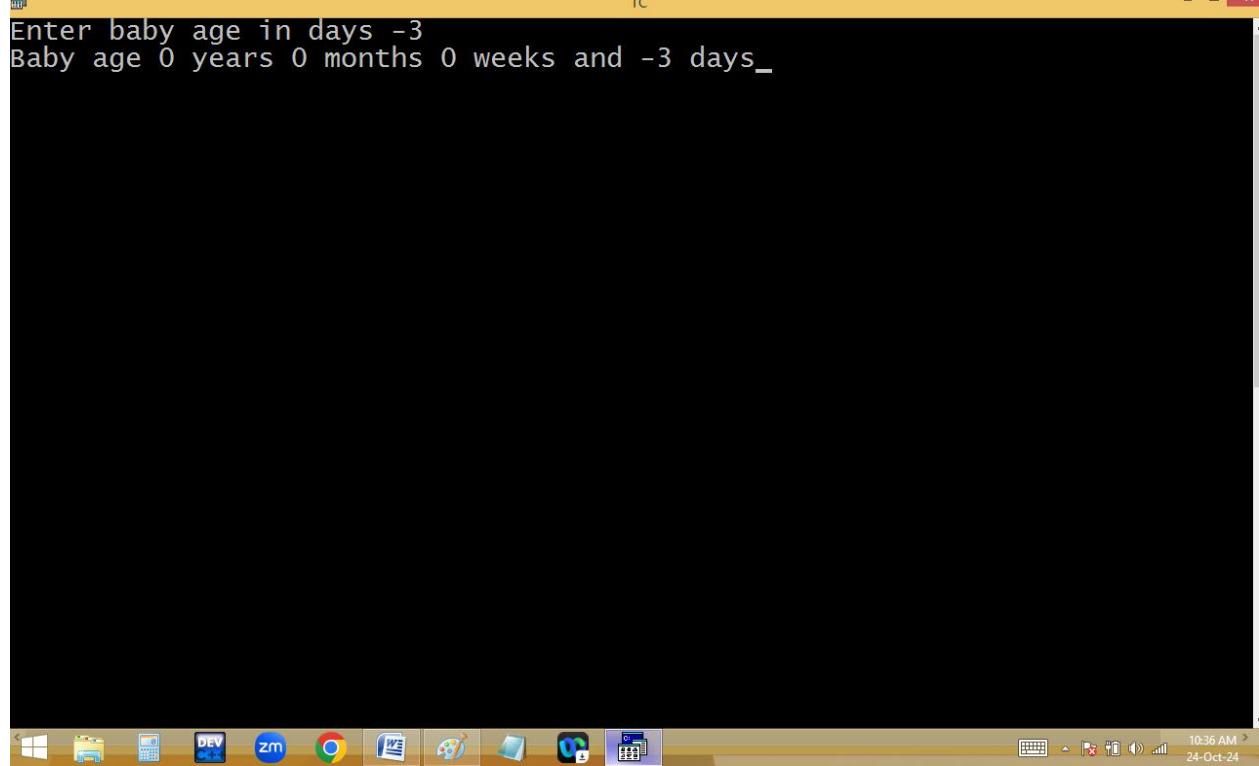
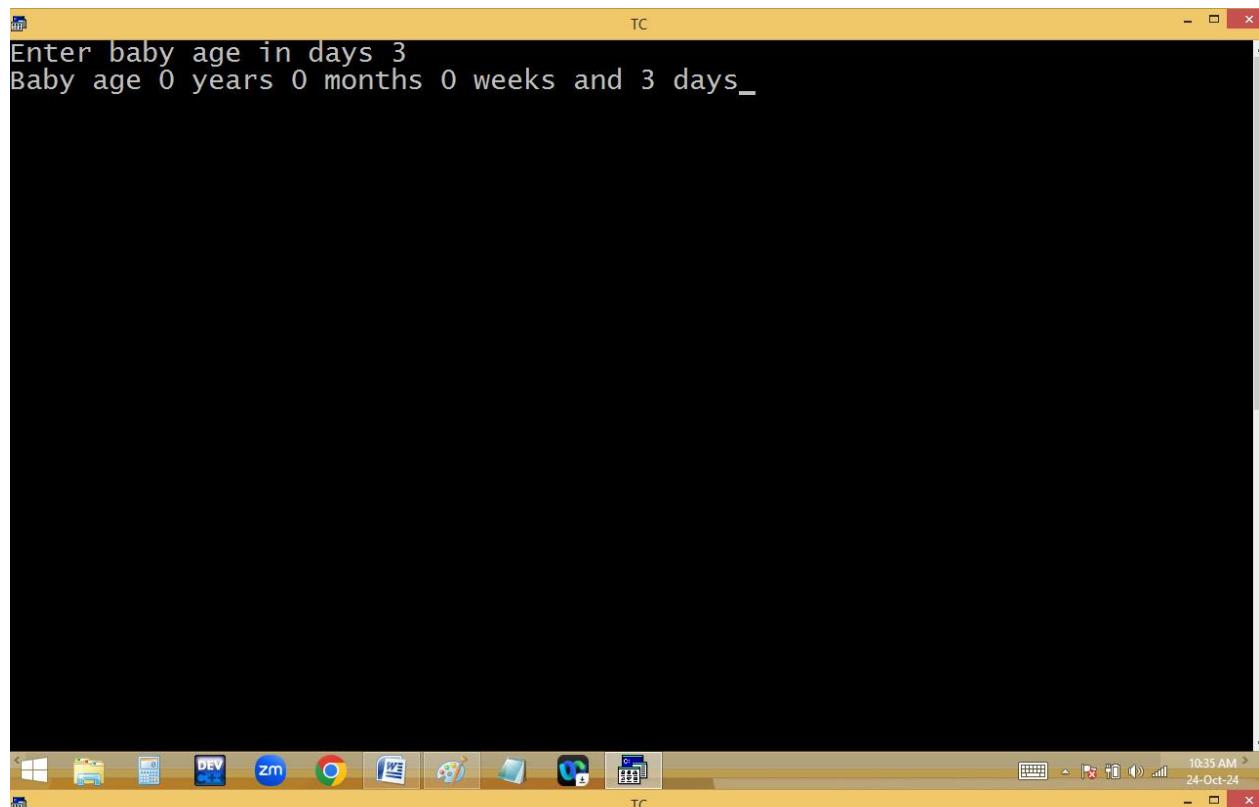
10:33 AM
24-Oct-24

Enter baby age in days 500
Baby age 1 years 4 months 2 weeks and 1 days_

10:33 AM
24-Oct-24







Read baby age in years, months, weeks and days. Find total no of days.

1 y 4 m 2 w 4 days = 500 days

$1 * 365 + 4 * 30 + 2 * 7 + 1 = 500 \text{ days}$

TC

File Edit Run Compile Project Options Debug Break/watch

Line 10 Col 33 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int tdays,y,m,w,d;
clrscr();
printf("Enter baby age in years, months, weeks and days ");
scanf("%d %d %d %d",&y,&m,&w,&d);
tdays=y*365+30*m+w*7+d;
printf("Baby age %d days",tdays);
getch();
}
```

Watch

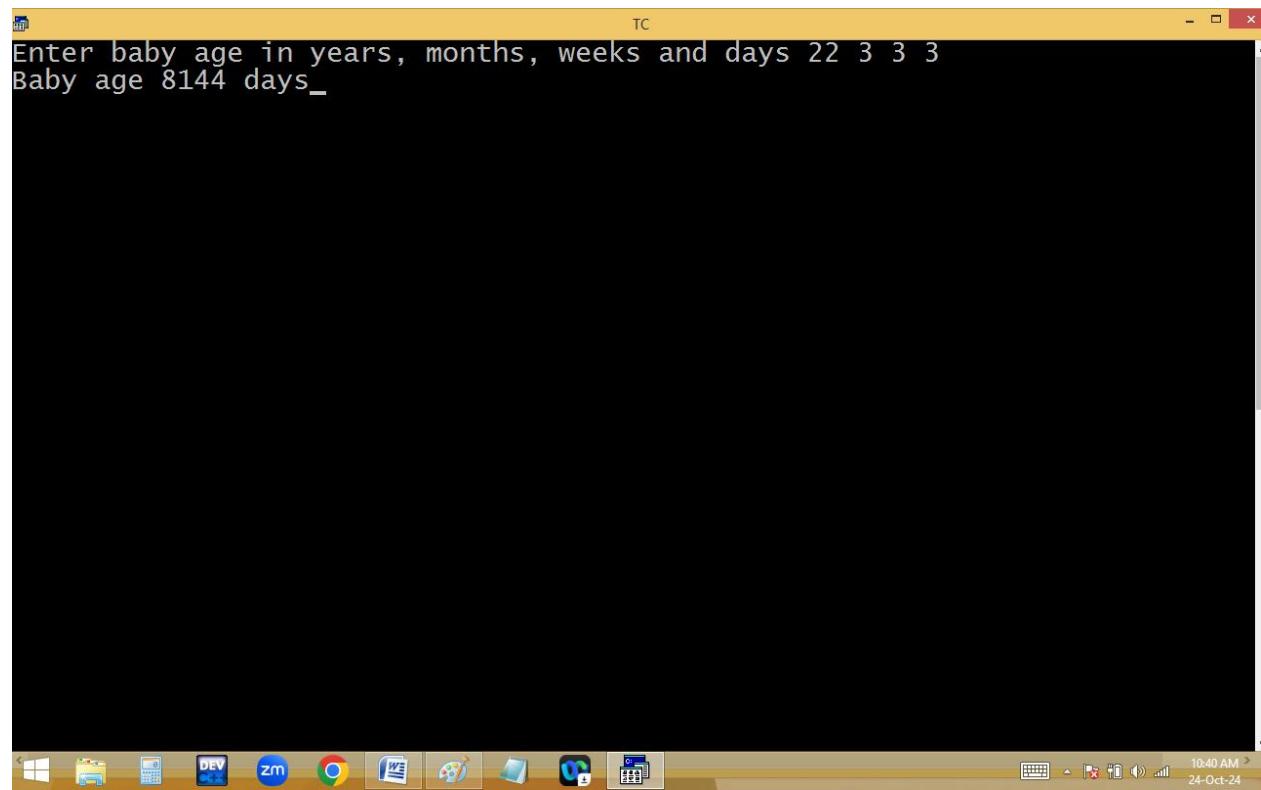
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Enter baby age in years, months, weeks and days 1 4 2 1
Baby age 500 days_

10:39 AM 24-Oct-24

TC

10:39 AM 24-Oct-24



Celsius to Fahrenheit conversion:

Celsius to Fahrenheit:

$$F = c * 1.8 + 32$$

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window title bar includes the menu bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch, Line 9, Col 47, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The main area of the terminal displays the following C code:

```
#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 Celsius is %.1f Fahrenheit",c,f);_
getch();
}
```

Below the terminal window, the Windows taskbar is visible, featuring the Start button, pinned icons for File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Paint, File Explorer, and File Explorer again, and system status icons for battery, signal, and volume. The system tray shows the date and time as 9:27 AM 25-Oct-24. The desktop background is a solid black.

A screenshot of a Windows desktop environment. In the foreground, a terminal window titled "TC" is open. The window has a menu bar with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, status information shows "Line 9 Col 33 Insert Indent Tab Fill Unindent * E:9AM.C". The main text area of the terminal contains the following C code:

```
#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 terminal window also displays function keys at the bottom: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Menu. The desktop background is blue, and the taskbar at the bottom shows various pinned icons and the system clock indicating "9:29 AM 25-Oct-24".

```
TC
Enter temp in Celsius 37
37.0° Celsius is 98.6° Fahrenheit

Enter temp in Celsius 40
40.0° Celsius is 104.0° Fahrenheit_
```

Fahrenheit to Celsius:

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

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the following C code:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 15 Insert Indent Tab Fill Unindent * E:9AM.C
#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 code, the terminal window shows the output of the program:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
Enter temp in Fahrenheit 98.6
98.6° Fahrenheit is 37.0° Celsius
```

The desktop background is black. At the bottom, there is a taskbar with several icons, including a file explorer, a browser, and a calculator. The system tray shows the date and time as 9:31 AM 25-Oct-24.

Finding simple interest:

$$p*t*r/100$$

$$\begin{array}{r} 1000 \\ \times 250 \\ \hline 1250 \end{array}$$

10

$$\frac{2.5 \times 100 \times 10}{25 \times 10 = 250}$$

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
float p,r,si,tot;
int t;
clrscr();
printf("Enter the principle, time and rate of interest ");
scanf("%f %d %f",&p, &t, &r);
si = p*t*r/100;
tot = p + si;
printf("Si=%f, Total=%f",si,tot);
getch();
}
```

Below the code, the terminal window shows the output of the program. It prompts the user to enter the principle, time, and rate of interest, and then displays the calculated simple interest (Si) and total amount (Total). The system tray at the bottom of the screen shows various icons and the date and time (9:37 AM, 25-Oct-24).

Finding sqrt of given no:

100 sqrt is 10

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The terminal window title bar reads "TC" and the menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom indicates "Line 3 Col 17 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the terminal window is:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int n;
clrscr();
printf("Enter the no ");scanf("%d",&n);
printf("%d SQRT is %d",n, sqrt(n));
getch();
}
```

The terminal window also displays the output of the program:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
Enter the no 100
100 SQRT is 0
```

The desktop background is black, and the taskbar at the bottom shows various pinned icons, including a DEV icon which is highlighted in blue. The system tray in the bottom right corner shows the date and time as "9:39 AM 25-Oct-24".

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program and its output.

The C program code is:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int n;
clrscr();
printf("Enter the no ");scanf("%d",&n);
printf("%d SQRT is %f\n",n, sqrt(n));
printf("%d SQRT is %.0f\n",n, sqrt(n));
printf("%d SQRT is %d",n, (int)sqrt(n));
getch();
}
```

The terminal window also shows the F10 key is mapped to "Menu".

The output of the program is:

```
Enter the no 100
100 SQRT is 10.000000
100 SQRT is 10
100 SQRT is 10
```

The desktop taskbar at the bottom shows various application icons, including a browser, file explorer, and system tray icons. The system tray indicates the date as 25-Oct-24 and the time as 9:40 AM.

Read two numbers and perform all arithmetic operations

[+ , - , * , %, /]:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The C code in the terminal window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c,d,e,f,g;
clrscr();
printf("Enter two no's ");
scanf("%d%d",&a,&b);
c=a+b;
d=a-b;
e=a*b;
f=a%b;
g=a/b;
printf("Sum=%d\n",c);
printf("Sub=%d\n",d);
printf("Pro=%d\n",e);
printf("Mod=%d\n",f);
printf("Div=%d\n",g);
getch();
}
```

The terminal window also displays the output of the program:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
Enter two no's 5 2
Sum=7
Sub=3
Pro=10
Mod=1
Div=2
```

The desktop taskbar at the bottom shows various application icons, including a DEV icon which likely represents the Turbo C++ IDE. The system tray in the bottom right corner shows the date and time as 9:50 AM on 25-Oct-24.

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in a Turbo C++ IDE.

The C program calculates various operations on two input numbers:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter two no's ");
scanf("%d%d",&a,&b);
printf("Sum=%d\n",a+b);
printf("Sub=%d\n",a-b);
printf("Pro=%d\n",a*b);
printf("Mod=%d\n",a%b);
printf("Div=%d\n",a/b);
getch();
}
```

The terminal output shows the results of the calculations:

```
Enter two no's 5 2
Sum=7
Sub=3
Pro=10
Mod=1
Div=2
```

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 indicates Line 12, Col 17, Insert, Indent Tab, Fill Unindent, * E:9AM.C. The code in the editor window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter two no's ");
scanf("%d%d",&a,&b);
printf("Sum=%d\n",a+b);
printf("Sub=%d\n",a-b);
printf("Pro=%d\n",a*b);
printf("Mod=%d\n",a%b);
printf("Div=%.2f\n",a/b);
getch();
}
```

The output window displays the results of the program execution:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
```

```
Enter two no's 5 2
Sum=7
Sub=3
Pro=10
Mod=1
printf : floating point formats not linked
Abnormal program termination
```

The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 9:54 AM, 25-Oct-24.

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The C program calculates various operations on two input numbers (5 and 2) and prints the results:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter two no's ");
scanf("%d%d",&a,&b);
printf("Sum=%d\n",a+b);
printf("Sub=%d\n",a-b);
printf("Pro=%d\n",a*b);
printf("Mod=%d\n",a%b);
printf("Div=%.2f\n", (float)a/b);
getch();
}
```

The terminal output shows the following results:

```
Enter two no's 5 2
Sum=7
Sub=3
Pro=10
Mod=1
Div=2.50
```

A screenshot of a Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C) with the file name "E:9AM.C". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows "Line 13 Col 21 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
float a,b;
clrscr();
printf("Enter two no's ");scanf("%f%f",&a,&b);
printf("Sum=%.2f\n",a+b);
printf("Sub=%.2f\n",a-b);
printf("Pro=%.2f\n",a*b);
printf("Mod=%.2f\n",fmod(a,b));
printf("Div=%.2f\n",a/b);
getch();
}
```

The keyboard status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Menu. The taskbar at the bottom has icons for various applications including Windows File Explorer, Task View, Control Panel, and several pinned icons. The system tray shows the date and time as 9:57 AM, 25-Oct-24.

```
TC
Enter two no's 5 2
Sum=7.00
Sub=3.00
Pro=10.00
Mod=1.00
Div=2.50
```



```
TC
Enter two no's 5.5 3.3
Sum=8.80
Sub=2.20
Pro=18.15
Mod=2.20
Div=1.67
```

Read a customer id, name, Quantity purchased and rate of item. Find the amount, 35% discount and total.

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 indicates Line 1, Col 24, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor calculates consumer details based on input id, name, quantity, and price, then prints the amount, discount, and total.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int id;
char name[20];
float qty,price,amount,disc,tot;
clrscr();
printf("Enter Consumer id, name, Quantity purchased and price of item ");
scanf("%d%s%f%f",&id,name,&qty,&price);
amount = qty * price;
disc = amount * 35/100; /* 0.35 */
tot = amount - disc;
printf("Amount=%.2f\n",amount);
printf("Disc=%.2f\n",disc);
printf("Total=%.2f",tot);
getch();
}
```

The terminal window displays the following output:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
Enter Consumer id, name, Quantity purchased and price of item
1 Krish 1 98000
Amount=98000.00
Disc=34300.00
Total=63700.00
```

Dynamic discount [runtime]:

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 top indicates Line 14, Col 27, and E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int id;
    char name[20];
    float qty, price, amount, disc, tot;
    clrscr();
    printf("Enter Consumer id, name, Quantity purchased and price of item ");
    scanf("%d%s%f%f", &id, name, &qty, &price);
    amount = qty * price;
    printf("Amount=%.2f\n", amount);
    printf("Enter discount percentage "); scanf("%f", &disc);
    disc = amount * disc/100;
    tot = amount - disc;
    printf("Disc=%.2f\n", disc);
    printf("Total=%.2f", tot);
    getch();
}
```

The F10 key is highlighted in red in the status bar, which also lists other function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Menu. The taskbar at the bottom shows various application icons, and the system tray displays the date and time (10:19 AM, 25-Oct-24).

```
TC
Enter Consumer id, name, Quantity purchased and price of item
1 kumari 1 1
Amount=1.00
Enter discount percentage 0
Disc=0.00
Total=1.00
```

```
TC
Enter Consumer id, name, Quantity purchased and price of item
2 Krish 1 98000
Amount=98000.00
Enter discount percentage 80
Disc=78400.00
Total=19600.00
```

```
TC
Enter Consumer id, name, Quantity purchased and price of item
3 wife 1 10000
Amount=10000.00
Enter discount percentage 100
Disc=10000.00
Total=0.00
```

```
TC
Enter Consumer id, name, Quantity purchased and price of item
5 gf 1 10000
Amount=10000.00
Enter discount percentage 200
Disc=20000.00
Total=-10000.00
```

Variables:

Variable is a container is used to store the values in our programs.

Variable is a named memory [bytes] where we can store and manipulate [modify] the values in our programs.

All the variables are stored in primary memory i.e. RAM Only. Due to this the variables are automatically deleted after the function / program execution. i.e. all the variables are temporary.

in c compiler we should have to declare the variables in first line of any function. In c++ we can declare anywhere.

Every variable is having 2 stages.

1. Variable declaration / declared

Eg: int a;

2. Variable initialization / defined

Eg: a=100;

Syntax:

Datatype variable[=value], var[=value],.....;

Eg:

int id=1234, children;

char name[]="Satya", gender='M';

float height = 5.8;

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 30 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int id=1234, children;
char name[]="Satya", gender='M';
float height=5.8;
clrscr();
printf("Id=%d\n",id);
printf("Name=%s\n",name);
printf("Gender=%c\n",gender);
printf("children=%d\n",children);
printf("Height=%.2f",height);
getch();
}
```

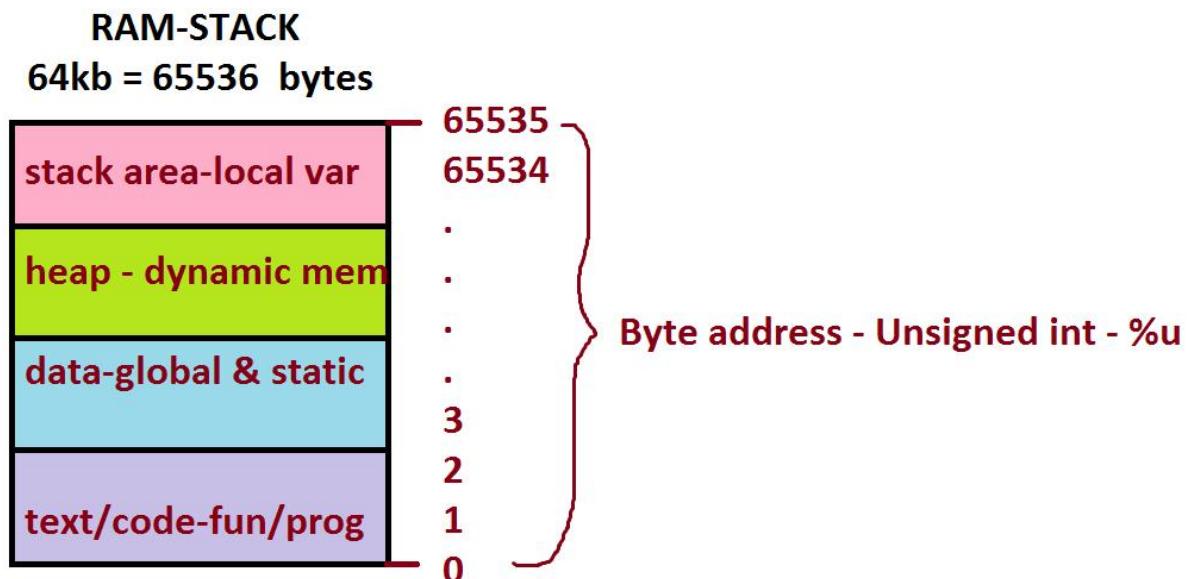
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

10:43 AM 25-Oct-24

```
TC
Id=1234
Name=Satya
Gender=M
children=1824
Height=5.80
```

10:43 AM 25-Oct-24

Memory allocation for variables:



Ternary / conditional operator ?:

It is similar to if else / ladder if in working style.

It allows to complete if else / ladder if in a single statement.

When we are working with if else/ladder if it is going to take more than one line of statements. Ternary operator is going to finish the same task in a single statement.

But the difference between if ...else and ternary operator is ternary operator supports only one statement at a time and if supports any number of statements.

It is having 3 expressions. Hence it is called ternary operator.

It is starting with a condition. Hence it is called conditional operator.

Syntax:

condition ? true statement : false statement ;
exp1/op1 exp2/op2 exp3/op3

If condition true, statement after ? executed.

If condition false, statement after : is executed.

When compared with if else, conditional operator **performance is high**.

Conditional part ? true part : false part ;

Write a c program to find even/odd without using if..else /
write a c program to find even/odd using single statement:

4%2=0
if(n%2==0) p("even");
5%2=1
else p("odd");

8%2=0
n%2==0 ? "Even" : "Odd";
7%2=1

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in the Turbo C++ IDE.

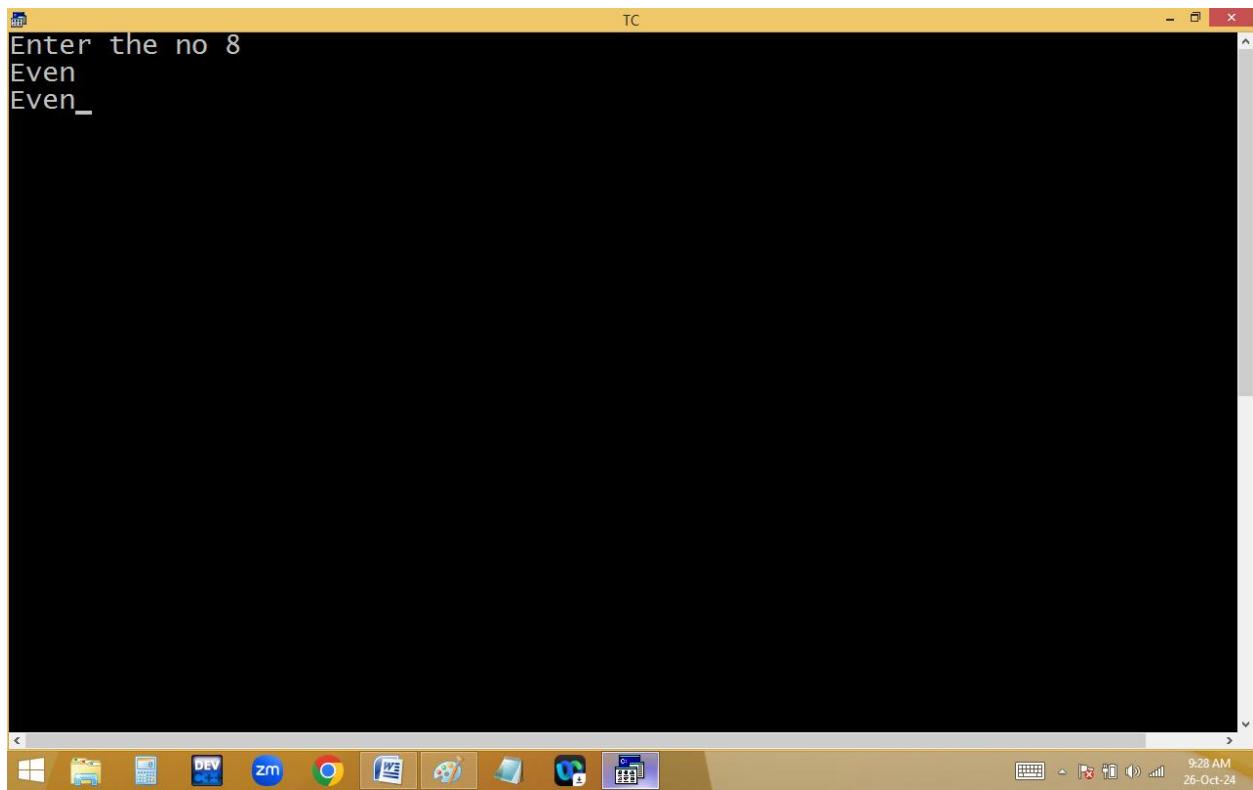
The terminal window title bar reads "TC" and the status bar indicates "Line 9 Col 47 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the terminal window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter the no ");
scanf("%d",&n);
if(n%2==0)printf("Even\n"); else printf("Odd\n");
printf(n%2==0?"Even":"Odd");
getch();
}
```

The terminal window also shows the system menu bar at the top with options like File, Edit, Run, Compile, Project, Options, Debug, and Break/watch.

The desktop taskbar at the bottom contains icons for various applications including File Explorer, Task View, Control Panel, and others. The system tray shows the date and time as 9:27 AM 26-Oct-24.



```
Enter the no 8
Even
Even_
```

Finding max in 2 no's using ternary operator?

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 top right indicates Line 10, Col 33, and the file E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a, b values ");
scanf("%d %d",&a, &b);
if(a>b) printf("a is big\n");else printf("b is big\n");
printf(a>b?"a is big":"b is big");
getch();
}
```

The keyboard status bar at the bottom shows F1-Help through F10-Menu, along with NUM and a scroll bar. The taskbar at the bottom displays various application icons.

The screenshot shows the terminal window of the IDE displaying the output of the program. The command "Enter a, b values 1 3" is entered, followed by "b is big" and "b is big_". The taskbar at the bottom shows the same set of application icons as the previous screenshot.

```
TC
Enter a, b values 9 2
a is big
a is big
```



```
TC
Enter a, b values 3 3
b is big
b is big
```



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 top right indicates Line 10, Col 25, Insert, Indent Tab, Fill Unindent, * E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a, b values ");
scanf("%d %d",&a, &b);
if(a>b) printf("a is big\n");else if(b>a)printf("b is big\n");else
printf("Both are equal\n");
printf(a>b?"a is big":b>a?"b is big":"Both are equal");
getch();
}
```

The toolbar below the menu bar includes F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM keys. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 9:38 AM 26-Oct-24.

The screenshot shows the terminal window of the IDE displaying the output of the executed program. The terminal window title is TC. The output text is:

```
Enter a, b values 2 2
Both are equal
Both are equal_
```

The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 9:38 AM 26-Oct-24.

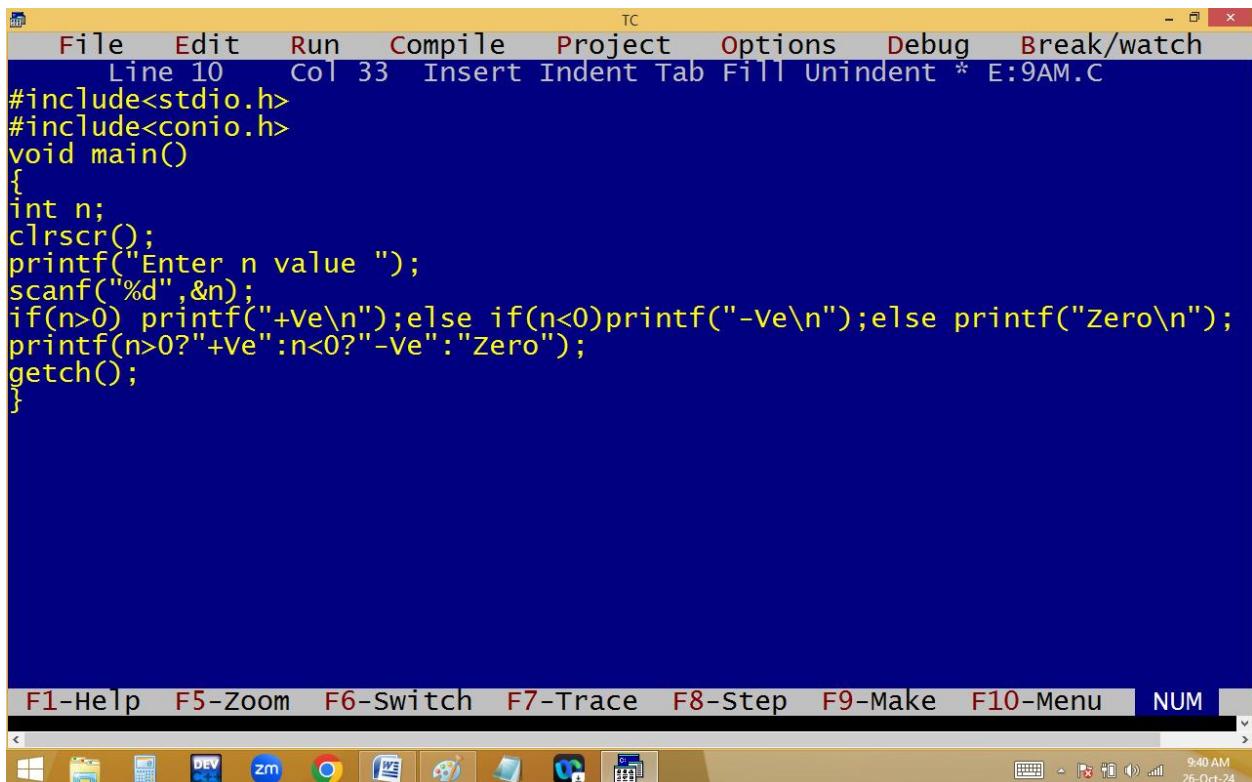
```
TC
Enter a, b values 1 2
b is big
b is big
```



```
TC
Enter a, b values 2 1
a is big
a is big_
```



Finding +Ve / -Ve / 0 using ternary operator



A screenshot of a Windows operating system desktop. 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 also shows "Line 10" and "Col 33". The code in the terminal window is:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 10 Col 33 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter n value ");
scanf("%d",&n);
if(n>0) printf("+ve\n");else if(n<0)printf("-ve\n");else printf("Zero\n");
printf(n>0?"+Ve":n<0?"-Ve":"Zero");
getch();
}
```

The F10 key is highlighted in red at the bottom of the terminal window.



A screenshot of a Windows operating system desktop. At the top is a taskbar with various icons. Below it is a terminal window titled "TC". The terminal window displays the output of the program:

```
Enter n value 9
+Ve
+Ve_
```

The F10 key is highlighted in red at the bottom of the terminal window.

```
TC
Enter n value -8
-Ve
-Ve_
```

```
TC
Enter n value 0
Zero
Zero_
```

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "Line 7 Col 9 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char a=65,b=66,c=a+b;
clrscr();
printf("c=%d",c);
getch();
}
```

The status bar at the bottom shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar at the bottom has icons for various applications like Windows, File Explorer, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, and File Explorer.

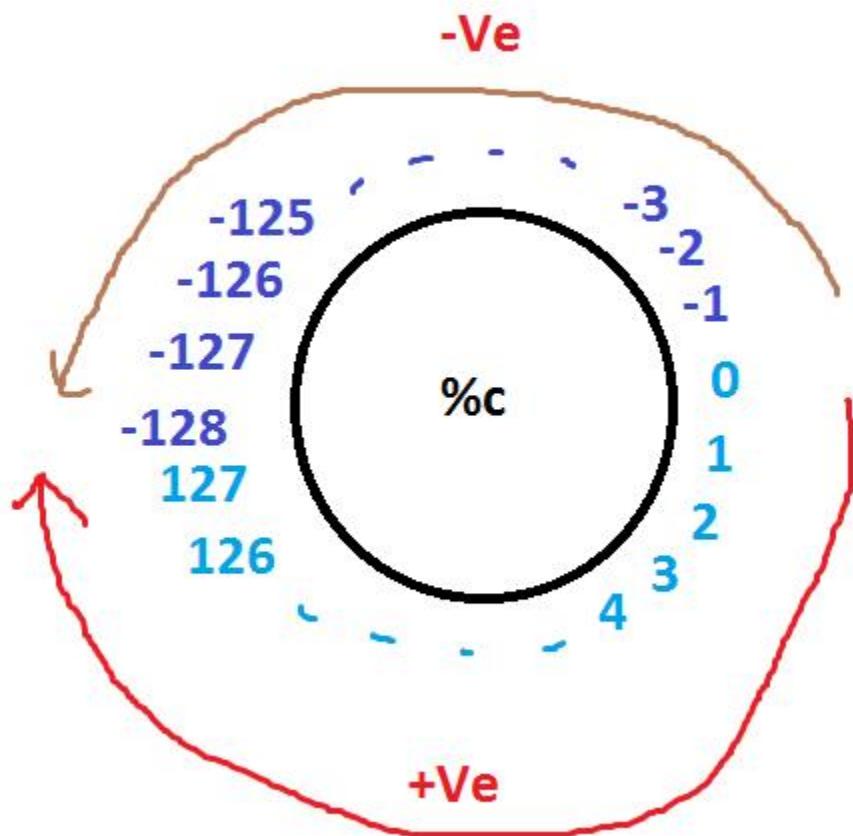
A screenshot of a terminal window titled "TC". The output displayed is "C=-125". The taskbar at the bottom is identical to the one in the previous screenshot.

Character cycle:

C using ASCII character set, which comes with 256 characters. They are divided into 2 types.

1. Signed characters → -128 to +127 → %c
2. Unsigned characters → 0 to 255 → %c

singed / unsigned char cycle



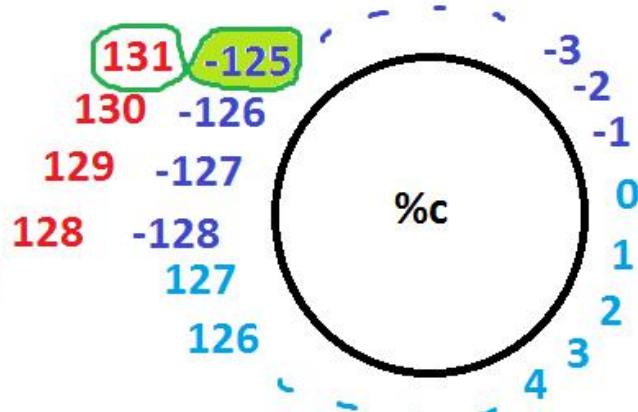
singed / unsigned char

$$a = 65$$

$$\underline{b = 66}$$

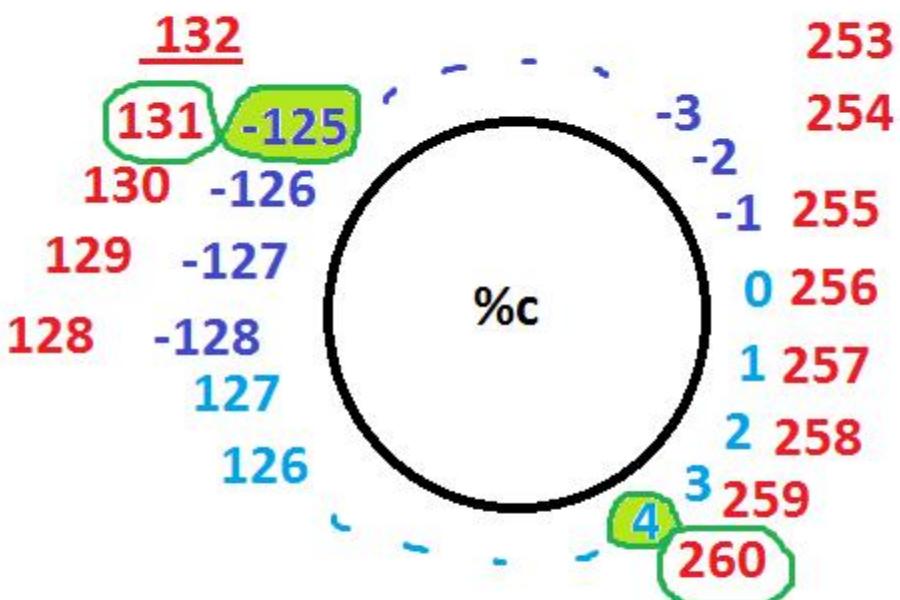
c=131

$$\begin{array}{r} \underline{131} \\ -128 \\ \hline 3 \end{array}$$



$$\begin{array}{r} 256 \\ \underline{-131} \\ -125 \end{array}$$

singed / unsigned char

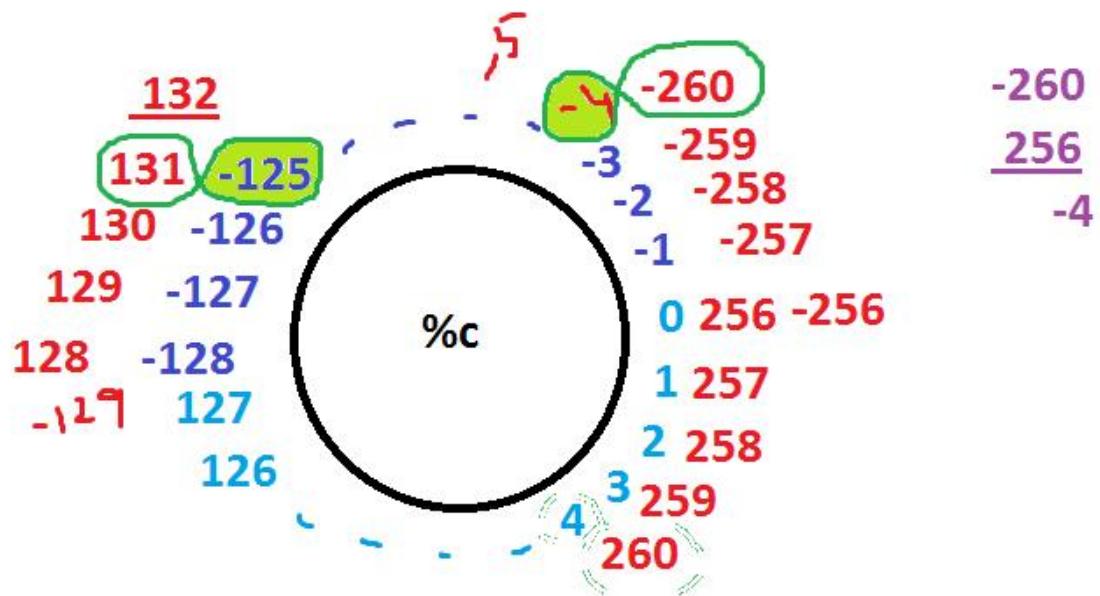


260

-256

4

singed / unsigned char



TC

File Edit Run Compile Project Options Debug Break/watch
Line 5 Col 10 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
unsigned char a=260;
clrscr();
printf("a=%d\n",a);
a=-260;
printf("a=%d",a);
getch();
}
```

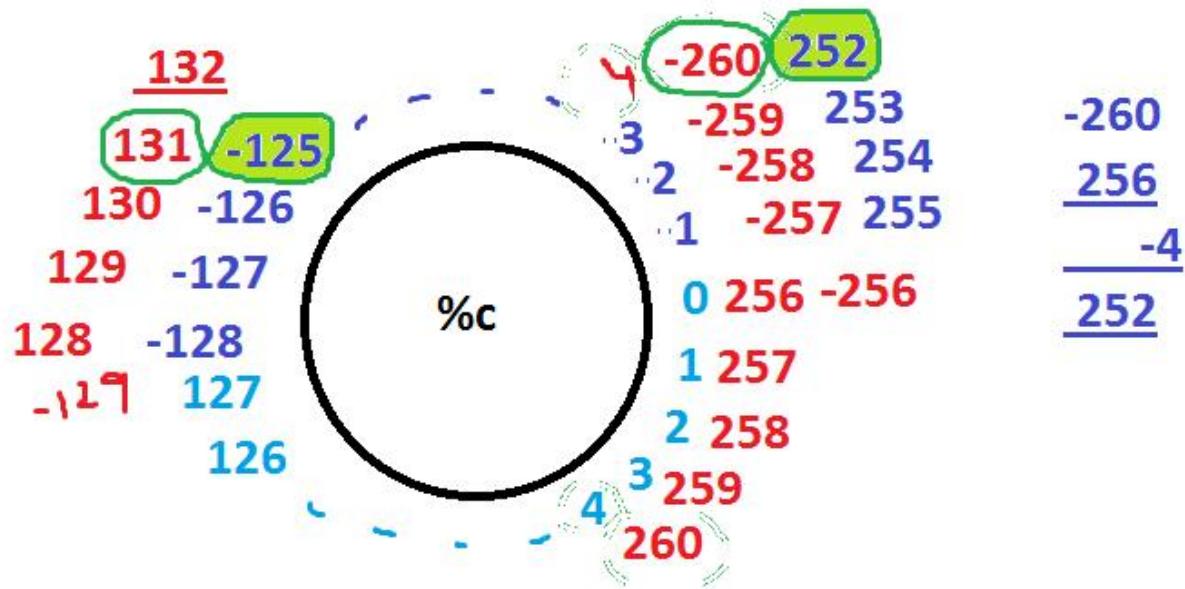
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

a=4
a=252

TC

a=4
a=252

unsigned char



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 indicates Line 11, Col 15, and the file E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=32768;
clrscr();
printf("a=%d\n",a); /* -32768 */
a=32770;
printf("a=%d\n",a); /* -32766 */
a=-32770;
printf("a=%d\n",a); /* +32766 */
a=65540;
printf("a=%d\n",a); /* 4 */
a=-65540;
printf("a=%d",a); /* -4 */
getch();
}
```

The output window at the bottom displays the following text:

```
a=-32768
a=-32766
a=32766
a=4
a=-4
```

This screenshot shows the terminal window of the IDE, which displays the output of the previously run C program. The text shown is identical to the output window in the previous screenshot.

```
a=-32768
a=-32766
a=32766
a=4
a=-4
```

Int cycle:

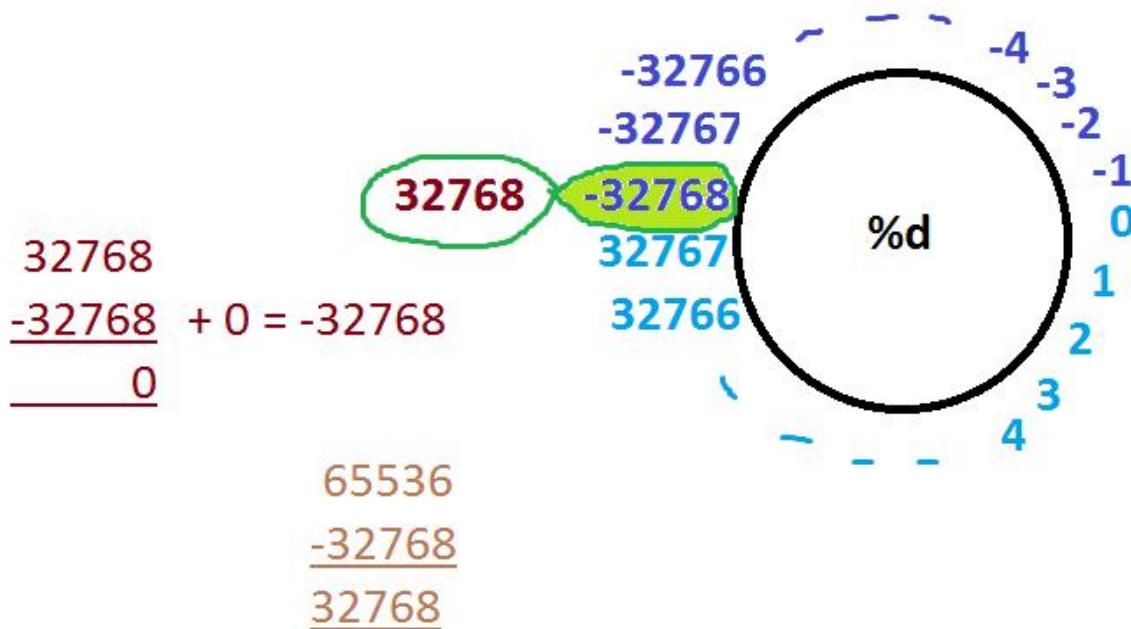
C is working under 16 bit compiler i.e. $2^{16} = 65536$

Again this value divided into 2 types.

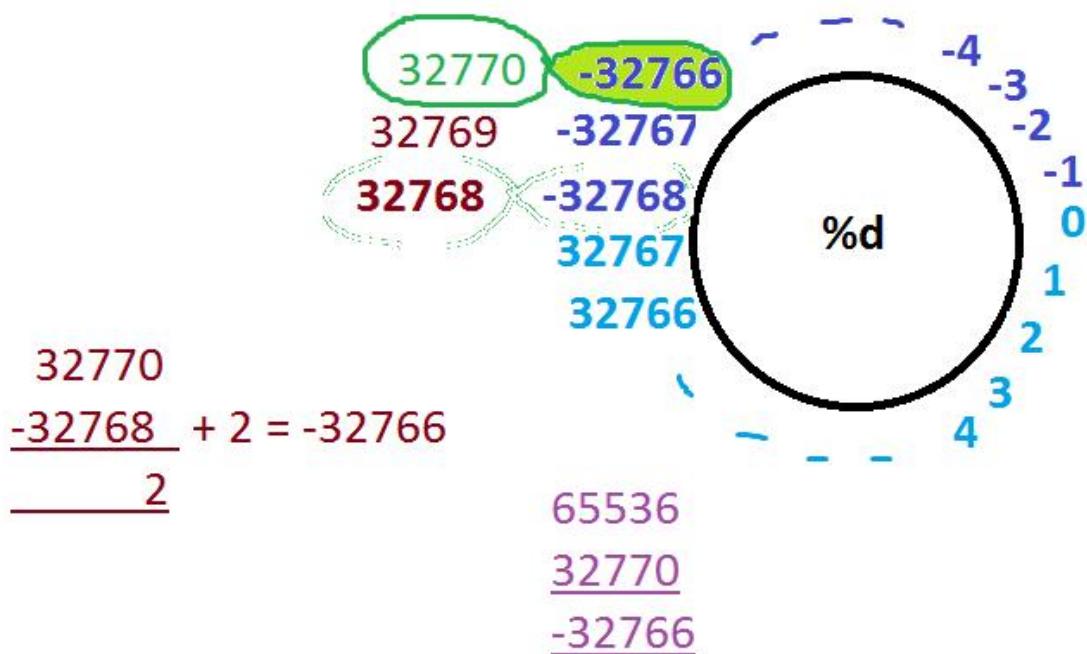
1. Signed int → -32768 to +32767
2. Unsigned int → 0 to 65535

signed int cycle

a = 32768



signed int cycle

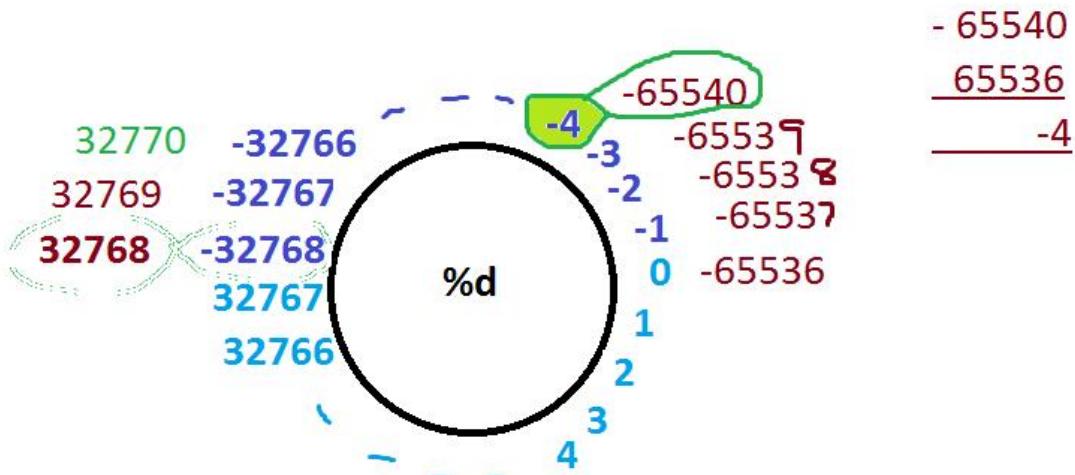


signed int cycle

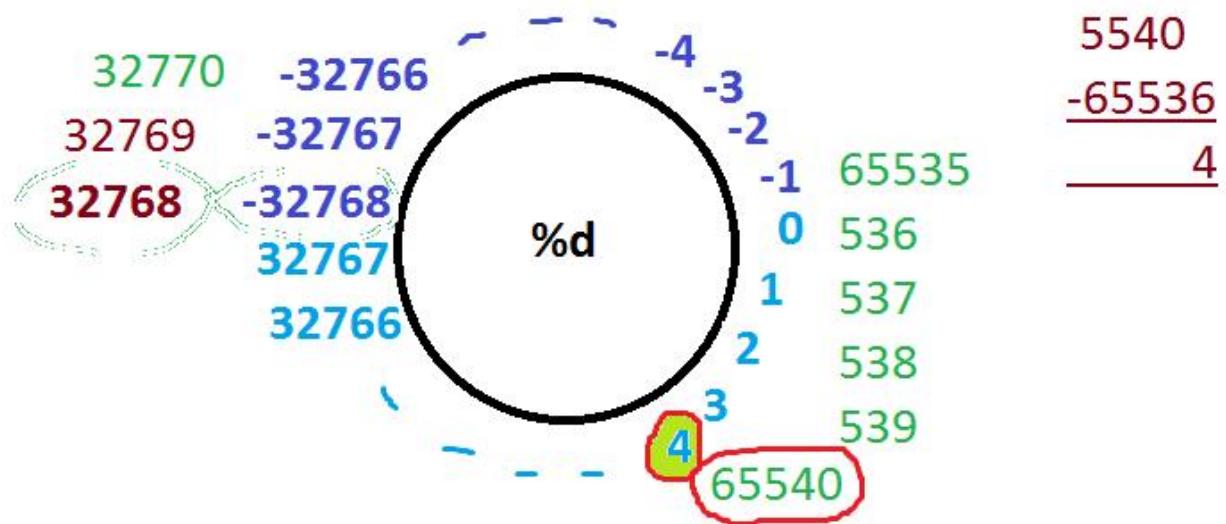
a = -32770



signed int cycle



signed int cycle



TC

File Edit Run Compile Project Options Debug Break/watch
Line 18 Col 21 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=37;
clrscr();
printf("%5d\n",a); /* - - - 37 */
printf("%-5d\n",a); /* 37- - - */
printf("%1d\n",a);
printf("%*d\n",5,a);
printf("%-*d\n",5,a);
printf("%$d\n",5,a);
printf("%.5d\n",a);
printf("%i + %i = %i\n",1,2,3);
printf("%id + %id = %id\n",1,2,3);
printf("%D + %d = %d\n",1,2,3);
printf("%d + %D = %d\n",1,2,3);
printf("%d + %d = %D\n",1,2,3);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM



10:41 AM 26-Oct-24

TC

```
37
37
37
37
%$d
00037
1 + 2 = 3
1d + 2d = 3d
%D + %d = %d
1 + %D = %d
1 + 2 = %D
```

—



10:41 AM 26-Oct-24

TC

File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 23 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
clrscr();
printf("%10.2f\n",1.5); /* - - - - - 1.20 */
printf("%-10.2f\n",1.5);
printf("%.2f\n",floor(1.5));
printf("%.2f\n",ceil(1.5));
printf("%.2f\n",1.5555);
printf("%.2f\n",1.2222);
printf("%.2f\n",1.2245);
printf("%.2f\n",1.9999);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

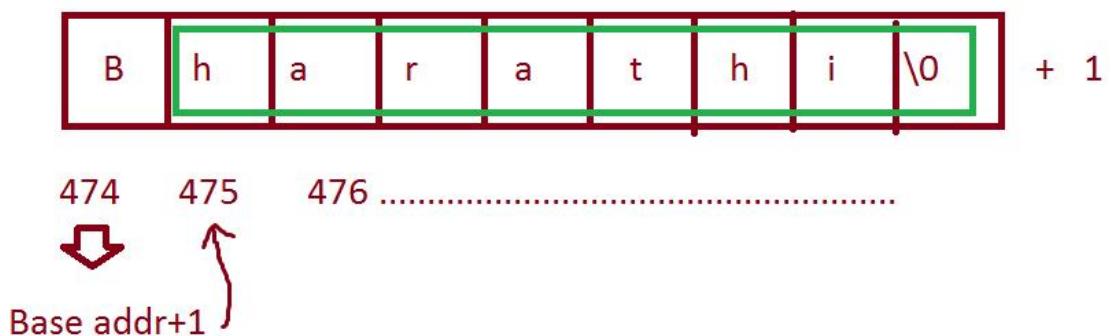


TC

```
1.50
1.50
1.00
2.00
1.56
1.22
1.22
2.00
```

10:51 AM 26-Oct-24





A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "Line 13 Col 13 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
clrscr();
printf("%10s\n","Kishore");
printf("%.3s\n","Kishore");
printf("%10.3s\n","Kishore");
printf("Bharathi\n"+1);
printf("Bharathi\n"+2);
printf("Bharathi addr %u\n","Bharathi");
printf("%d\n"+1,999);
printf("%d"+1);
getch();
}
```

The keyboard shortcut bar below the menu bar includes F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, NUM SC, and various function keys. The taskbar at the bottom shows icons for various applications like Windows, File Explorer, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, and File Explorer again.

A screenshot of the terminal window from the Turbo C++ IDE. The output of the program is displayed:

```
Kishore
Kis
      Kis
harathi
arathi
Bharathi addr 486
d
d
```

The terminal window has a yellow header bar with the letters "TC". The taskbar at the bottom is identical to the one in the previous screenshot, showing icons for Windows, File Explorer, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, and File Explorer again. The system tray shows the date and time as 10:59 AM 26-Oct-24.

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window title bar includes the text "TC", "File Edit Run Compile Project Options Debug Break/watch", and "Line 12 Col 20 Insert Indent Tab Fill Unindent * E:9AM.C". The main area of the terminal displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("Jodha\n", "Akbar");
    printf("Jodha %s\n", "Akbar");
    printf("Kahona %s\n", "Pyar ", "Hai");
    printf("Kahona %s %s\n", "Pyar ", "Hai");
    printf("%s Pyar \n", "Mine %s", " Kiya");
    printf("%s Pyar %s\n", "Mine %s", " Kiya");
    printf("Mine " " Pyar" " Kiya");
    getch();
}
```

Below the code, the terminal window shows the output of the program:

```
Jodha
Jodha Akbar
Kahona Pyar
Kahona Pyar Hai
Mine %s Pyar
Mine %s Pyar Kiya
Mine Pyar Kiya_
```

The desktop taskbar at the bottom contains icons for various applications including File Explorer, Control Panel, Task View, ZM, Google Chrome, Paint, and others. The system tray shows the date and time as "9:23 AM 28-Oct-24".

A screenshot of a Microsoft Windows operating system desktop. In the center is a window titled "TC" which is the TURBO C++ integrated development environment. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". A red error message "Error: Invalid pointer addition in function main" is displayed at the top of the code editor. The code itself is a simple C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Mine " + " Pyar" + " Kiya");
getch();
}
```

The taskbar at the bottom shows several pinned icons, including the Start button, File Explorer, Task View, DEV, zm, Google Chrome, FileZilla, Paint, and File Manager. The system tray shows the date and time as "9:24 AM 28-Oct-24".

The image shows a screenshot of a Windows operating system desktop. In the center is a terminal window titled "TC" with a dark blue background. The window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 9 Col 43 Insert Indent Tab Fill Unindent * E:9AM.C". The main area of the terminal contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Don-%d\n", printf("Bahu bali-2\n"));
printf("Dil-%d\n", printf("Saajan-%d\n",printf("Aashique-2\n")));
printf("Khan-%d\n",printf("Dilse-%d\r",printf("Jawaan\n")));
printf("Secunderabad-Biryani\rHyderabad");
getch();
}
```

When run, the code prints the following output to the terminal window:

```
Bahu bali-2
Don-12
Aashique-2
Saajan-11
Dil-10
Jawaan
Khan-87
Hyderabadbad-Biryani
```

The desktop environment includes a taskbar at the bottom with various icons for applications like File Explorer, Control Panel, and a browser. The system tray shows the date and time as 9:36 AM on 28-Oct-24.

Jawaan\n

Dilse 7\r

Khan-8

Secunderabad- Biryani\rHyderabad

Hyderabad



TC

File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 22 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("%o\n",10); /* decimal to octal */
printf("%d\n",012); /* octal to decimal */
printf("%x\n",35); /* dec to hexa */
printf("%x\n",45);
printf("%X\n",95);
printf("%d\n",0x24); /* hexa to dec */
printf("%x\n",035); /* octal to hexa */
printf("%o\n",0x25); /* hexa to oct */
printf("%d\n",-2<<2);_
printf("%x", -2<<2);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-M CAPS NUM

12
10
23
2d
5F
36
1d
45
-8
ffff8

10:00 AM 28-Oct-24

$$8 \overline{)10}$$

1-2✓

$$\begin{array}{r} 0 \ 1 \ 2 \\ \diagup \quad \diagdown \\ 8 \times 1 + 8 \times 2 \\ \hline 8 + 2 = 10 \end{array}$$

$$16 \overline{)35}$$

2-3✓

$$16 \overline{)45}$$

8-13 d

10-a, 11-b, 12-c, 13-d

$$16 \overline{)95}$$

5-15 F

$$\begin{array}{r} 0 \times 2 \ 4 \\ \diagup \quad \diagdown \\ 16 \times 2 + 16 \times 4 \\ \hline 32 + 4 = 36 \checkmark \end{array}$$

10-A, 11-B, 12-C, 13-D, 14-E, 15-F

octal to decimal

$$\begin{array}{r} 0 \ 3 \ 5 \\ \diagup \quad \diagdown \\ 8 \times 5 + 8 \times 5 \\ \hline 24 + 5 = 29 \end{array}$$

decimal to hexa

$$16 \overline{)29}$$

1-13 d✓

hexa to decimal

$$\begin{array}{r} 0 \times 2 \ 5 \\ \diagup \quad \diagdown \\ 16 \times 2 + 16 \times 5 \\ \hline 32 + 5 = 37 \end{array}$$

decimal to octal

$$8 \overline{)37}$$

4-5✓

-2<<2 = -8

$$\begin{array}{r} 2 \overline{)8} \\ 2 \overline{)4 \ - 0} \\ 2 \overline{)2 \ - 0} \\ \hline 1 \ - 0 \end{array}$$

$8 = 0000\ 0000\ 0000\ 1000$

$1^{\sim} = 1111\ 1111\ 1111\ 0111$

$2^{\sim} = 0000\ 0000\ 0000\ 0001$

$$\begin{array}{r} & & & 111 \\ & & & \hline 1111 & 1111 & 1111 & 1000 \\ & f & f & f & 8 \end{array}$$

Finding no of conversion characters in scanf():

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The terminal window title bar reads "TC" and the menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom of the window shows "Line 8 Col 17 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the terminal window is:

```
#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, c=%d",a,b,c);
getch();
}
```

The terminal window also displays the system taskbar at the bottom, which includes icons for various applications like File Explorer, Control Panel, and Device Manager. The taskbar shows the date and time as "28-Oct-24" and "10:04 AM".

Controlling inputs in scanf():

The screenshot shows the Turbo C++ IDE interface. The code editor window 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();
}
```

The command window below the editor shows the execution of the program:

```
Enter a value 9
Enter b value 5
a=9, b=5_
```

The taskbar at the bottom of the screen displays various application icons, and the system tray shows the date and time as 28-Oct-24 10:05 AM.

```
TC
Enter a value 6 8
Enter b value a=6, b=8_
```



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



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

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 indicates Line 9, Col 12, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#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();
}
```

The terminal window below shows the output of the program. It prompts the user to enter values for 'a' and 'b', then displays the swapped values 'a=3, b=7'. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:08 AM on 28-Oct-24.

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 indicates Line 9, Col 13, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#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();
}
```

The terminal window below shows the output of the program:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
< > TC
Enter a value 4 6
Enter b value 0
a=4, b=0_
```

The image shows a Windows desktop environment with a terminal window and a code editor.

Terminal Window (Top):

```
Enter a value 1 2 3 4 5
Enter b value 9
a=1, b=9_
```

Code Editor (Bottom):

```
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 19 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
char b;
clrscr();
printf("Enter an integer value");
scanf("%d",&a);
printf("Enter a character value ");
scanf("%c",&b);
printf("a=%d, b=%c",a,b);
getch();
}
```

System Status Bar:

10:09 AM 28-Oct-24

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:11 AM 28-Oct-24

The image shows a Windows operating system interface with three main components. At the top is a black terminal window titled "TC" with white text. It displays two lines of input: "Enter an integer value97" and "Enter a character value a=97, b=". Below this terminal window are two identical desktop windows. Each desktop window has a yellow taskbar at the bottom. On the taskbar, there are several icons including the Start button, File Explorer, Task View, and various application icons like DEV, zm, Google Chrome, and Microsoft Edge. The desktop windows also have the title "TC" and show the date "28-Oct-24" and time "10:11 AM" in the top right corner. The overall layout suggests a multitasking or testing environment where multiple instances of the terminal application are running simultaneously.

The screenshot shows the Turbo C IDE interface. The code in the editor is:

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

The output window displays the following interaction:

```
Enter an integer value3
Enter a character value y
a=3, b=y_
```

The status bar at the bottom shows the date and time as 28-Oct-24 and 10:14 AM.

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run. The program prompts the user for an integer value and a character value, then prints them back. The terminal window is titled 'TC' and has a menu bar with options like File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom of the window shows the current line (Line 10), column (Col 12), and file path (E:9AM.C). The desktop background is black, and the taskbar at the bottom shows various pinned icons.

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

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter an integer value4
Enter a character value b
a=4, b=b

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window is titled 'TC' and has a menu bar with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom of the window displays 'Line 11 Col 19 Insert Indent Tab Fill Unindent * E:9AM.C'. The code inside the window is:

```
#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();
}
```

The terminal window also displays the system tray icons and the taskbar at the bottom of the screen.

TC

```
Enter a 2 digit value247
Enter a 3 digit value 12345
a=247, b=12345_
```

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();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:18 AM 28-Oct-24

10:20 AM 28-Oct-24

TC

```
Enter a 2 digit value34
Enter a 3 digit value 567
a=34, b=567_
```

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();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:20 AM 28-Oct-24

```
TC
Enter a 2 digit value123456
Enter a 3 digit value a=12, b=345_
```

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 indicates Line 9, Col 12, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#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();
}
```

The terminal window below shows the output of the program:

```
Enter a 2 digit value123456
Enter a 3 digit value 123456
a=12, b=123_
```

A screenshot of a Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window title bar includes "File Edit Run Compile Project Options Debug Break/watch" and status information "Line 7 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

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

The terminal window displays the output of the program: "Hi2 8". The desktop taskbar at the bottom shows various pinned icons, including a browser, file explorer, and system tray icons. The system tray shows the date and time as "10:26 AM 28-Oct-24".

The image shows a screenshot of a Windows desktop environment. At the top, there is a taskbar with various icons, including a Start button, File Explorer, Task View, and several application icons. The system tray on the right shows the date as 28-Oct-24 and the time as 10:28 AM.

The main window is a terminal or code editor titled "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom of the window displays "Line 6 Col 48 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("%d",printf("Good morning"));
    getch();
}
```

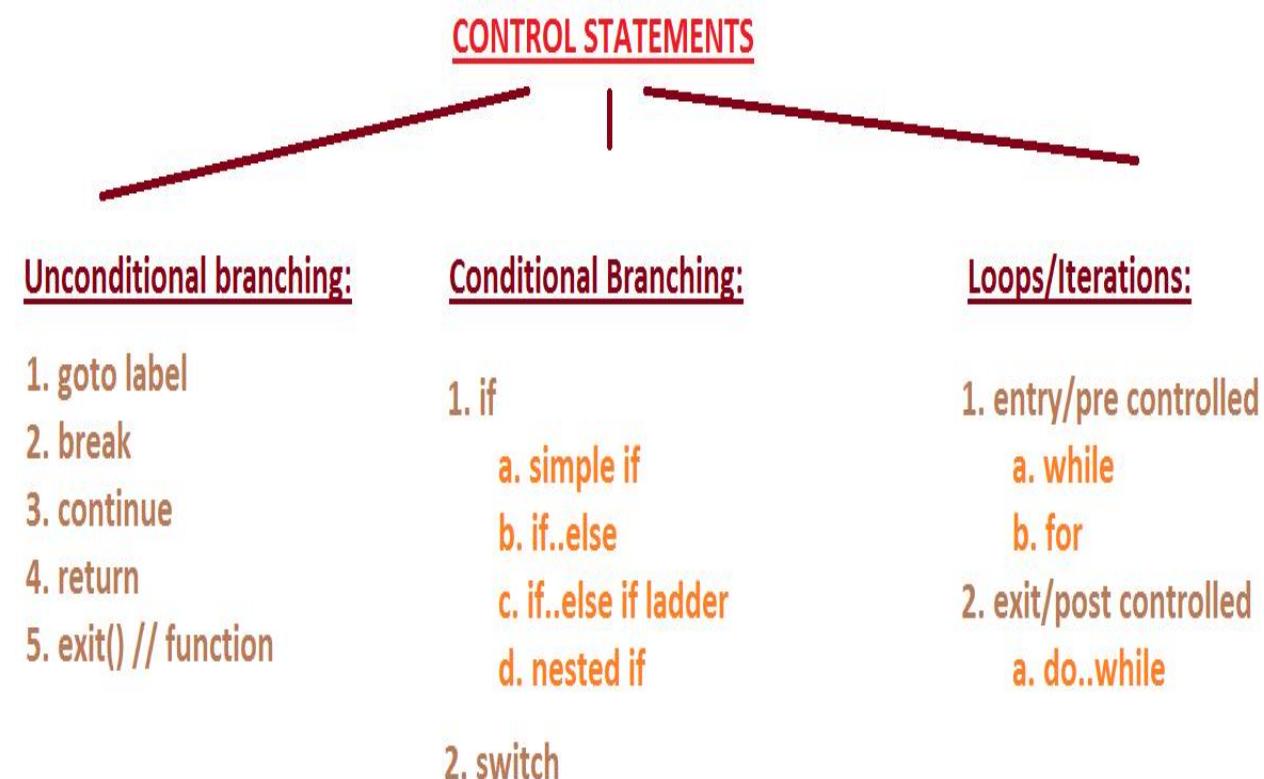
The terminal window shows the output of the program:

```
Good morning122
```

CONTROL STATEMENTS / CONTROL STRUCTURES

They are used to control the program execution order.

In c we are using the following control statements.



goto label:

It is used to transfer program execution from one place to another place [label].

In this process it is jumping from one area to another without any condition. Hence it is also called **unconditional** jumping statement.

Syntax:



Here **goto** is a keyword.

Label is an identifier is used to identify the area[line].

Every label should be end with : **(colon)**

Keywords not allowed in labels i.e. label should be user defined.

Duplicate labels not allowed.

There is no space between go and to.

Label naming rules are similar to the identifier rules.

Note: goto label working style is similar to loops some times.

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The main window displays a C program with various labels (a, b, c) and a getch() call at the end. The status bar indicates Line 15, Col 6, and E:9AM.C. The output window below shows the program's execution: "good morning", "good evening", and "good night".

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
goto a;
c:
puts("good night"); goto last;
b:
puts("good evening");
goto c;
a:
puts("good morning");
goto b;
Last:
getch();
}
```

Watch

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM SC

good morning
good evening
good night

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The status bar at the top indicates Line 8, Col 37, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
goto a;
c:
puts("good night"); getch(); return;_
b:
puts("good evening");
goto c;
a:
puts("good morning");
goto b;
}
```

The output window below the editor shows the results of the program's execution:

```
good morning
good evening
good night
```

The system tray at the bottom of the screen displays various icons, and the taskbar shows several open applications including a browser, file explorer, and development tools.

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and Edit. The main window displays a C program:

```
Line 3      Col 9      Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
#include<stdlib.h> /* #include<process.h> */
void main()
{
clrscr();
goto a;
c:
puts("good night"); getch(); exit(0);
b:
puts("good evening");
goto c;
a:
puts("good morning");
goto b;
}
```

The status bar at the bottom shows the text "good morning", "good evening", and "good night". The system tray indicates the date as 28-Oct-24 and the time as 10:49 AM.

The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. Below it is a terminal window titled 'TC' with the following code:

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
abc:
textcolor(random(16)); /* 0-15 */
textbackground(random(16));
cprintf("Kishore");
goto abc;
}
```

The terminal window has a dark background and displays the word "Kishore" in a variety of colors (red, green, blue, yellow, purple, etc.) in a repeating pattern across the screen. The status bar at the bottom of the terminal window shows the date and time as 9:34 AM 29-Oct-24.

If:

if:

It is a decision making statement.

It is a keyword is used to check the given condition / expression is true or false.

Note: In c other than 0 any thing is 1 i.e. true.

C provides 4 type of if statements.

1. Simple if
2. If..else
3. If..else if / ladder if
4. Nested if

Simple if:

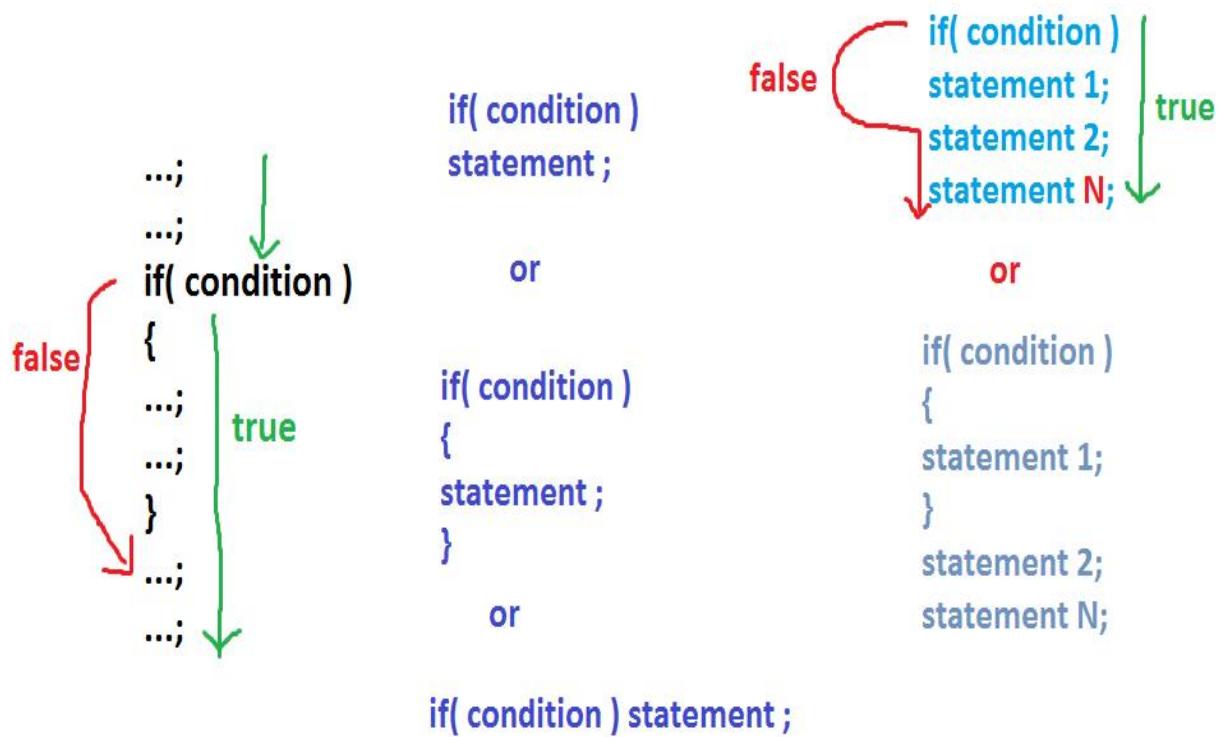
When the program is having only one option / condition then go for simple if.

if condition true the statements in if block { } are executed and later outside statements also executed.

If condition false only the outside statements are executed.

Note: When single statements is there { } are optional.

Syntax:



```
File Edit Run Compile Project Options Debug Break/watch  
Error: Expression syntax in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
< >  
Windows File Explorer Task View DEV ZM Google File Open Save Paint Word Excel TC  
File Edit Run Compile Project Options Debug Break/watch  
Error: Expression syntax in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( if( 5>=5 ) )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* Error */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
< >  
Windows File Explorer Task View DEV ZM Google File Open Save Paint Word Excel TC  
10:19 AM  
29-Oct-24
```

```
File Edit Run Compile Project Options Debug Break/watch  
Error: Undefined symbol 'a' in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( a )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* Error */
```

```
File Edit Run Compile Project Options Debug Break/watch  
Error: Illegal use of floating point in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( 5.0 % 2.0 )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* Error */
```

```
File Edit Run Compile Project Options Debug Break/watch  
Error: Undefined symbol 'true' in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( true )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* Error */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
Line 15 Col 5 Insert Indent Tab Fill Unindent * E:9AM.C  
File Edit Run Compile Project Options Debug Break/watch  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
int true = 0;  
clrscr();  
if( true )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* c_ */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
File Edit Run Compile Project Options Debug Break/watch  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
int c_ = 0;  
clrscr();  
if( c_ )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
int true = 0.1;
clrscr();
if( true )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
/* c */
```



```
#include<stdio.h>
#include<conio.h>
void main()
{
float true = 0.1;
clrscr();
if( true )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
/* abc */
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
int true = 'x';
clrscr();
if( true )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
/* abc */
```

A screenshot of a Microsoft Windows operating system desktop. In the center is a window titled "TC" which is a TURBO C++ integrated development environment. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". Below the menu bar, status information shows "Line 14" and "Col 4". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 0 )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
/* c */
```

The window has a dark blue background. At the bottom of the screen is the Windows taskbar, which includes icons for various applications like File Explorer, Control Panel, and Device Manager. The system tray shows the date and time as "29-Oct-24" and "10:27 AM".

```
File Edit Run Compile Project Options Debug Break/watch  
Error: Division by zero in function main  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( 5%0 )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* Error */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
File Edit Run Compile Project Options Debug Break/watch  
Line 14 Col 5 Insert Indent Tab Fill Unindent * E:9AM.C  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( 'a'/'b' )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* c_ */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM  
File Edit Run Compile Project Options Debug Break/watch  
Line 14 Col 5 Insert Indent Tab Fill Unindent * E:9AM.C  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
clrscr();  
if( 'a'/'b' )  
{  
printf("a");  
printf("b");  
}  
printf("c");  
getch();  
}  
/* c_ */
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5/6.0 )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
/* abc */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

File Edit Run Compile Project Options Debug Break/watch

Line 14 Col 6 Insert Indent Tab Fill Unindent * E:9AM.C

TC

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

File Edit Run Compile Project Options Debug Break/watch

Line 15 Col 11 Insert Indent Tab Fill Unindent * E:9AM.C

TC

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

File Edit Run Compile Project Options Debug Break/watch

Line 15 Col 11 Insert Indent Tab Fill Unindent * E:9AM.C

TC

A screenshot of a Microsoft Windows operating system desktop. In the center is a code editor window titled "TC" (Turbo C) with the file name "E:9AM.C". The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows "Line 14 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

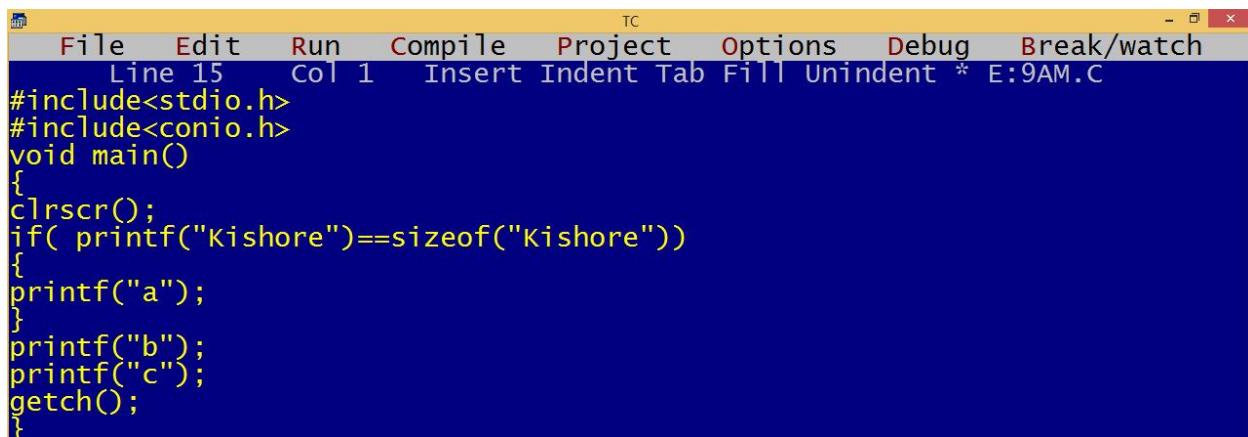
```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5>5 )
{
printf("a");
printf("b");
printf("c");
}
getch();
}
/* Blank screen_*/
```

The taskbar at the bottom contains icons for various applications including Windows File Explorer, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, and File Explorer. The system tray shows the date and time as 10:34 AM, 29-Oct-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5>5 )
printf("a");
printf("b");
printf("c");
getch();
}
/* bc */
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5>5 )
{
printf("a");
}
printf("b");
printf("c");
getch();
}
/* bc */
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5>5 )
{
printf("a");
}
printf("b");
printf("c");
getch();
}
/* bc */
```



A screenshot of 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 shows "Line 15 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( printf("Kishore")==sizeof("Kishore"))
{
printf("a");
}
printf("b");
printf("c");
getch();
}
```

Output: Kishorebc

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( printf("Kishore") < printf("Naidu"))
{
printf("a");
printf("b");
}
printf("c");
getch();
}
```

Below the terminal window, the Windows taskbar is visible, showing various pinned icons and the system tray. The system tray displays the date and time as "10:42 AM 29-Oct-24".

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 top indicates Line 14, Col 1, TC, and E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( printf("Kishore") < "Naidu" )
{
printf("a");
printf("b");
}
printf("c");
getch();
}
```

The code has a syntax error: the condition in the if statement is incorrect. Instead of using the less than operator (<), it uses the assignment operator (=). When run, the program prints "a" and "b" but does not print "c".

Print kishore without using ;

TC

File Edit Run Compile Project Options Debug Break/watch

Error: Statement missing ; in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
printf("Kishore");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

File Edit Run Compile Project Options Debug Break/watch

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

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if(strcmp("Kishore"))
{
}
getch();_
```

Message

- Compiling E:\TC\9AM.C:
- Linking E:\TC\9AM.EXE:

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:45 AM
29-Oct-24

File Edit Run Compile Project Options Debug Break/watch

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

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if(strcmp("Kishore"))
{
}
getch();_
```

Message

- Compiling E:\TC\9AM.C:
- Linking E:\TC\9AM.EXE:

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:47 AM
29-Oct-24

Kishore_

```
File Edit Run Compile Project Options Debug Break/watch Edit
Error: Statement missing ; in function main
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if_printf("Kishore")
}_
```

Message

Compiling E:\TC\9AM.C:
• Error E:\TC\9AM.C 7: Statement missing ; in function main

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Find the absolute value of given no[Always +Ve].

if($n < 0$) $n = -n;$

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 top indicates Line 10, Col 9, and the file E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter the no "); scanf("%d",&n);
if(n<0)n=-n;
printf("Absolute value = %d",n);
getch();
}
```

The terminal window below shows the output of the program. It prompts the user to enter a number, receives -4, calculates its absolute value (4), and prints it out.

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
< > TC
Enter the no -4
Absolute value = 4
```

The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. In the center is a terminal window titled "TC" with a black background. The window displays the following text:
Enter the no 4
Absolute value = 4

Using abs():

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The terminal window title bar reads "TC" and the menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". Status information at the top right says "Line 9 Col 36 Insert Indent Tab Fill Unindent * E:9AM.C".

The code in the terminal window is:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int n;
clrscr();
printf("Enter the no "); scanf("%d",&n);
printf("Absolute value = %d",abs(n));
getch();
}
```

The terminal window also displays the output of the program:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
< >
Windows Taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Word, Pictures, TC
9:26 AM 30-Oct-24
Enter the no -9
Absolute value = 9
```

```
Enter the no 9
Absolute value = 9
```

Write a c program to print 1..10 no's without using loop:

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays a C program. The code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i=1;
    clrscr();
    start:
    if(i<=10)
    {
        printf("%d\n",i);
        i++;
        goto start;
    }
    getch();
}
```

The terminal window also shows line numbers 1 through 10 on the left side. The taskbar at the bottom of the screen contains several icons, including the Start button, File Explorer, Task View, Control Panel, ZM, Google Chrome, Microsoft Edge, Paint, File Explorer, and File Explorer again. The system tray shows the date and time as 9:29 AM 30-Oct-24.

```
i=1;  
start:  
if(i<=10)  
{  
    p(i); ✓  
    i++; ✓  
    goto start;  
}
```

$\frac{0}{i <= 10}$

1 ✓
2 ✓
3
-
10 ✓
11

Finding lower case alphabet or not?

The image shows a screenshot of a Windows operating system desktop. In the center is a terminal window titled "TC" with a dark blue background. The window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 8 Col 49 Insert Indent Tab Fill Unindent * E:9AM.C". The main area of the terminal contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='a' && ch<='z' ) puts("Lower case char");
getch();
}
```

Below the terminal window, the Windows taskbar is visible, showing various pinned icons like File Explorer, Edge, and Control Panel. The system tray in the bottom right corner shows the date and time as "9:32 AM 30-Oct-24".

TC

Enter a character B

```
File Edit Run Compile Project Options Debug Break/watch
Line 9 Col 25 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='a' && ch<='z') puts("Lower case char");
if(!(ch>='a' && ch<='z')) puts("Not a lower case char");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

TC

9:33 AM
30-Oct-24

Windows Taskbar icons: DEV, zm, Google Chrome, File Explorer, Paint, Notepad, FileZilla, Task View

9:34 AM
30-Oct-24

```
TC
Enter a character h
Lower case char

Enter a character G
Not a lower case char
```

The image shows two screenshots of a Windows desktop environment. Both screenshots feature a dark-themed window titled 'TC' with a yellow header bar. The first screenshot displays the text 'Enter a character h' followed by 'Lower case char'. The second screenshot displays the text 'Enter a character G' followed by 'Not a lower case char'. Below these windows is a standard Windows taskbar. The taskbar includes several pinned icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, OneNote, and File Explorer again. On the right side of the taskbar, there is a system tray with icons for battery status, volume, and network. The system tray also shows the date and time as '9:35 AM 30-Oct-24'. In the bottom right corner of the second screenshot, there is a tooltip indicating 'Speakers/Headphones: 100%'.

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 indicates Line 9, Col 20, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

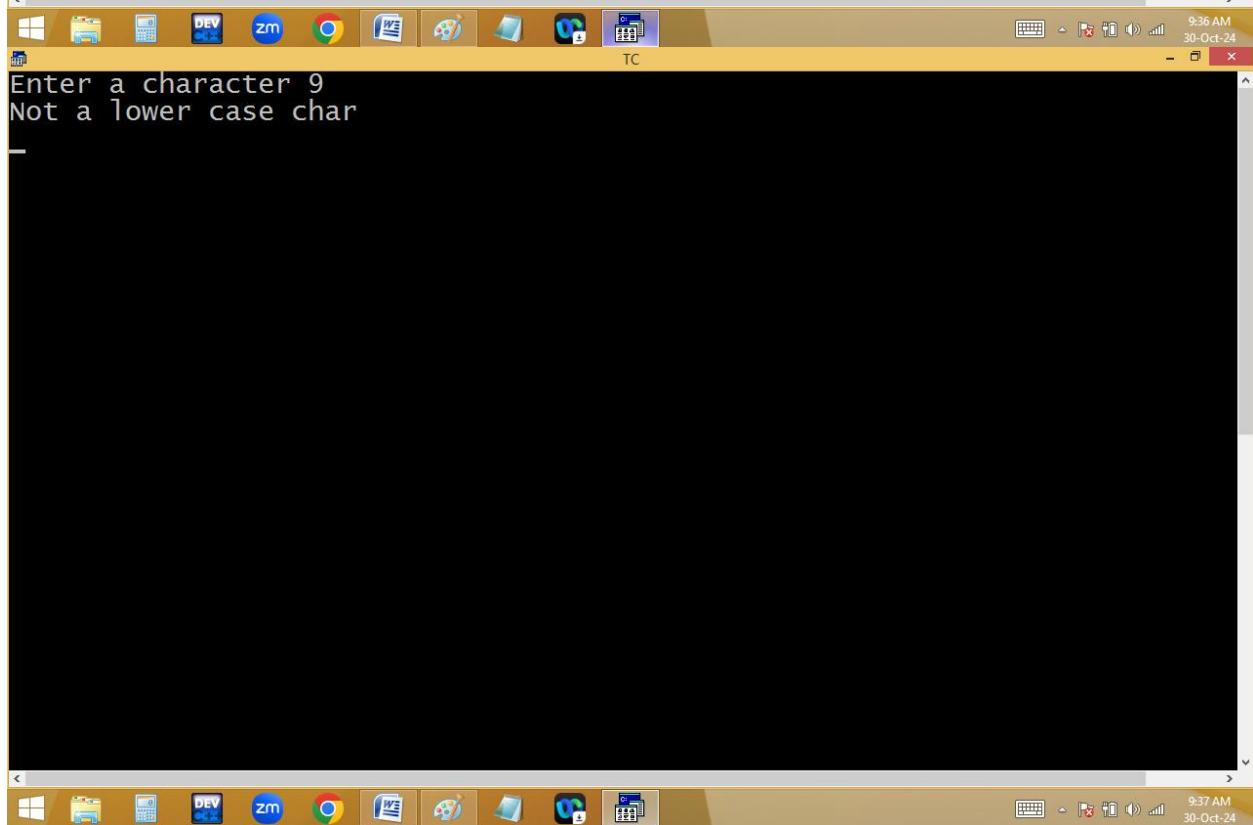
```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='a' && ch<='z' ) puts("Lower case char");
if(ch<'a' || ch>'z') puts("Not a lower case char");
getch();
}
```

The output window shows the following interaction:

```
Enter a character D
Not a lower case char
```

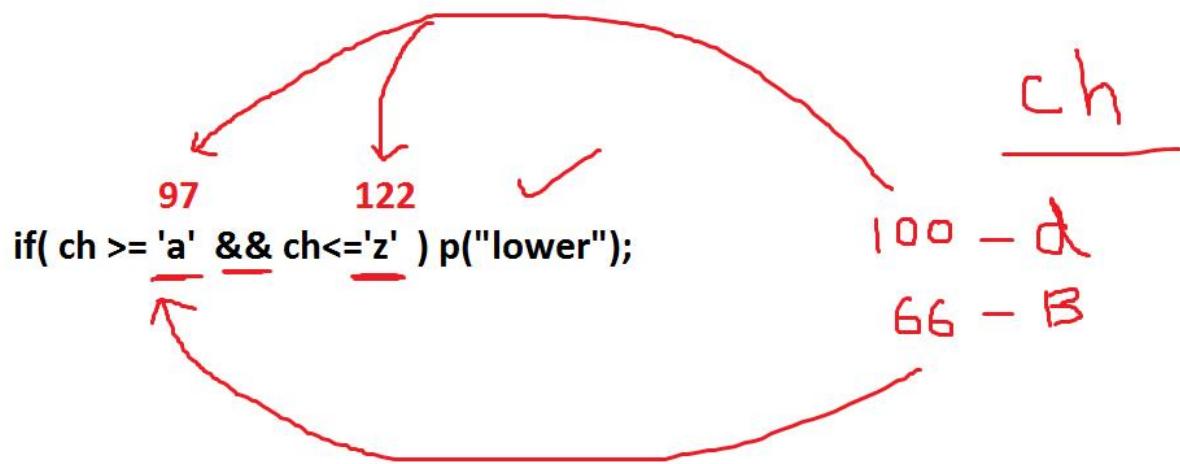
The system tray at the bottom right shows the date and time as 9:36 AM 30-Oct-24.

```
TC
Enter a character b
Lower case char
-
Enter a character 9
Not a lower case char
-
```

The image shows a Windows operating system desktop environment with two terminal windows open. Both windows have a yellow title bar labeled 'TC'. The first window displays the text 'Enter a character b' followed by 'Lower case char' and a blank line. The second window displays 'Enter a character 9' followed by 'Not a lower case char' and a blank line. Below the windows is a standard Windows taskbar. It features several pinned application icons, including File Explorer, Control Panel, Task View, ZM, Google Chrome, Microsoft Edge, Paint, File Explorer again, and File Explorer once more. On the right side of the taskbar, there is a system tray with icons for keyboard, mouse, battery, signal strength, and date/time (9:36 AM, 30-Oct-24). The background of the desktop is a light blue color.

TC

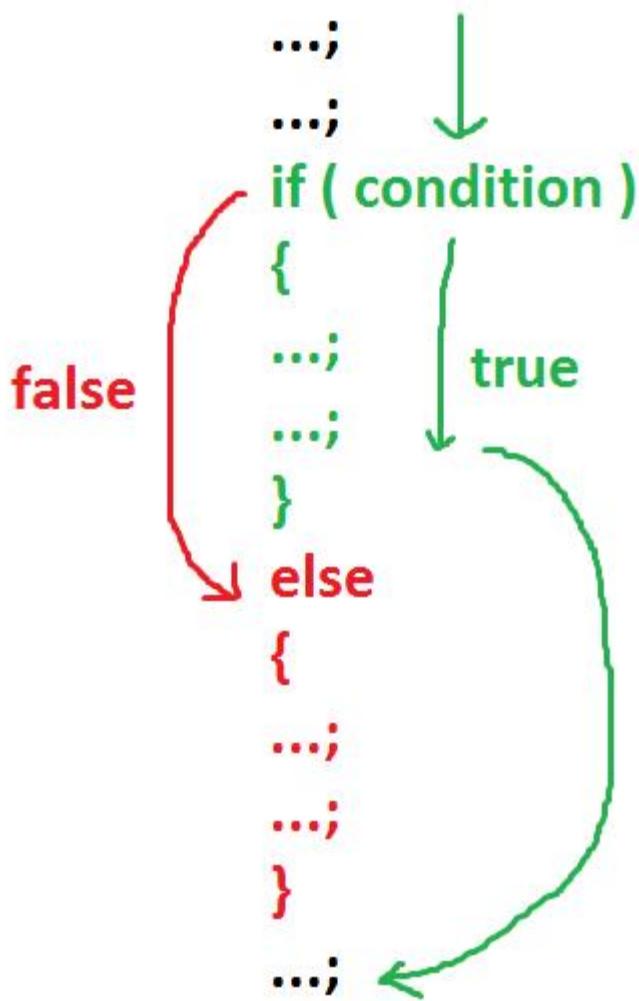
```
Enter a character *
Not a lower case char
```



if....else: When the program is having two options and we have to select any one then go for if..else.

if condition is true then statements in if block {} are executed and else not considered.

If condition false then statements in else part executed. Else doesn't require any condition.



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 top indicates Line 9, Col 5, and the file E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='a' && ch<='z' ) puts("Lower case char");
else puts("Not a lower case char");
getch();
}
```

The output window below the editor shows the results of running the program. It prompts "Enter a character f" and then displays "Lower case char". The system tray at the bottom right shows the date and time as 9:38 AM 30-Oct-24.

The screenshot shows a terminal window titled "TC" with a black background and white text. It displays the following message:
Enter a character J
Not a lower case char

The window has a standard Windows-style title bar and a taskbar at the bottom with various icons.

Finding upper case char or not?

The screenshot shows a code editor window with a dark blue background and white text. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom shows "Line 9 Col 21 Insert Indent Tab Fill Unindent * E:9AM.C".

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='A' && ch<='Z' ) puts("Upper case char");
else puts("Not a Upper case char");
getch();
}
```

The status bar at the bottom also shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM.

```
TC
Enter a character H
Upper case char

Enter a character d
Not a Upper case char
```

The screenshot shows a Microsoft Windows desktop with a TURBO C++ IDE window open. The window has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows Line 8, Col 20, Insert, Indent, Tab, Fill, Unindent, and E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>=65 && ch<=90 ) puts("Upper case char");
else puts("Not a Upper case char");
getch();
}
```

The taskbar at the bottom shows various pinned icons, including a browser, file explorer, and development tools. The system tray shows the date and time as 9:46 AM, 30-Oct-24.

```
TC
Enter a character Z
Upper case char

Enter a character m
Not a Upper case char
```

TC

Enter a character Z

Upper case char

TC

Enter a character m

Not a Upper case char

Finding alphabet or not?

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>=65 && ch<=90 || ch>=97 && ch<=122 ) puts("It is an alphabet");
else puts("Not an Alphabet");
getch();
}
```

Below the code, the terminal window shows the output of the program:

```
Enter a character y
It is an alphabet
```

The desktop taskbar at the bottom of the screen contains several icons, including File Explorer, Task View, Start, Task Manager, and others. The system tray in the bottom right corner shows the date and time as "9:48 AM 30-Oct-24".

```
TC
Enter a character R
It is an alphabet

Enter a character 9
Not an Alphabet
```

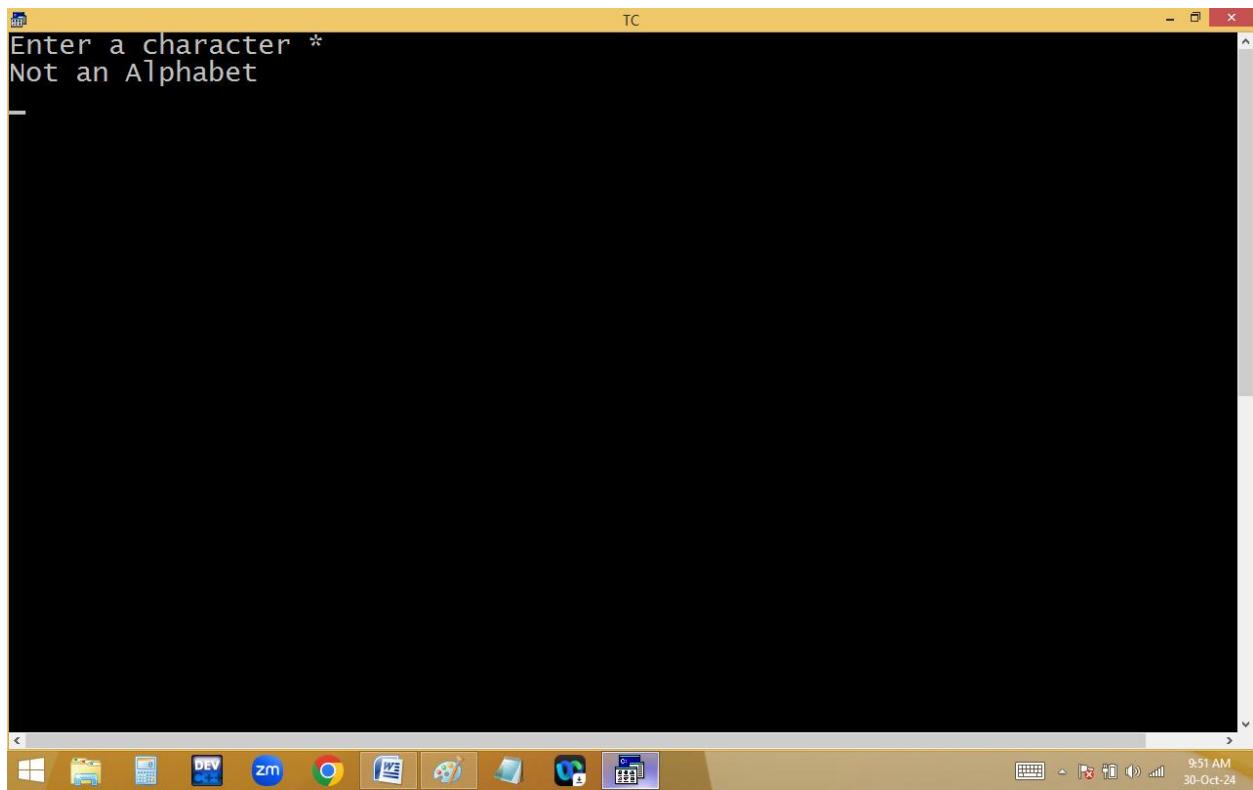
The image displays three separate Windows desktop sessions, each featuring a terminal window with a black background and white text. The top session shows the message 'Enter a character R' followed by 'It is an alphabet'. The middle session shows 'Enter a character 9' followed by 'Not an Alphabet'. Both sessions are titled 'TC'. The desktop environment includes a taskbar at the bottom with various icons and a system tray showing the date and time as 9:48 AM on 30-Oct-24.

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 8 Col 44 Insert Indent Tab Fill Unindent * E:9AM.C". The main area of the terminal contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter a character "); scanf("%c",&ch);
if(ch>='A' && ch<='Z' || ch>='a' && ch<='z') puts("It is an Alphabet");
else puts("Not an Alphabet");
getch();
}
```

When the program is run, it prompts the user to "Enter a character p". The user types "p" and presses Enter. The terminal then outputs "It is an Alphabet".

At the bottom of the screen, there is a taskbar with several icons, including the Start button, File Explorer, Task View, Control Panel, ZM, Google Chrome, FileZilla, Paint, and File Manager. The system tray shows the date and time as "9:51 AM 30-Oct-24".



```
TC
Enter a character *
Not an Alphabet
```

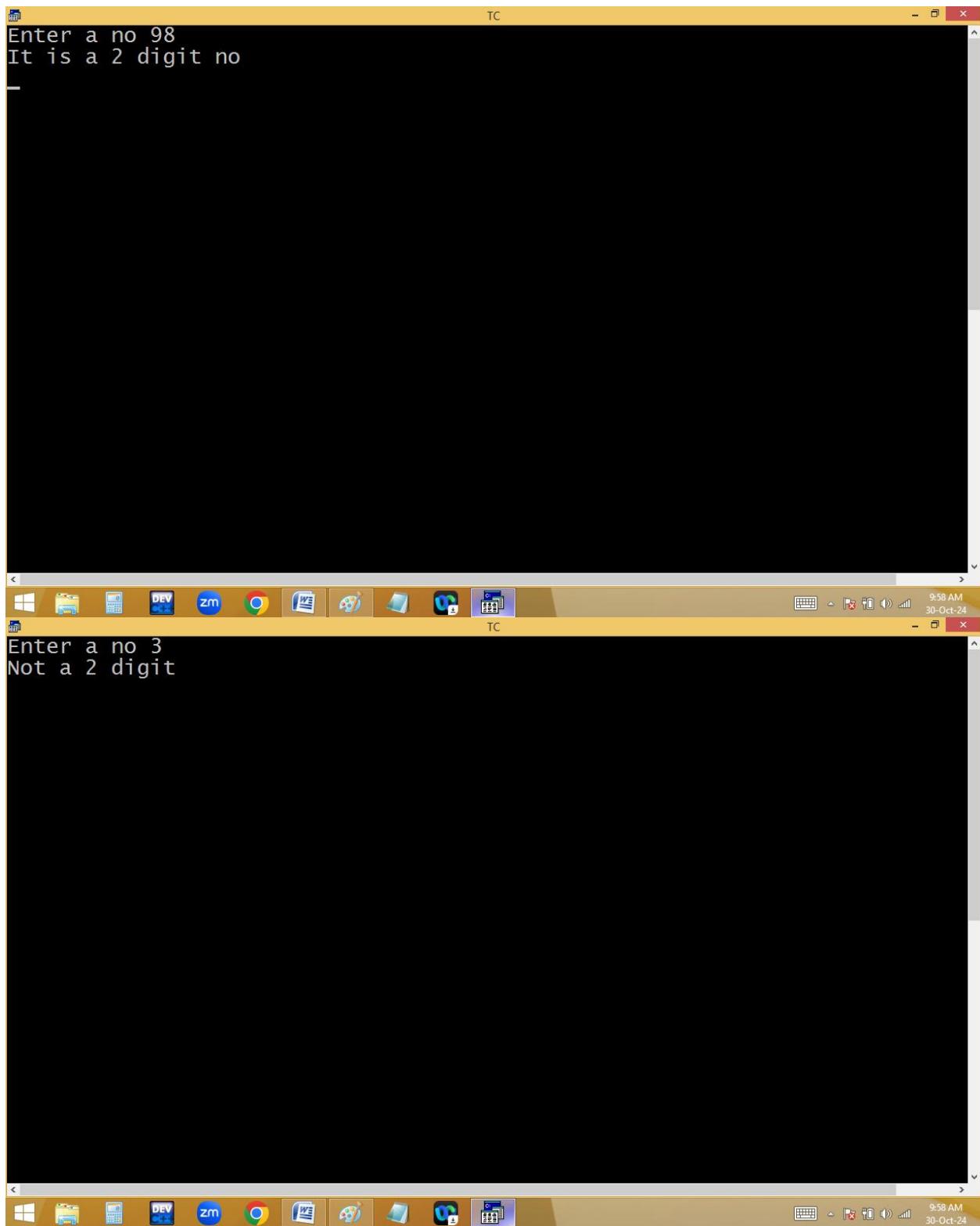
Finding 2 digit no or not?

The screenshot shows a Microsoft Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window title bar includes the menu bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch, Line 8, Col 38, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
if(n>=10 && n<=99 || n<=-10 && n>=-99) puts("It is a 2 digit no");
else puts("Not a 2 digit");
getch();
}
```

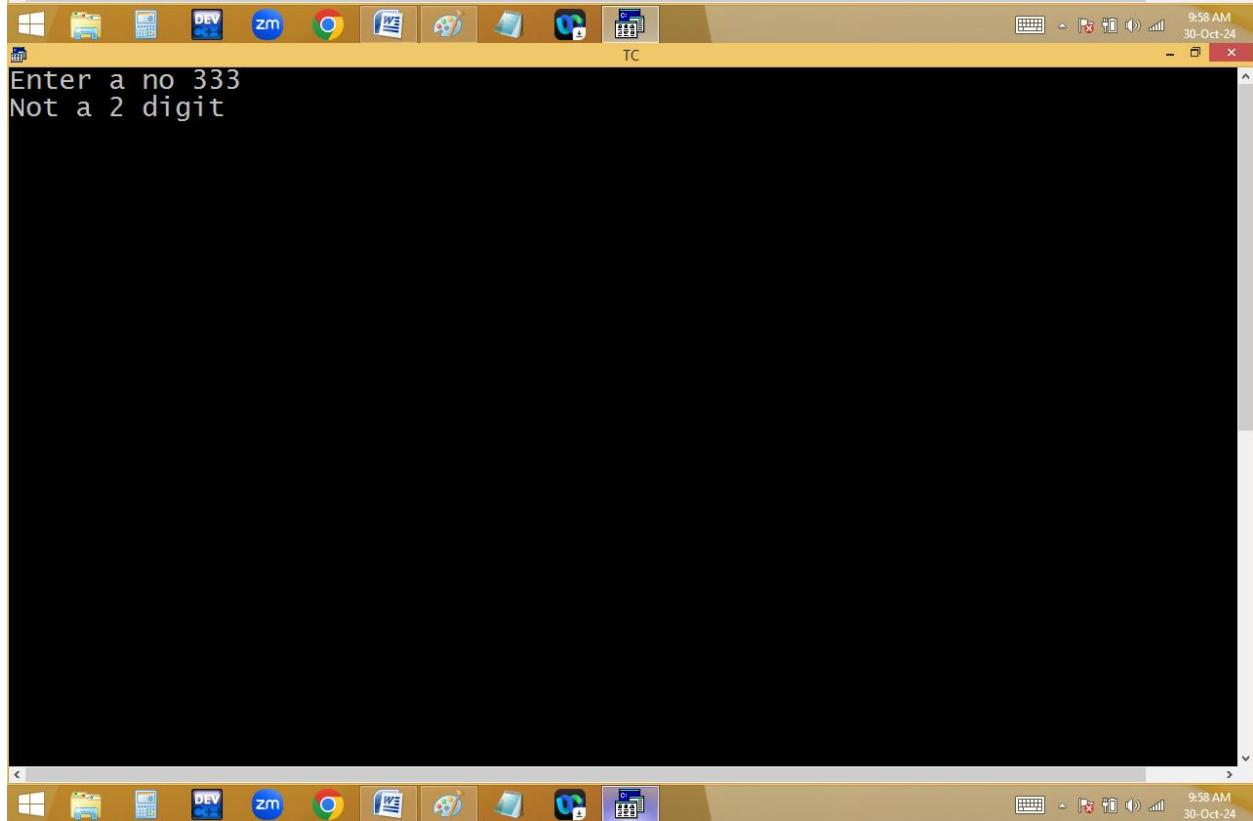
Below the terminal window, the Windows taskbar displays several icons for applications like File Explorer, Control Panel, and Internet Explorer. The system tray shows the date and time as 9:58 AM, 30-Oct-24.

```
TC
Enter a no 98
It is a 2 digit no
-
Enter a no 3
Not a 2 digit
```



The image shows a Windows desktop environment with three terminal windows open. The top window has a black background and displays the text "Enter a no 98" and "It is a 2 digit no". The bottom two windows have a light blue background and display the text "Enter a no 3" and "Not a 2 digit". The taskbar at the bottom of the screen shows various application icons, including File Explorer, Control Panel, Task View, ZM, Google Chrome, Microsoft Edge, Paint, and File Explorer again. The system tray in the bottom right corner shows the date and time as "9:58 AM 30-Oct-24".

```
TC
Enter a no -5
Not a 2 digit
-
Enter a no 333
Not a 2 digit
```

The image shows a Windows desktop environment with three identical windows stacked vertically. Each window has a title bar labeled 'TC'. The first window contains the text 'Enter a no -5' and 'Not a 2 digit'. The second window contains 'Enter a no 333' and 'Not a 2 digit'. The third window is empty. Below the windows is a standard Windows taskbar. It features several pinned icons: File Explorer (blue folder), File Manager (yellow folder), Task View (blue square with dots), DEV (blue square with white text), zm (blue square with white text), Google Chrome (orange square with white text), Microsoft Edge (light blue square with white text), Paint (red square with white text), and File Explorer again. On the right side of the taskbar, there is a system tray with icons for keyboard, mouse, battery, signal strength, and volume, along with the date and time '9:58 AM 30-Oct-24'.

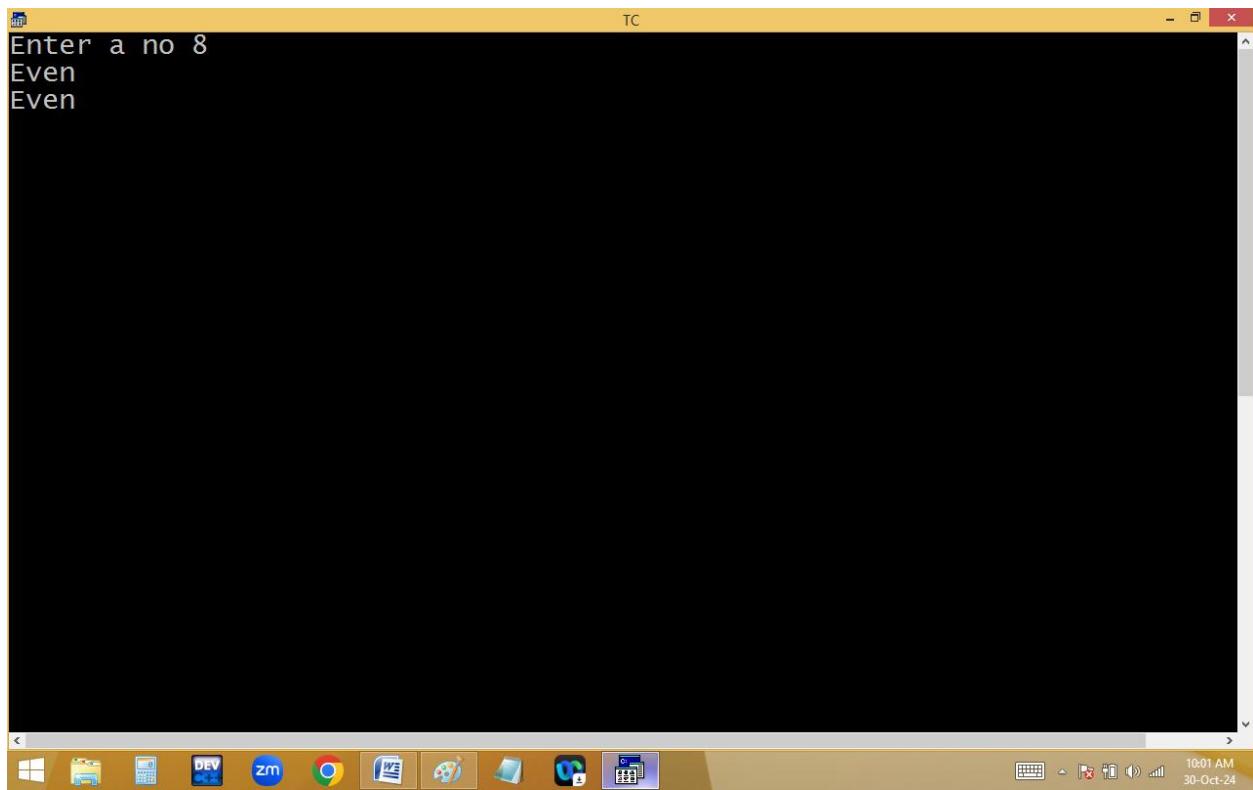
Finding even/odd:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program. The code uses standard input-output functions like `stdio.h` and `conio.h` to read a number from the user and determine if it is even or odd. The output shows that the program is running correctly, but there is a noticeable inconsistency where the word "Odd" appears twice in the output.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
if(n%2==0) puts("Even");else puts("Odd");
if(n%2)puts("Odd");else puts("Even");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter a no 9
Odd
Odd



TC

Enter a no 8

Even

Even

Without using %:

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 top indicates Line 8, Col 12, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
if(n/2*2==n) puts("Even");else puts("Odd");
getch();
}
```

The terminal window below shows the output of the program. The user enters "5" and the program outputs "Odd". The system tray at the bottom right shows the date and time as 10:01 AM 30-Oct-24.

```
Enter a no 6
Even
```

$6/2=3*2=6==6$ →
if($n/2 * 2 == n$) p("Even") ; else p("Odd");
 $7/2=3*2=6==7$ →

Without using arithmetic operators:

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 indicates Line 8, Col 5, TC, and E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
if((n&1)==0) puts("Even");else puts("Odd");
getch();
}
```

The terminal window below shows the execution of the program. It prompts "Enter a no 8" and outputs "Even". The system tray at the bottom right shows the date and time as 10:09 AM, 30-Oct-24.

```
TC
Enter a no 5
Odd
```

$$\begin{array}{r} 4 = 100 \\ 1 = 001 \\ \hline 000 = 0 \end{array}$$

$$\begin{array}{r} 2 \mid 4 \\ 2 \mid 2-0 \\ \hline 1-0 \end{array} \quad \begin{array}{r} 2 \mid 3 \\ 1-1 \end{array}$$

if(n&1 == 0) p(even); else p(odd);

$$\begin{array}{r} 3 = 11 \\ 1 = 01 \\ \hline 0 \mid 1 \end{array}$$

Finding leap year / common year:

The screenshot shows a Windows desktop environment with a TURBO C++ IDE window open. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom of the window shows "Line 8 Col 52 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n;
    clrscr();
    printf("Enter year no ");
    scanf("%d",&n);
    if(n%4==0) puts("Leap Year");
    else puts("Common Year");
    getch();
}
```

The window has a toolbar with various icons and a status bar at the bottom. The desktop background is black, and the taskbar at the bottom shows several pinned icons and the system clock.

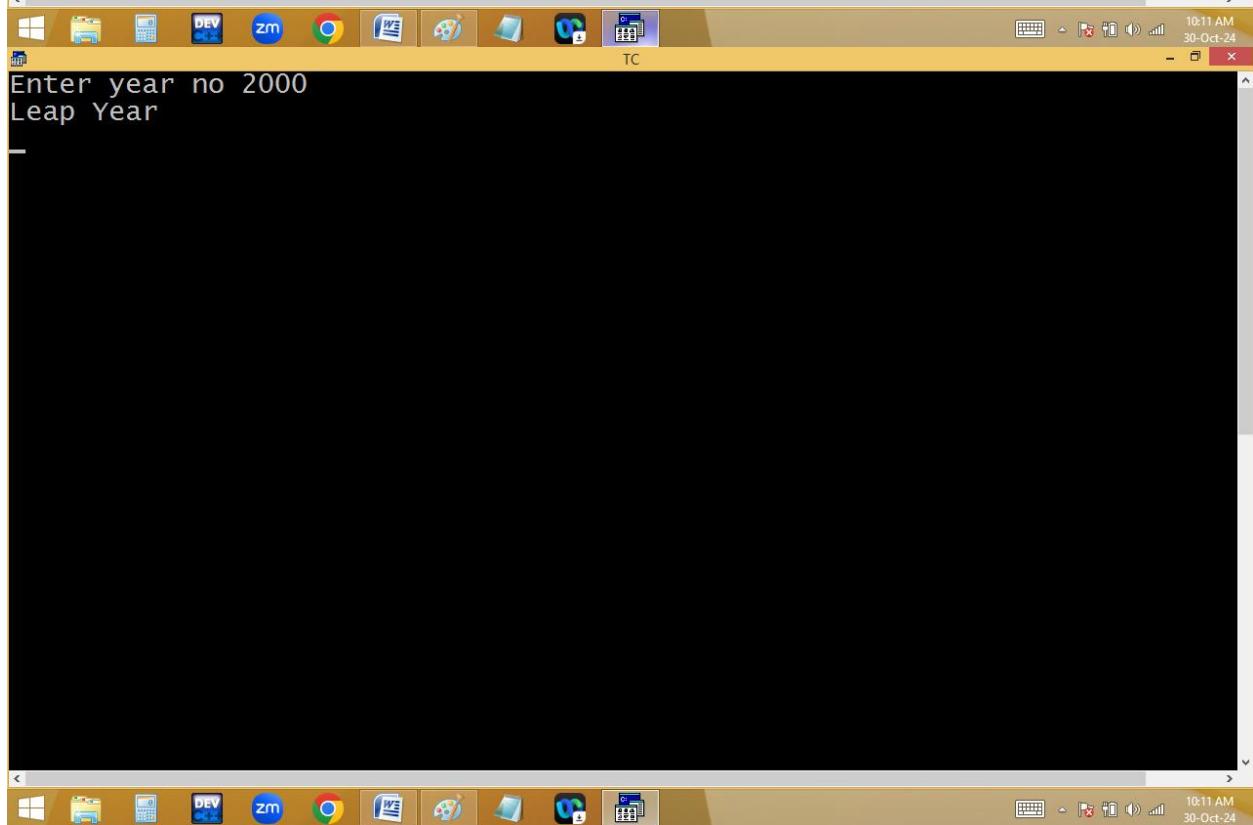
Output window content:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
```

```
Enter year no 2024
Leap Year
```

System tray icons include: DEV, zm, Google Chrome, FileZilla, Paint, Snipping Tool, Task View, and a battery icon. The system clock shows 10:11 AM on 30-Oct-24.

```
TC
Enter year no 2025
Common Year
-
Enter year no 2000
Leap Year
-
```

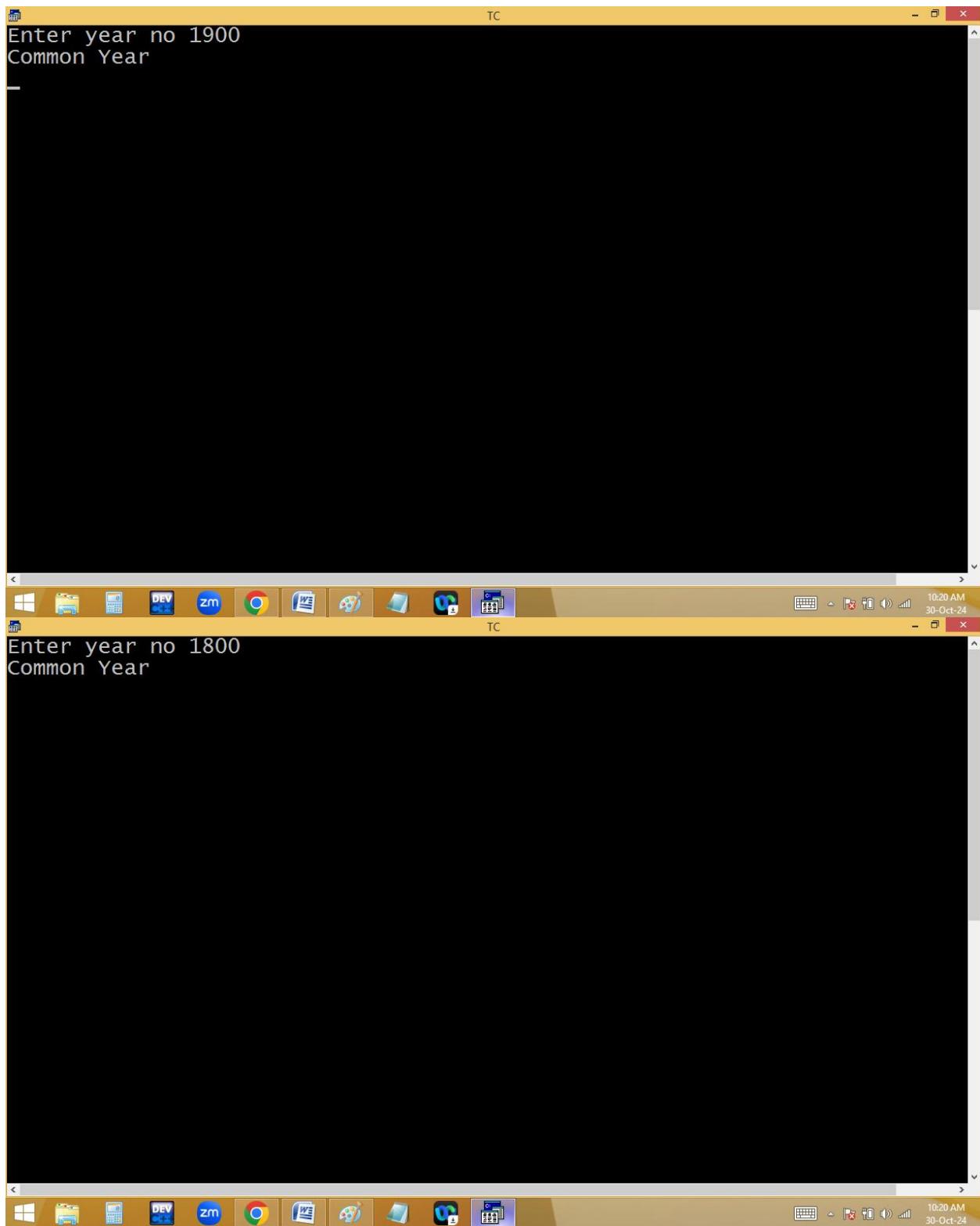
The image shows two screenshots of a Windows desktop environment. Both screenshots feature a dark-themed window titled 'TC' with a black background. The first screenshot displays the text 'Enter year no 2025' followed by 'Common Year'. The second screenshot displays the text 'Enter year no 2000' followed by 'Leap Year'. Below each window is a standard Windows taskbar. The taskbar includes several pinned icons: a folder, a file, a calculator, a 'DEV' folder, a 'zm' application, a browser (Google Chrome), a Microsoft Word document, a Microsoft Paint icon, a Microsoft OneNote icon, and a Microsoft Excel icon. On the far right of the taskbar, the system tray shows the date and time as '10:11 AM 30-Oct-24'.

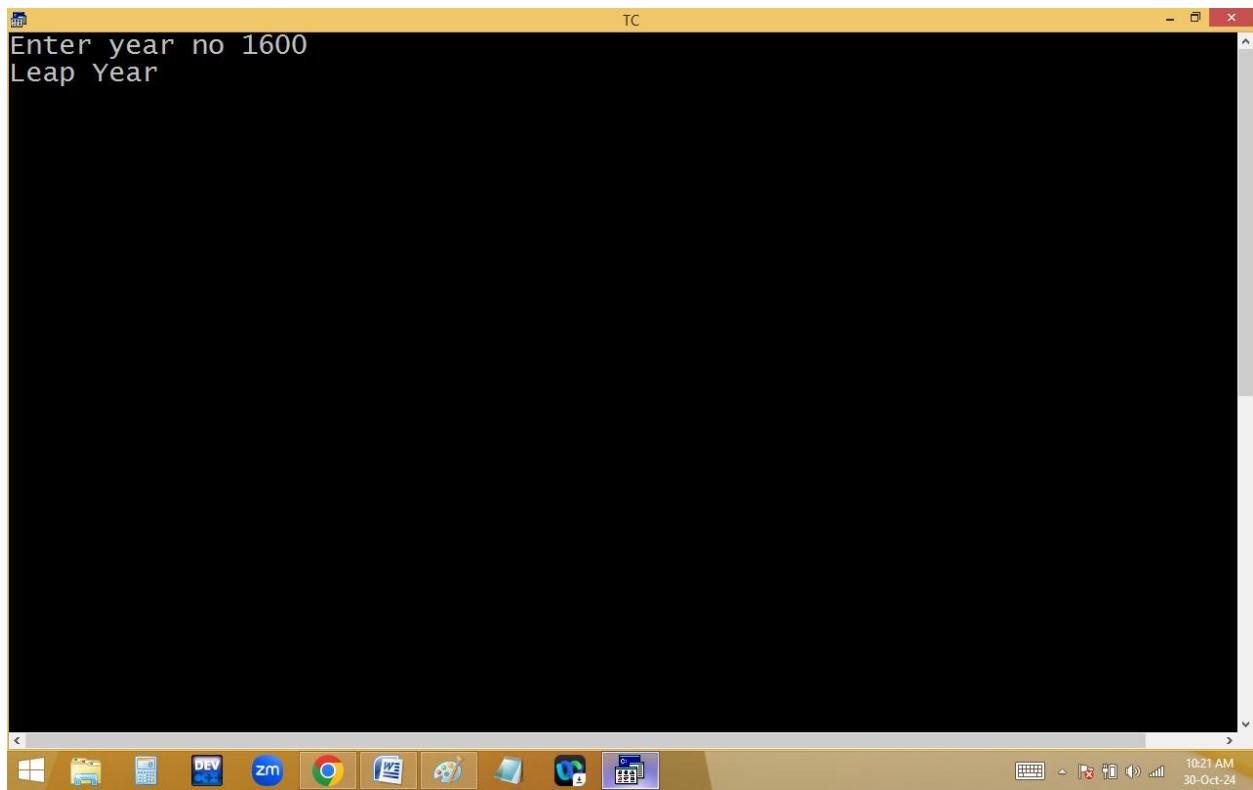
The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays a C program for determining if a year is a leap year. The code uses standard input (scanf) to get a year from the user and standard output (printf) to display the result. The terminal window also shows the system tray at the bottom, which includes icons for various applications like DEV, zm, and Google Chrome.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter year no ");
scanf("%d",&n);
if(n%4==0 && n%100!=0 || n%400==0) puts("Leap Year");
else puts("Common Year");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

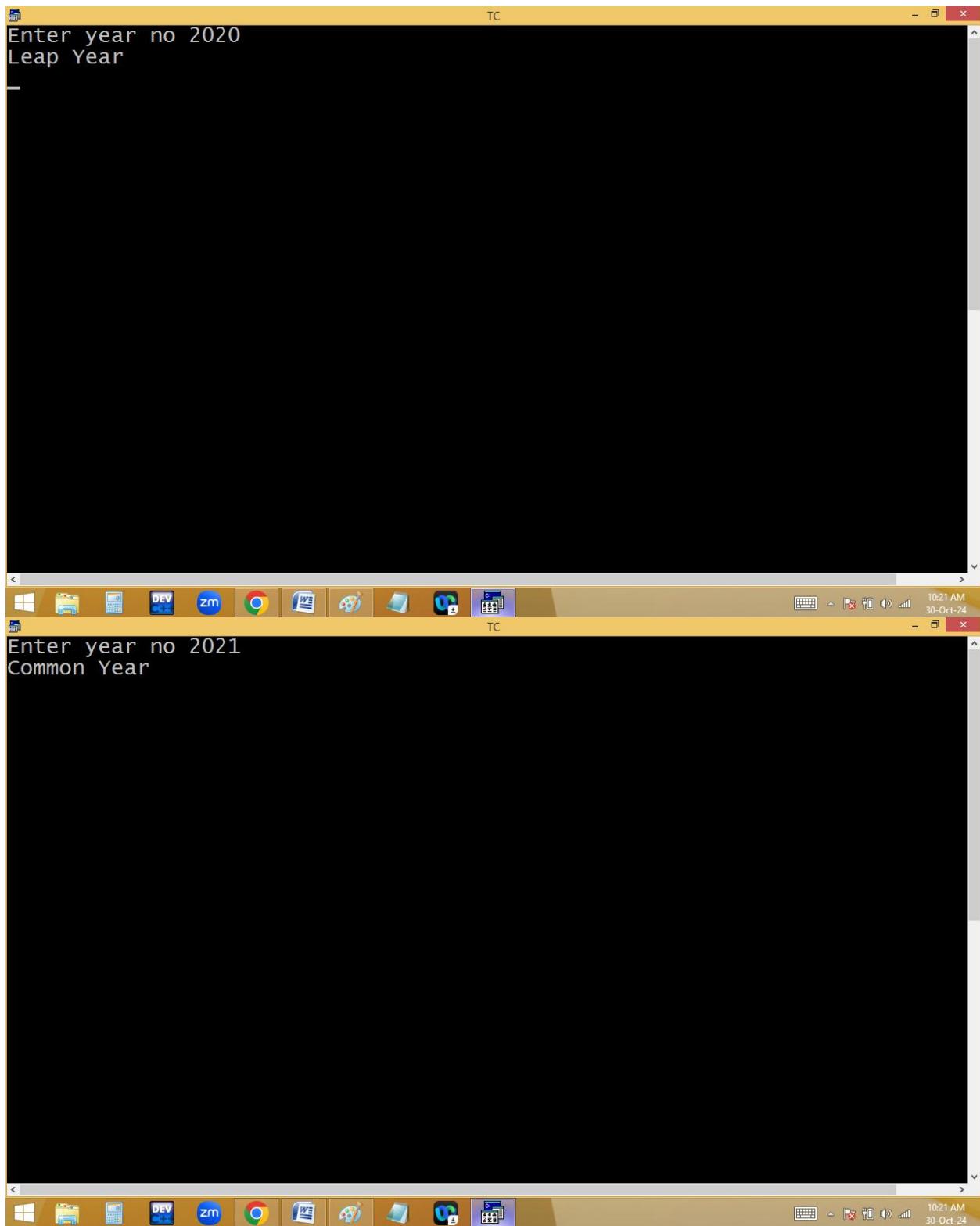
Enter year no 2000
Leap Year





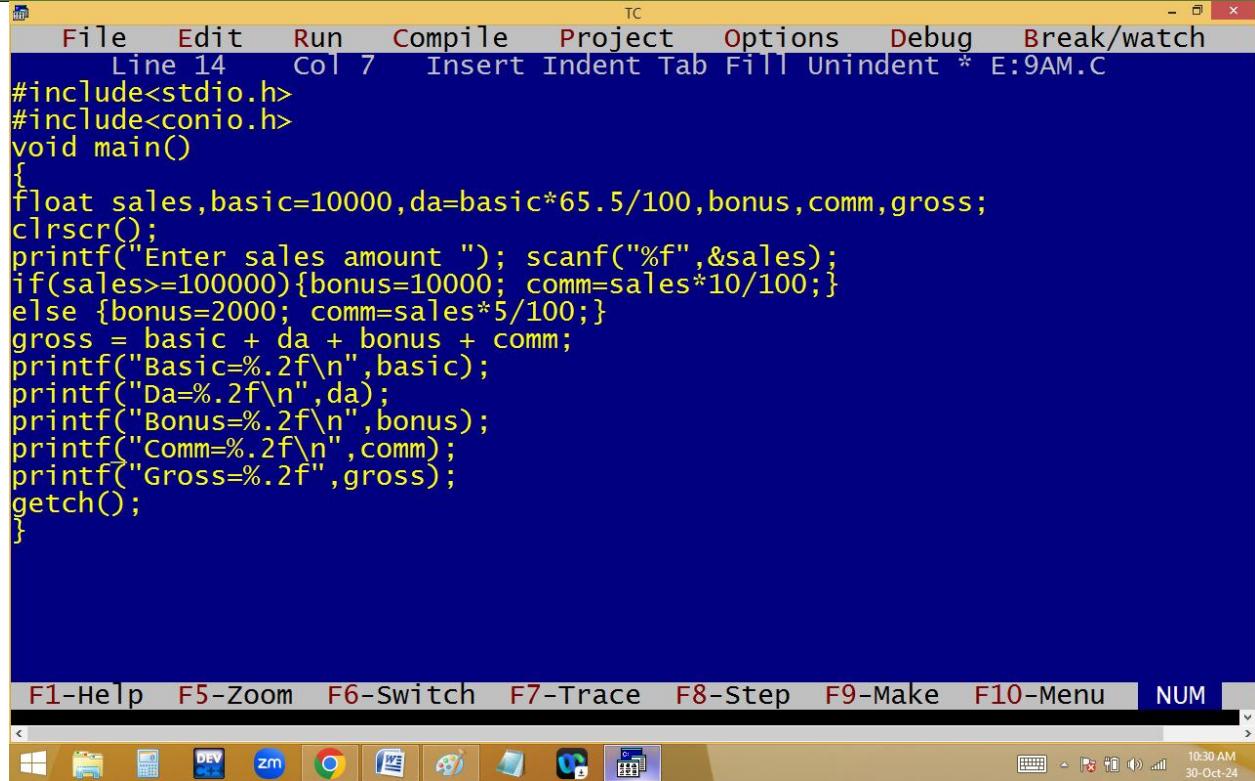
```
TC
Enter year no 2020
Leap Year

Enter year no 2021
Common Year
```



Finding salesman gross salary using below table.

$\text{sales} \geq 100000$	$\text{sales} < 100000$
Basic=10000	Basic=10000
Da=65.5% of basic	Da=65.5% of basic
Bonus=10000	Bonus=2000
Comm.=10% of sales	Comm.=5% of sales
Gross = Basic + da + bonus + commission	



The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the following C code:

```

TC
File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 7 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
float sales,basic=10000,da=basic*65.5/100,bonus,comm,gross;
clrscr();
printf("Enter sales amount "); scanf("%f",&sales);
if(sales>=100000){bonus=10000; comm=sales*10/100;}
else {bonus=2000; comm=sales*5/100;}
gross = basic + da + bonus + comm;
printf("Basic=% .2f\n",basic);
printf("Da=% .2f\n",da);
printf("Bonus=% .2f\n",bonus);
printf("Comm=% .2f\n",comm);
printf("Gross=% .2f",gross);
getch();
}

```

The terminal window also shows the menu bar with options like File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom indicates keyboard shortcuts (F1-Help, F5-Zoom, etc.) and the current date and time (10:30 AM, 30-Oct-24).

```
Enter sales amount 100000
Basic=10000.00
Da=6550.00
Bonus=10000.00
Comm=10000.00
Gross=36550.00

Enter sales amount 99999
Basic=10000.00
Da=6550.00
Bonus=2000.00
Comm=4999.95
Gross=23549.95
```

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Misplaced else in function main" is displayed at the top. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
printf("a");
printf("b");
else
printf("c");
printf("d");
getch();
}
```

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 indicates Line 16, Col 12, Insert, Indent Tab, Fill, Unindent, *, E:9AM.C. The code editor contains the following C code, which has been corrected from the previous screenshot:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
{
printf("a");
printf("b");
}
else
printf("c");
printf("d");
getch();
}/* abd */
```

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 indicates Line 16, Col 12, Insert, Indent Tab, Fill, Unindent, *, E:9AM.C. The code editor contains the same corrected C code as the previous screenshot.

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
{
printf("a");
printf("b");
}
else
{
printf("c");
}
printf("d");
getch();
}
/* abd */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
{
printf("a");
printf("b");
}
else
{
printf("c");
printf("d");
}
getch();
}
/* ab */
```

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
{
printf("a");
printf("b");
}
else
{
printf("c");
printf("d");
}
getch();
}
/* ab */
```

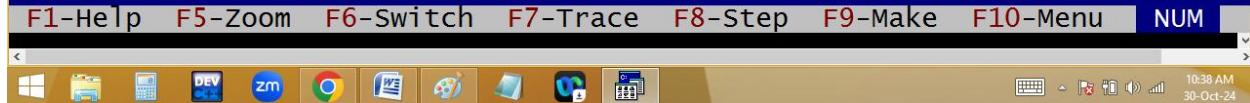
The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Misplaced else in function main" is displayed at the top. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 ) ;
{
printf("a");
printf("b");
}
else_
{
printf("c");
printf("d");
}
getch();
}
```

The screenshot shows the Turbo C IDE interface after the code has been corrected. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar indicates Line 19, Col 11, Insert, Indent Tab, Fill, Unindent, *, E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( 5.5 )
{
printf("a");
printf("b");
}
else ;
{
printf("c");
printf("d");
}
getch();
}

/* abcd */
```



The image shows three separate windows of a C compiler IDE (TURBO C) running on a Windows operating system. Each window has a dark blue background and a standard Windows-style title bar.

Top Window:

- Menu Bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch
- Status Bar: Line 6 Col 23 Insert Indent Tab Fill Unindent * E:9AM.C
- Code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if( "abcd" > "ab" )    -
{
printf("a");
printf("b");
}
else
{
printf("c");
printf("d");
}
getch();
}

/* cd */
```

Middle Window:

- Menu Bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch
- Status Bar: Error: Misplaced else in function main
- Code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
else_
{
printf("c");
printf("d");
}
getch();
}

/* Error */
```

Bottom Window:

- Menu Bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch
- Status Bar: 10:44 AM 30-Oct-24
- Code: Same as the middle window (Error: Misplaced else in function main)

TC

File Edit Run Compile Project Options Debug Break/watch
Line 18 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
float a=1.1;
clrscr();
if(a==1.1)puts("True");else puts("False");
if(a==1.1f)puts("True");else puts("False");
a=1.0;
if(a==1.0)puts("True");else puts("False");
a=1.5;
if(a==1.5)puts("True");else puts("False");
a=9.6;
if(a==9.6)puts("True");else puts("False");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

False
True
True
True
False

10:49 AM
30-Oct-24

A screenshot of a Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it shows "Line 7 Col 12 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
if(5 && 5 == 5 ) puts("Equal");else puts("Not Equal");
if((5 && 5) == 5 ) puts("Equal");else puts("Not Equal");
getch();
}
```

The terminal window displays the output of the program:

```
Equal
Not Equal
```

The desktop taskbar at the bottom shows several pinned icons, including Windows, File Explorer, Task View, DEV, zm, Google Chrome, Microsoft Edge, Paint, and FileZilla. The system tray in the bottom right corner shows the date and time as "9:20 AM 01-Nov-24".

I E
I && E
if(5 && 5) == 5) p("Equal"); else p("Not Equal");
I && J
I == 5

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=32767;
clrscr();
if(a+3>32767) puts("True");else puts("False");
if(sizeof(50000)==sizeof(float)) puts("True");else printf("False");
if(sizeof(1.2)>=sizeof(float)) puts("True");else printf("False");
getch();
}
```

The terminal window also shows the system menu bar at the top with options like File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 7 Col 38 Insert Indent Tab Fill Unindent * E:9AM.C". The bottom of the terminal window shows the Windows taskbar with various icons and the system tray.

The terminal output is:

```
False
True
True
True
```

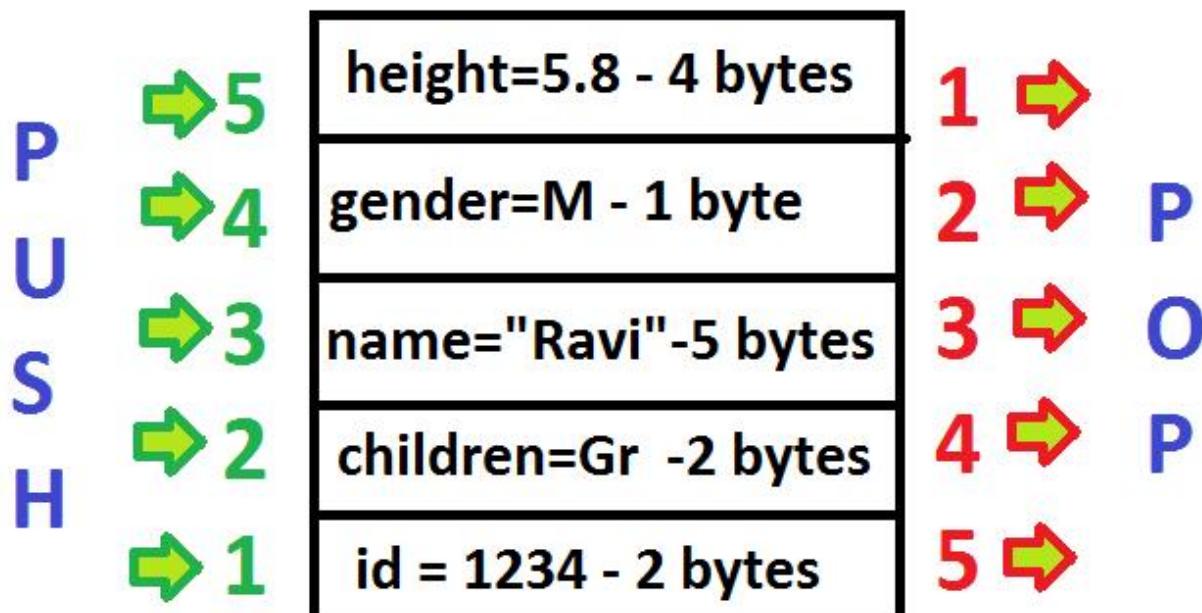
Variable memory allocation:

Int id=1234, children;

Char name[]="Ravi", gender='F';

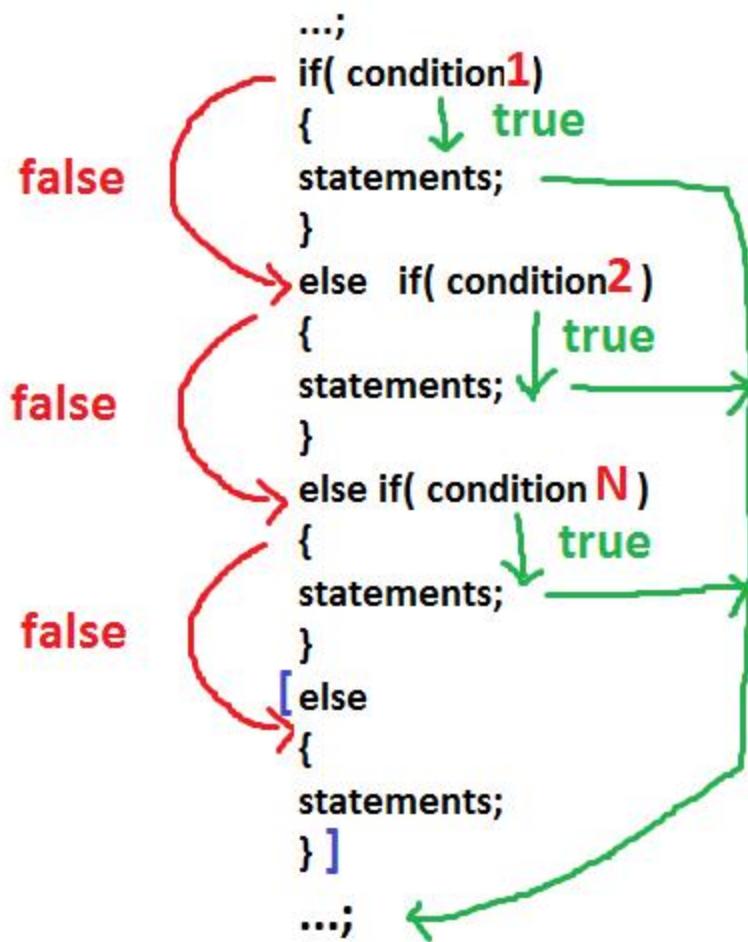
Float height=5.8;

stack area



LIFO-LAST IN FIRST OUT
FILO-FIRST IN LAST OUT

If..else if / ladder if:



Finding max in 2 no's:

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 indicates Line 13, Col 1, Insert, Indent Tab, Fill Unindent, and E:9AM.C. The code in the editor compares two integers, a and b, using if-else statements. The output window shows the results of running the program with input values 3 and 3.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a, b values "); scanf("%d %d",&a, &b);
if(a>b) puts("a is big");
else puts("b is big");
if(a>b) printf("%d is big\n",a);
else printf("%d is big\n",b);
if(a>b)puts("a is big");
else if(b>a)puts("b is big");
else puts("Both are equal");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

9:51 AM
01-Nov-24

```
Enter a, b values 3 3
b is big
3 is big
Both are equal
```

```
TC
Enter a, b values 7 2
a is big
7 is big
a is big

TC
Enter a, b values 6 9
b is big
9 is big
b is big
```

Finding max in 3 no's:

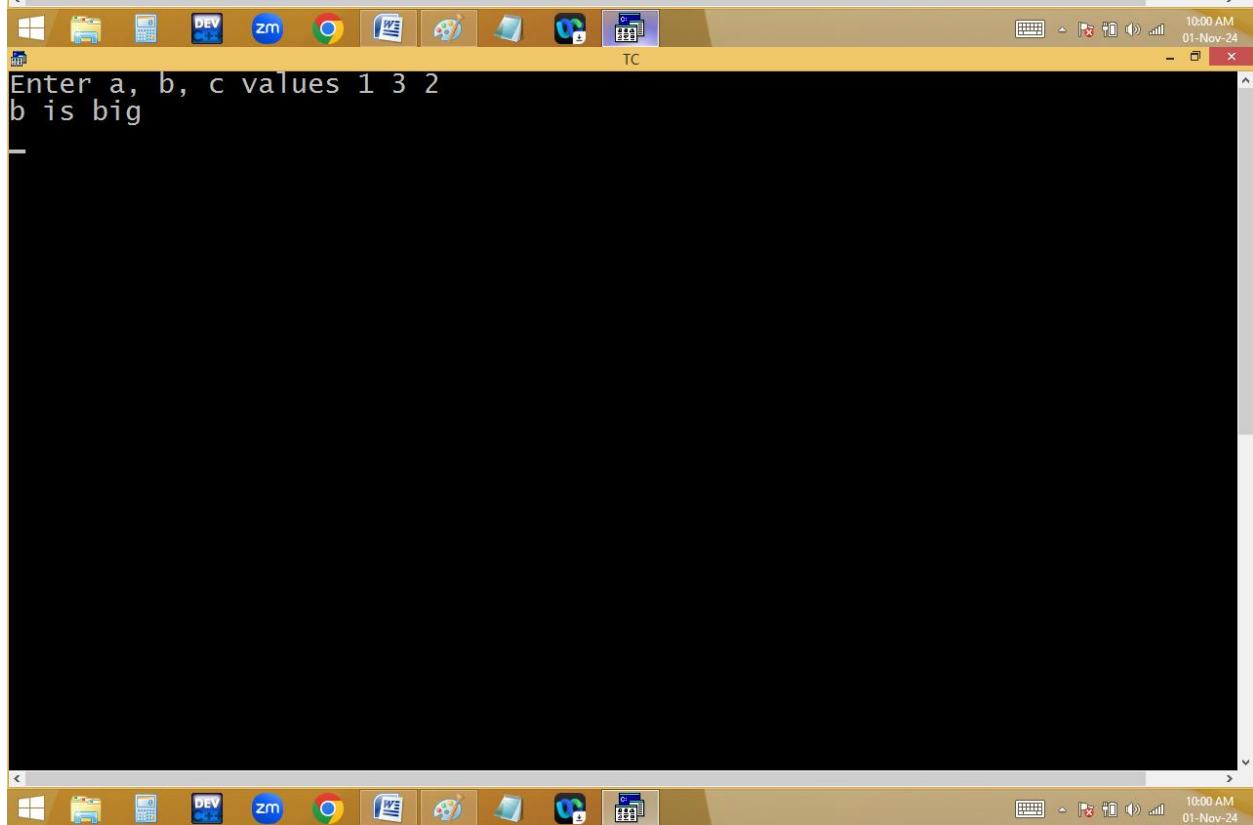
The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a yellow header bar with the text "TC" at the top right. Below the header is a menu bar with options: File, Edit, Run, Compile, Project, Options, Debug, Break/watch. The status bar at the bottom of the terminal window displays "Line 11 Col 20 Insert Indent Tab Fill Unindent * E:9AM.C". The main body of the terminal window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
printf("Enter a, b, c values ");
scanf("%d %d %d",&a,&b,&c);
if(a==b && a==c) puts("All are equal");
else if(a>b && a>c)puts("a is big");
else if(b>c)puts("b is big");
else puts("c is big");
getch();
}
```

Below the terminal window, the Windows taskbar is visible, showing various pinned icons like File Explorer, Edge, and Control Panel. The system tray shows the date and time as "01-Nov-24" and "10:00 AM".

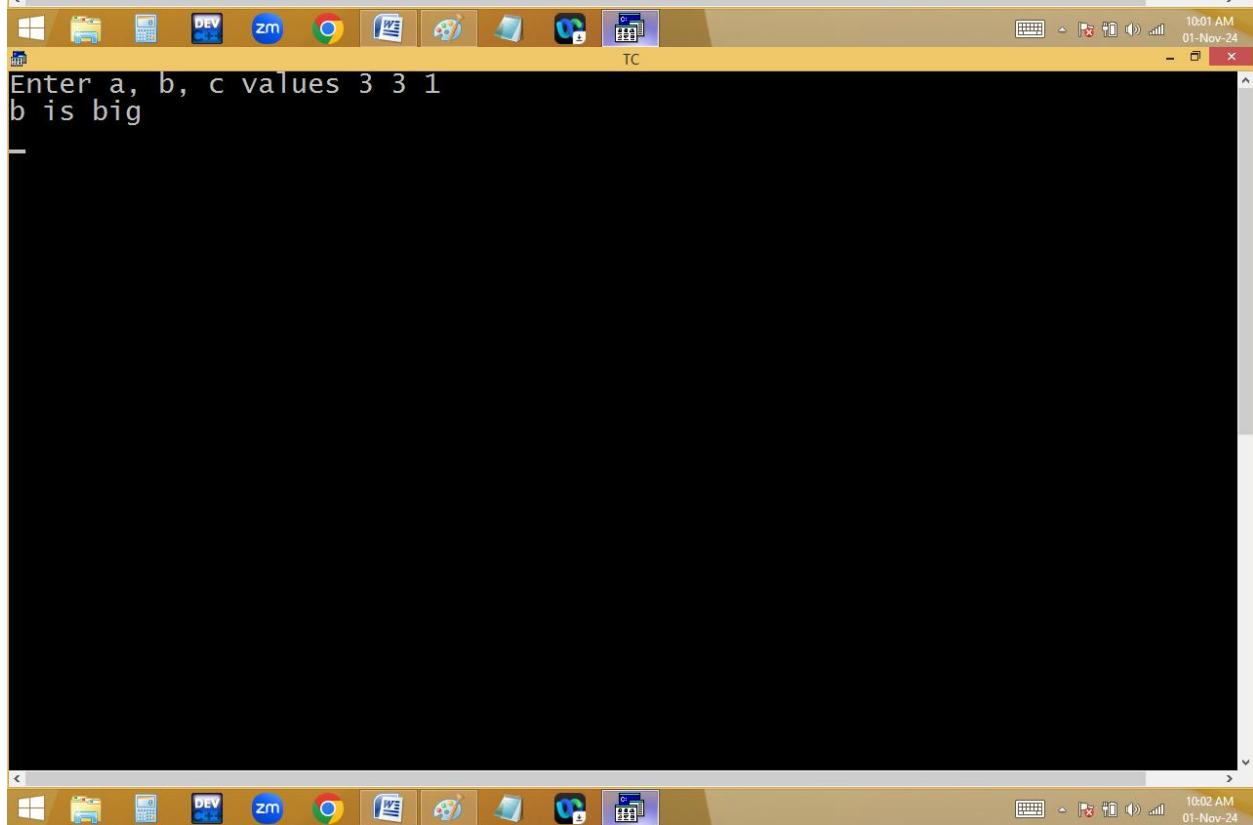
```
TC
Enter a, b, c values 3 2 1
a is big

Enter a, b, c values 1 3 2
b is big
```

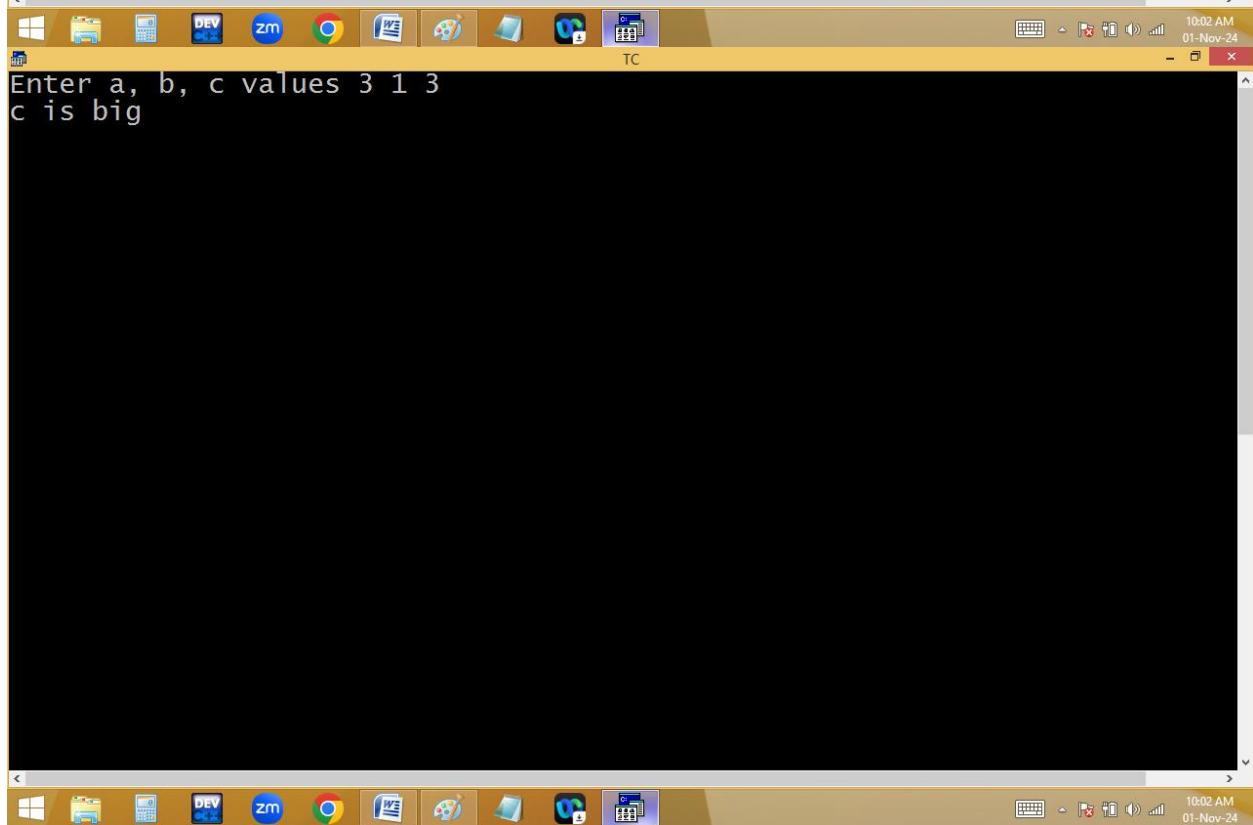
The image shows a Windows desktop environment with three identical windows stacked vertically. Each window has a yellow title bar with the text 'TC'. The windows contain the same text: 'Enter a, b, c values 3 2 1' and 'a is big' in the top window, and 'Enter a, b, c values 1 3 2' and 'b is big' in the bottom window. Below the windows is a standard Windows taskbar with several icons: Start, File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, and File Explorer. The taskbar also displays the date and time as '10:00 AM 01-Nov-24'.

```
TC
Enter a, b, c values 2 2 2
All are equal
-
-
-
Enter a, b, c values 3 3 1
b is big
-
-
-

```

The image shows a Windows desktop environment with three separate windows stacked vertically. Each window has a yellow title bar with the text 'TC' and standard window controls (minimize, maximize, close). The first window contains the text 'Enter a, b, c values 2 2 2' followed by 'All are equal' on a new line. The second window contains 'Enter a, b, c values 3 3 1' followed by 'b is big' on a new line. The third window is identical to the second. Below these windows is a Windows taskbar with a yellow background. It features several pinned icons: File Explorer, File Manager, Task View, DEV (highlighted in blue), zm, Google Chrome, Microsoft Edge, Paint, and File Explorer again. On the right side of the taskbar, there is a keyboard icon, a battery icon, a signal strength icon, and the date and time '10:01 AM 01-Nov-24'. The taskbar also includes standard window controls for minimizing, maximizing, and closing.

```
TC
Enter a, b, c values 3 4 4
c is big
-
-
-
Enter a, b, c values 3 1 3
c is big
```

The image shows a Windows operating system desktop environment with three identical windows stacked vertically. Each window has a yellow title bar with the text 'TC' and a red 'X' button. The windows contain black command-line interfaces. The top window shows the command 'Enter a, b, c values 3 4 4' followed by the output 'c is big'. The middle window shows the command 'Enter a, b, c values 3 1 3' followed by the output 'c is big'. The bottom window is mostly blank. Below the windows is a standard Windows taskbar with several pinned icons: File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, Microsoft Edge, Paint, Snipping Tool, and File Explorer again. The taskbar also displays the date and time as '10:02 AM 01-Nov-24'.

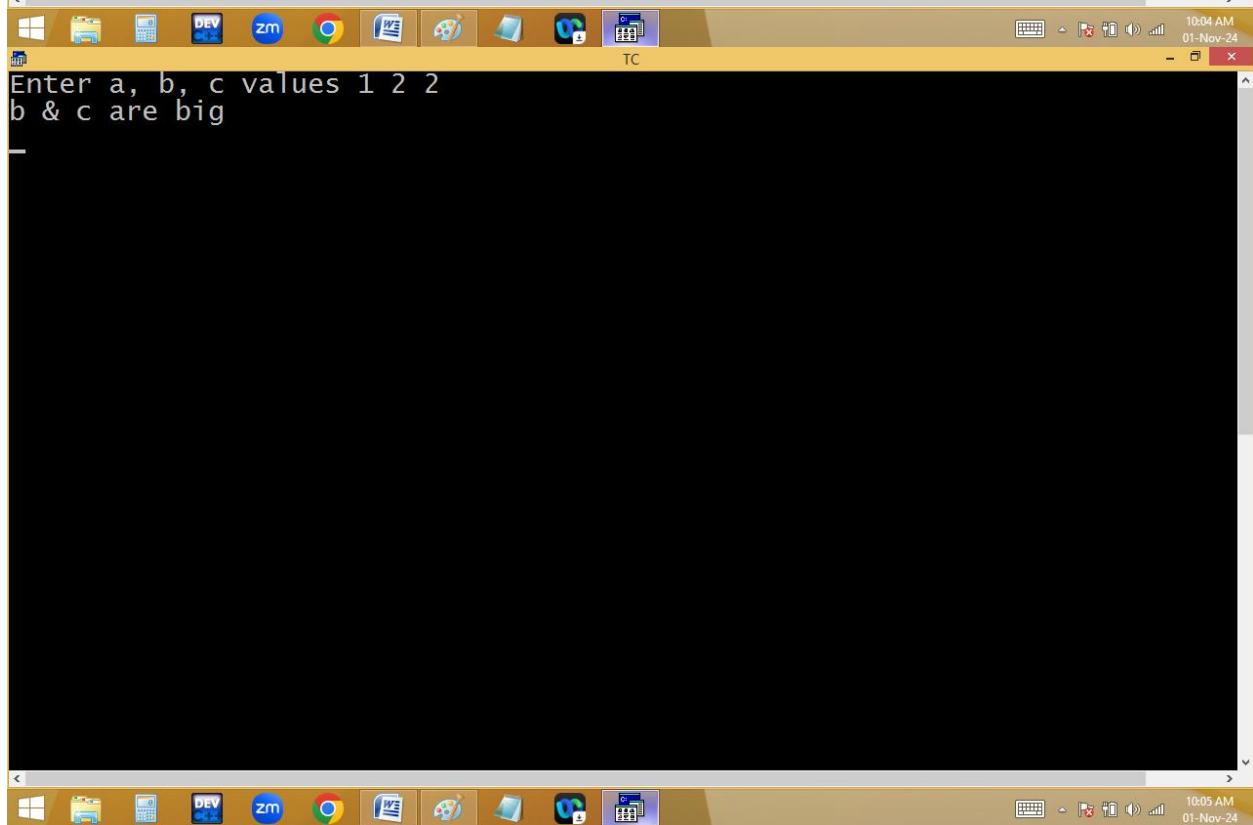
The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top right indicates Line 12, Col 21, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
printf("Enter a, b, c values "); scanf("%d %d %d",&a,&b,&c);
if(a==b && a==c) puts("All are equal");
else if(a>b && a>c)puts("a is big");
else if(a==b && a>c)puts("a & b are big");
else if(b==c && b>a)puts("b & c are big");
else if(a==c && a>b)puts("a & c are big");
else if(b>c)puts("b is big");
else puts("c is big");
getch();
}
```

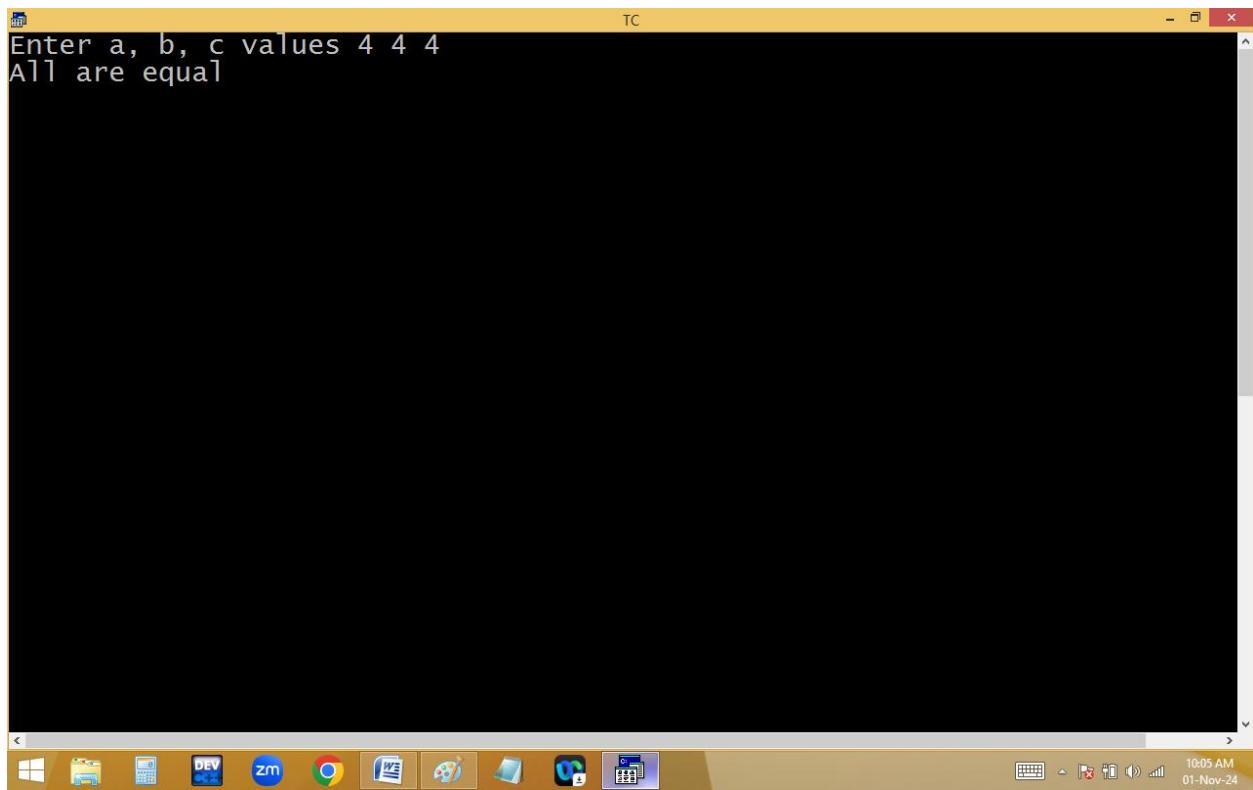
The terminal window below shows the output of the program when run with input 3 3 2, displaying "a & b are big". The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:04 AM on 01-Nov-24.

```
TC
Enter a, b, c values 3 1 3
a & c are big

Enter a, b, c values 1 2 2
b & c are big
```

The image shows a Windows desktop environment with three separate windows stacked vertically. Each window has a yellow title bar with the text 'TC' and a red close button. The first window contains the text 'Enter a, b, c values 3 1 3' and 'a & c are big'. The second window contains the text 'Enter a, b, c values 1 2 2' and 'b & c are big'. The third window is partially visible at the bottom. The Windows taskbar is visible at the bottom of each window, featuring various icons for common applications like File Explorer, Task View, and Control Panel. The system tray on the right side of the taskbar shows the date and time as '01-Nov-24' and the time as '10:04 AM' for the top window, '10:05 AM' for the middle window, and '10:05 AM' for the bottom window.

```
TC
Enter a, b, c values 4 4 4
All are equal
```



The screenshot shows a Windows operating system interface. At the top is a title bar with the text "TC". Below it is a black command-line window containing the text "Enter a, b, c values 4 4 4" on the first line and "All are equal" on the second line. The window has standard window controls (minimize, maximize, close) in the top right corner. At the bottom of the screen is a taskbar with several pinned icons, including File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer again, and File Explorer once more. On the far right of the taskbar, the date and time are displayed as "10:05 AM 01-Nov-24".

A screenshot of a Windows operating system desktop. At the top, there is a standard window title bar with the letters 'TC' in the center. Below it is a large black terminal window. Inside the terminal, white text is displayed. The first instance shows the user entering values '1 2 3' and the program outputting 'c is big'. The second instance shows the user entering values '-1 -2 -3' and the program outputting 'a is big'. The desktop background is solid black. Along the bottom edge of the screen is a yellow taskbar containing icons for various applications such as File Explorer, Microsoft Edge, FileZilla, and others. On the far right of the taskbar, the system tray shows the date and time as '10:05 AM 01-Nov-24'. The overall appearance is that of an older Windows version.

Finding +Ve / -Ve/ 0:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window is titled 'TC' and displays a C program being run. The code checks if a user input is positive, negative, or zero. The terminal output shows the program's execution and its result for an input of 4.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
if(n>0)puts("+Ve");
else if(n<0) puts("-Ve");
else puts("Zero");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter n value 4
+Ve

```
TC
Enter n value -7
-Ve

Enter n value 0
Zero
```

The image shows a Windows operating system desktop with three separate command-line windows (CMD) open vertically. The top window has a yellow title bar labeled 'TC' and displays the text 'Enter n value -7' followed by '-Ve'. The middle window has a blue title bar labeled 'TC' and displays the text 'Enter n value 0' followed by 'Zero'. The bottom window has a red title bar labeled 'TC' and displays the text 'Enter n value 0'. The desktop background is black. At the bottom of the screen is a taskbar with several pinned icons, including File Explorer, Task View, Edge browser, and others. The system tray shows the date and time as 10:17 AM on 01-Nov-24.

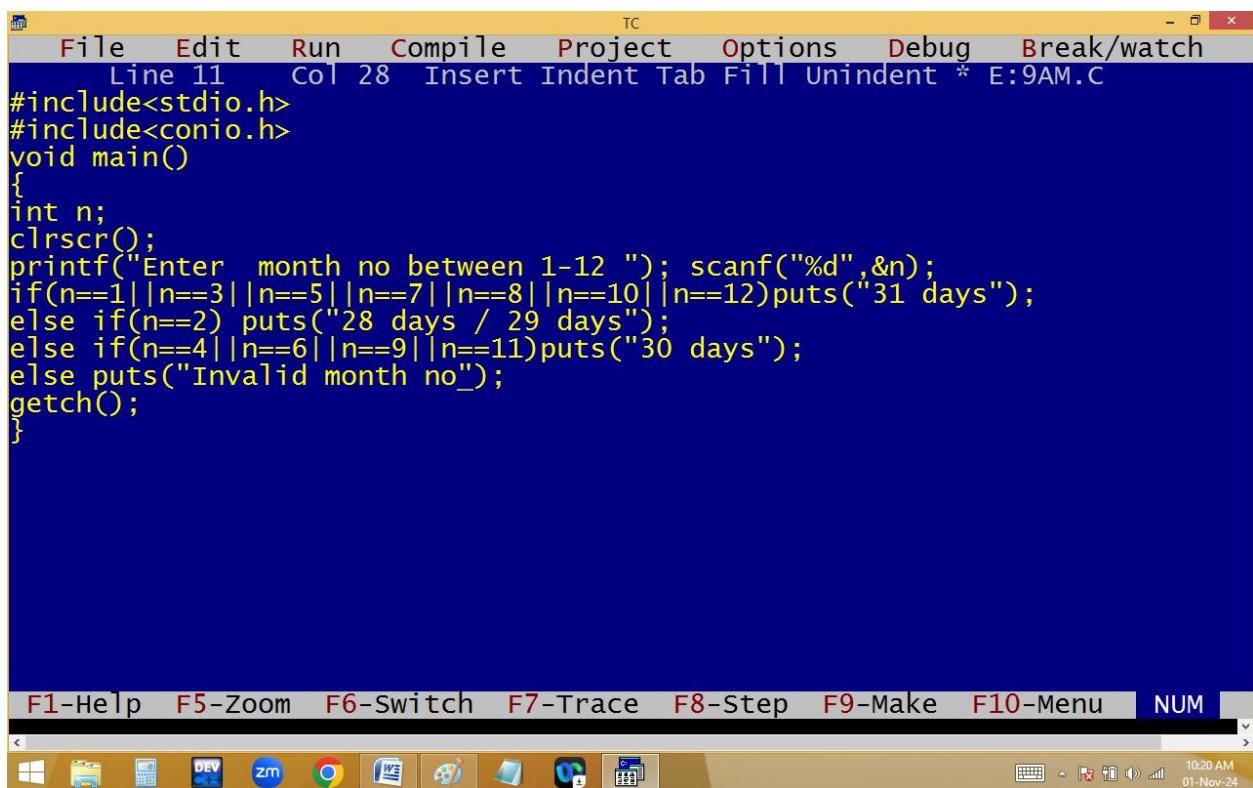
Finding no of days in given month:

1,3,5,7,8,10,12 – 31 days

2 – 28/29 days

4,6,9,11 – 30 days

Others – invalid

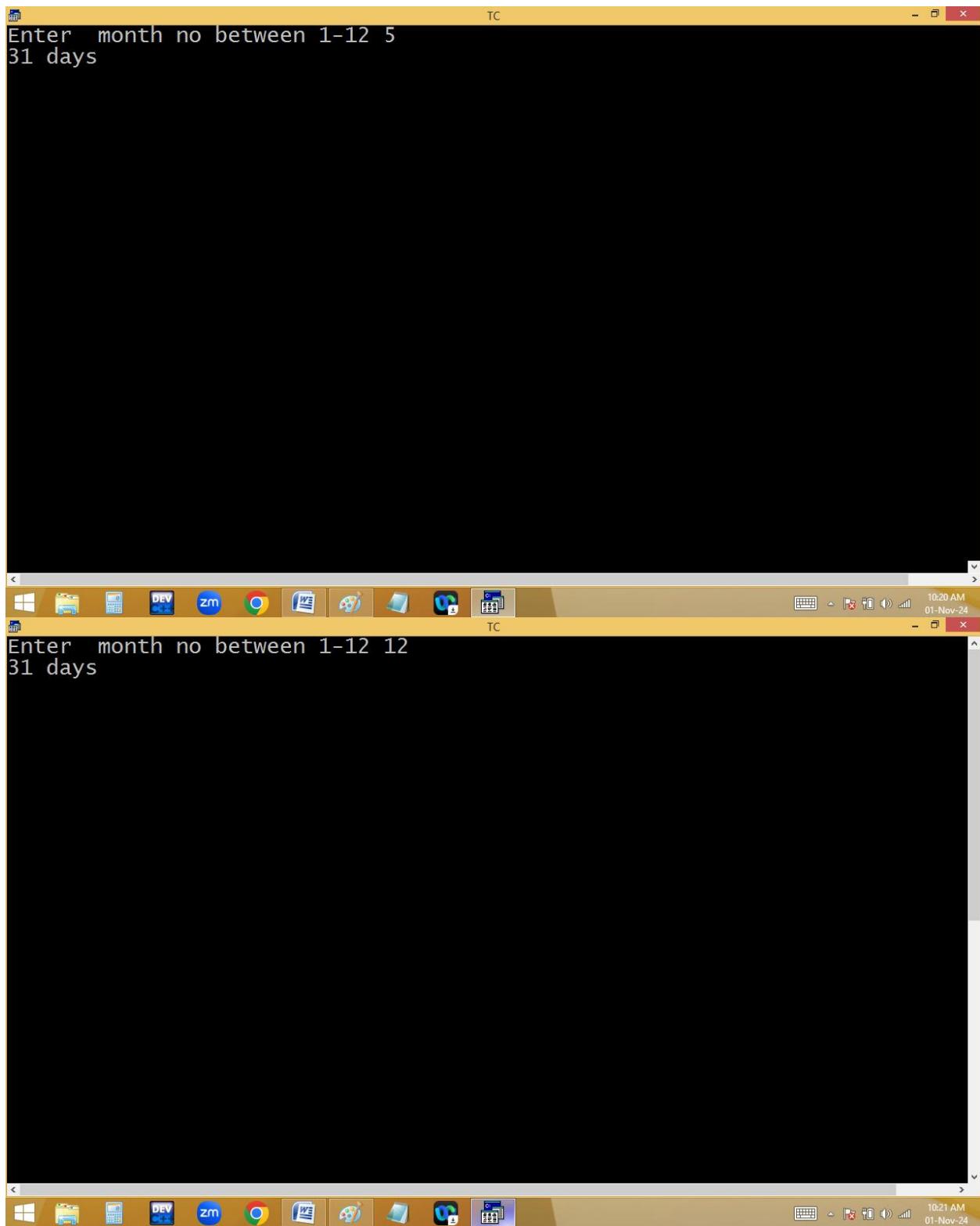


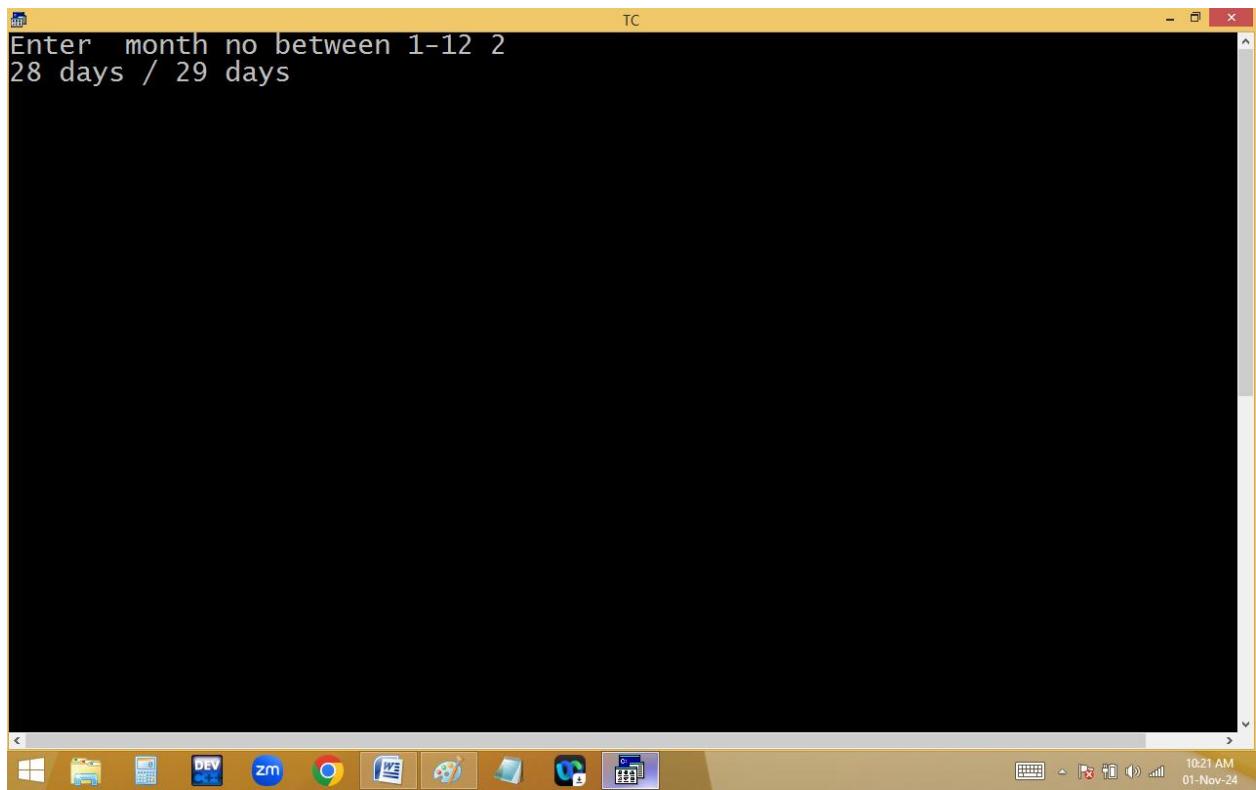
The screenshot shows a Microsoft Visual Studio Code window with the following details:

- Title Bar:** TC
- Menu Bar:** File Edit Run Compile Project Options Debug Break/watch
- Status Bar:** Line 11 Col 28 Insert Indent Tab Fill Unindent * E:9AM.C
- Code Area:** C code that prompts the user for a month number (n) and prints the number of days based on the value of n.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter month no between 1-12 "); scanf("%d",&n);
if(n==1||n==3||n==5||n==7||n==8||n==10||n==12)puts("31 days");
else if(n==2) puts("28 days / 29 days");
else if(n==4||n==6||n==9||n==11)puts("30 days");
else puts("Invalid month no");
getch();
}
```

- Bottom Bar:** F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu | NUM
- Taskbar:** Shows icons for various applications including Windows Start, File Explorer, Task View, Developer Command Prompt, Zoom, Google Chrome, FileZilla, Paint, and others.
- System Tray:** Shows the date and time (10:20 AM 01-Nov-24).





```
TC
Enter month no between 1-12 15
Invalid month no

-

```



```
TC
Enter month no between 1-12 11
30 days

-

```



```
TC

```

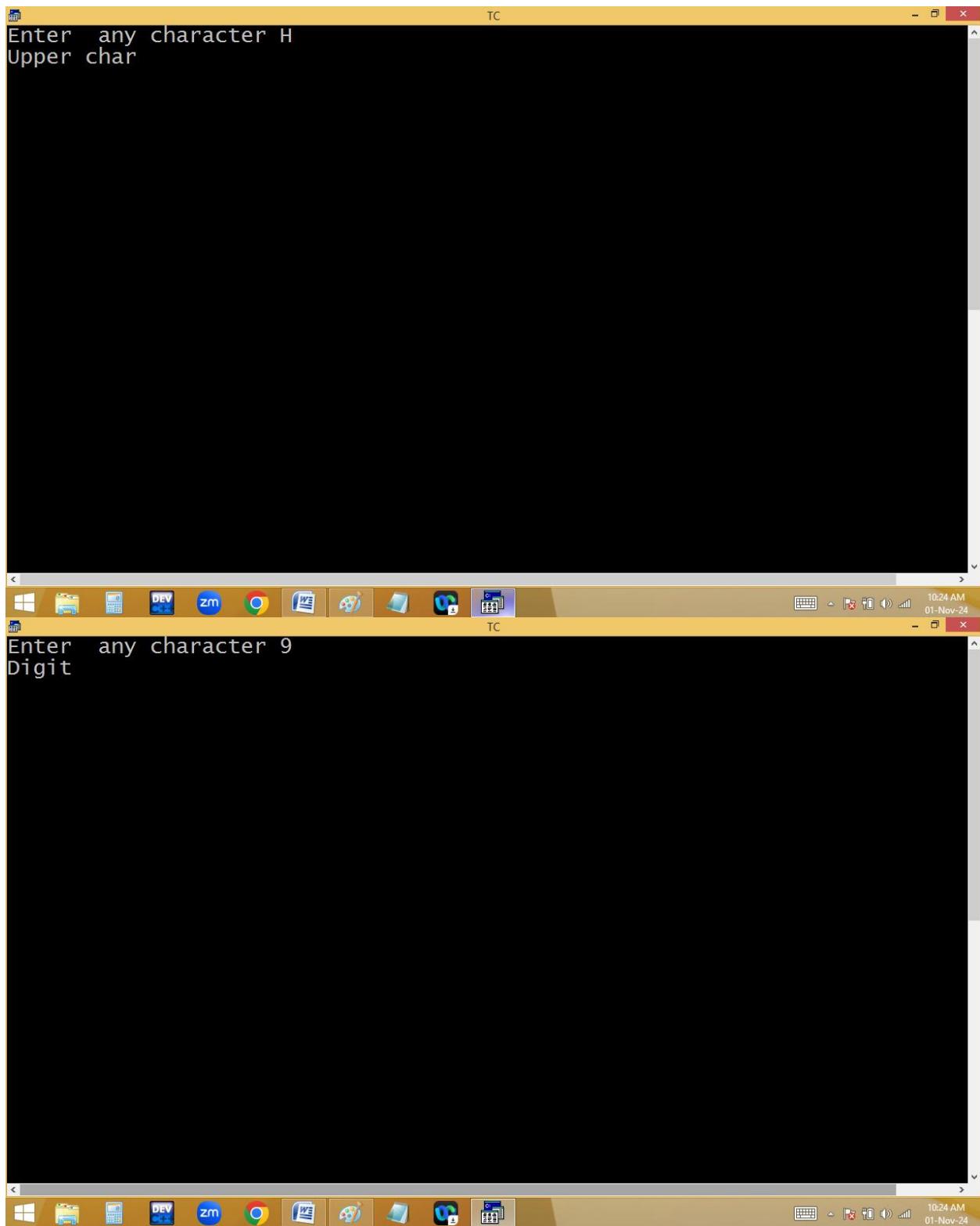
Finding lower / upper / digit / space / special char:

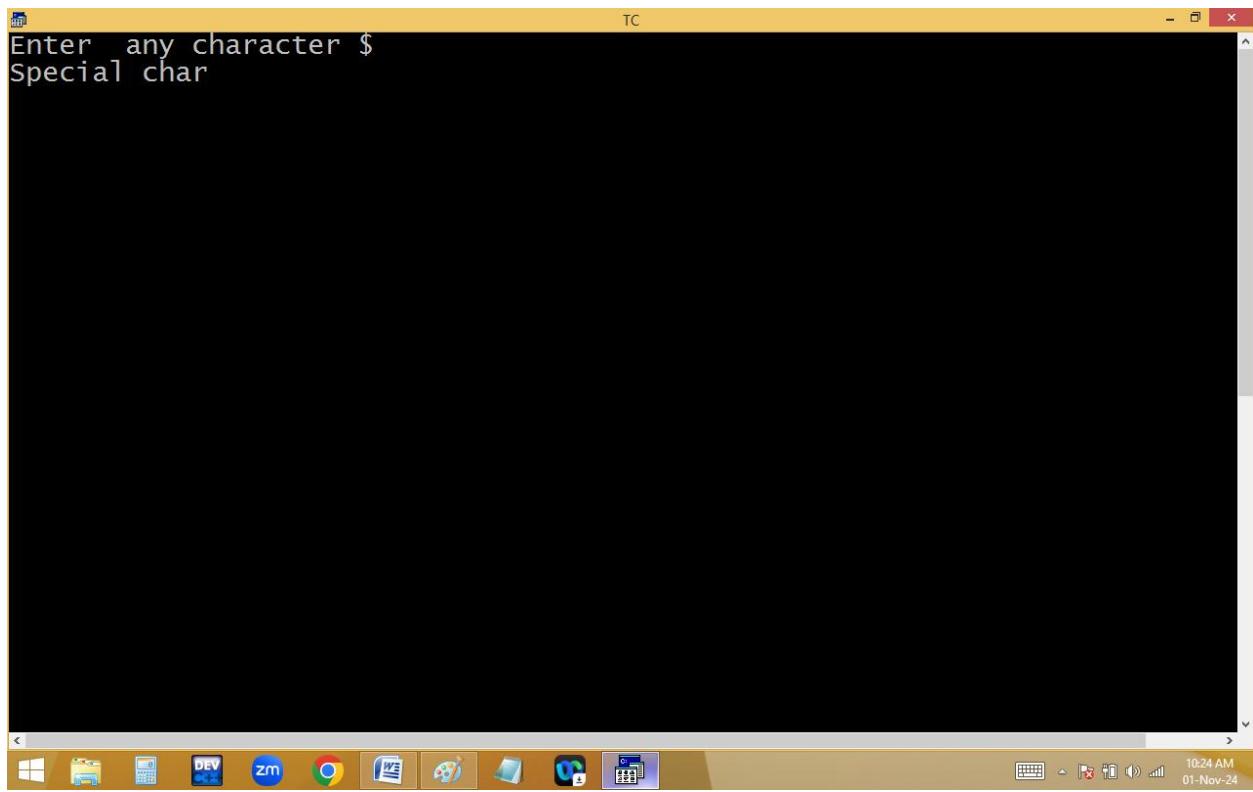
The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run. The program prompts the user to enter a character, checks if it's lowercase, uppercase, a digit, or a space, and then prints the result. The terminal window includes standard Windows-style scroll bars on the right side.

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(ch>='a' && ch<='z')puts("Lower char");
else if(ch>='A' && ch<='Z') puts("Upper char");
else if(ch>='0' && ch<='9')puts("Digit");
else if(ch==' ')puts("Space");
else puts("Special char");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter any character g
Lower char





```
TC
Enter any character
Space

Enter any character Aa5 *
Upper char
```

The image shows three screenshots of a Windows desktop environment. Each screenshot displays a terminal window titled 'TC' with a black background and white text. The first screenshot shows the prompt 'Enter any character' followed by 'Space'. The second screenshot shows the prompt 'Enter any character' followed by 'Aa5 *' and 'Upper char'. The desktop taskbar at the bottom of each screenshot shows various icons for applications like File Explorer, Task View, and system utilities. The system tray in the bottom right corner of each screenshot displays the date and time as '10:24 AM 01-Nov-24'.

Using ascii values:

The screenshot shows a Windows operating system interface with two windows open. The top window is a terminal or code editor titled "TC". It has a menu bar with "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom indicates "Line 11 Col 15 Insert Indent Tab Fill Unindent * E:9AM.C". The code inside the window is:

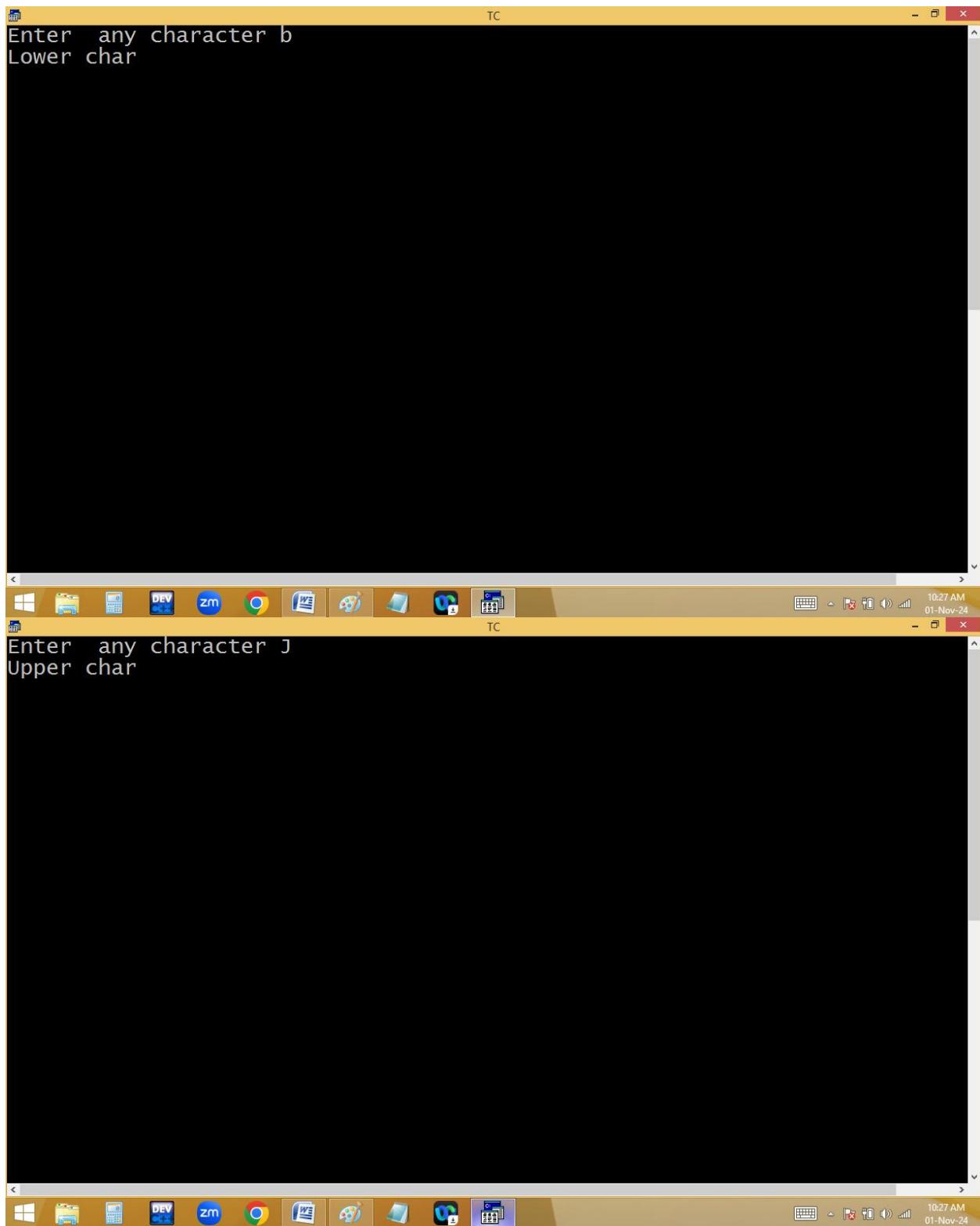
```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(ch>=97 && ch<=122)puts("Lower char");
else if(ch>=65 && ch<=90) puts("Upper char");
else if(ch>=48 && ch<=57)puts("Digit");
else if(ch==32)puts("Space");
else puts("Special char");
getch();
}
```

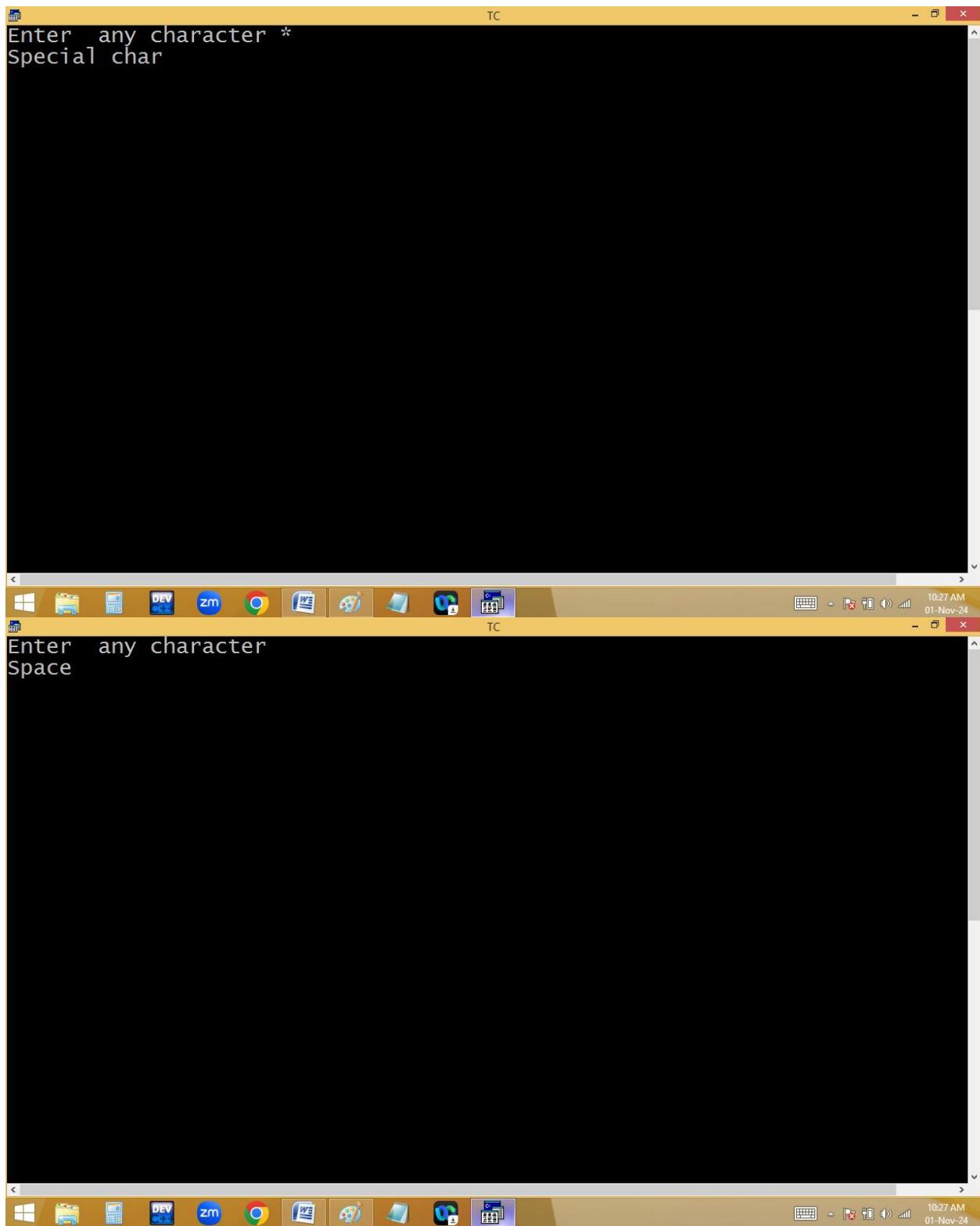
The bottom window is a command prompt window titled "TC". It displays the output of the program: "Enter any character 9" followed by "Digit".

The screenshot shows a Windows operating system interface with two windows open. The top window is a terminal or code editor titled "TC". It has a menu bar with "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom indicates "Line 11 Col 15 Insert Indent Tab Fill Unindent * E:9AM.C". The code inside the window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(ch>=97 && ch<=122)puts("Lower char");
else if(ch>=65 && ch<=90) puts("Upper char");
else if(ch>=48 && ch<=57)puts("Digit");
else if(ch==32)puts("Space");
else puts("Special char");
getch();
}
```

The bottom window is a command prompt window titled "TC". It displays the output of the program: "Enter any character 9" followed by "Digit".





Using predefined functions:

The screenshot shows the Turbo C++ IDE interface. The code in the editor window is as follows:

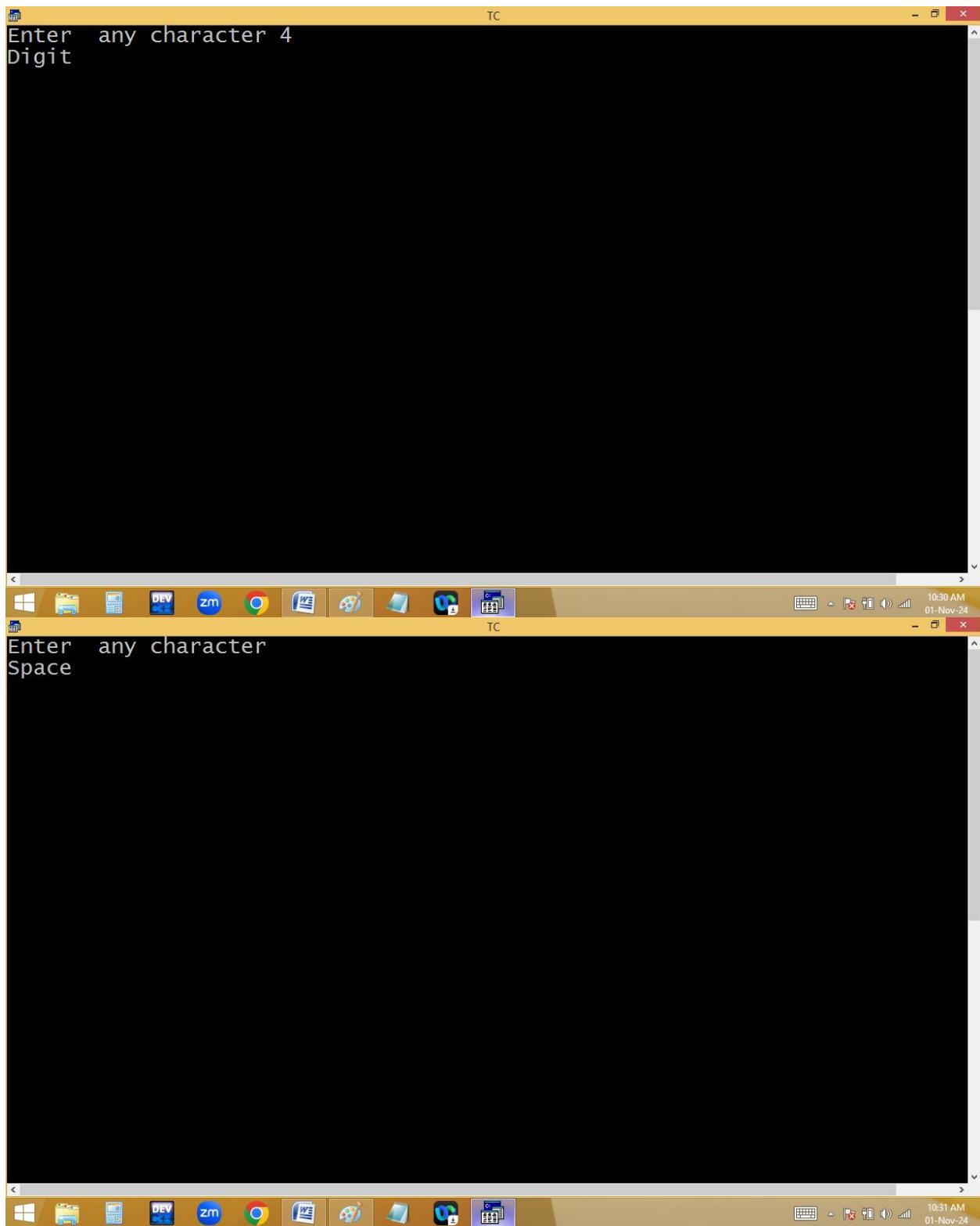
```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(islower(ch))puts("Lower char");
else if(isupper(ch)) puts("Upper char");
else if(isdigit(ch))puts("Digit");
else if(isspace(ch))puts("Space");
else puts("Special char");
getch();
}
```

The output window displays the following text:

```
Enter any character u
Lower char
```

The status bar at the bottom of the screen shows the date and time as 10:30 AM 01-Nov-24.

The image shows a Windows operating system interface. At the top, there is a black window with white text that reads "Enter any character R" and "Upper char". Below it, another black window has the text "Enter any character #" and "Special char". Both of these windows appear to be command-line or terminal windows. In the center, a standard Windows desktop environment is visible, featuring a taskbar with icons for various applications such as File Explorer, Google Chrome, Microsoft Word, and others. The system tray at the bottom right shows the date and time as "10:30 AM 01-Nov-24".



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 indicates Line 8, Col 43, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); ch=getch();
if(islower(ch))puts("Lower char");
else if(isupper(ch)) puts("Upper char");
else if(isdigit(ch))puts("Digit");
else if(isspace(ch))puts("Space");
else puts("Special char");
getch();
}
```

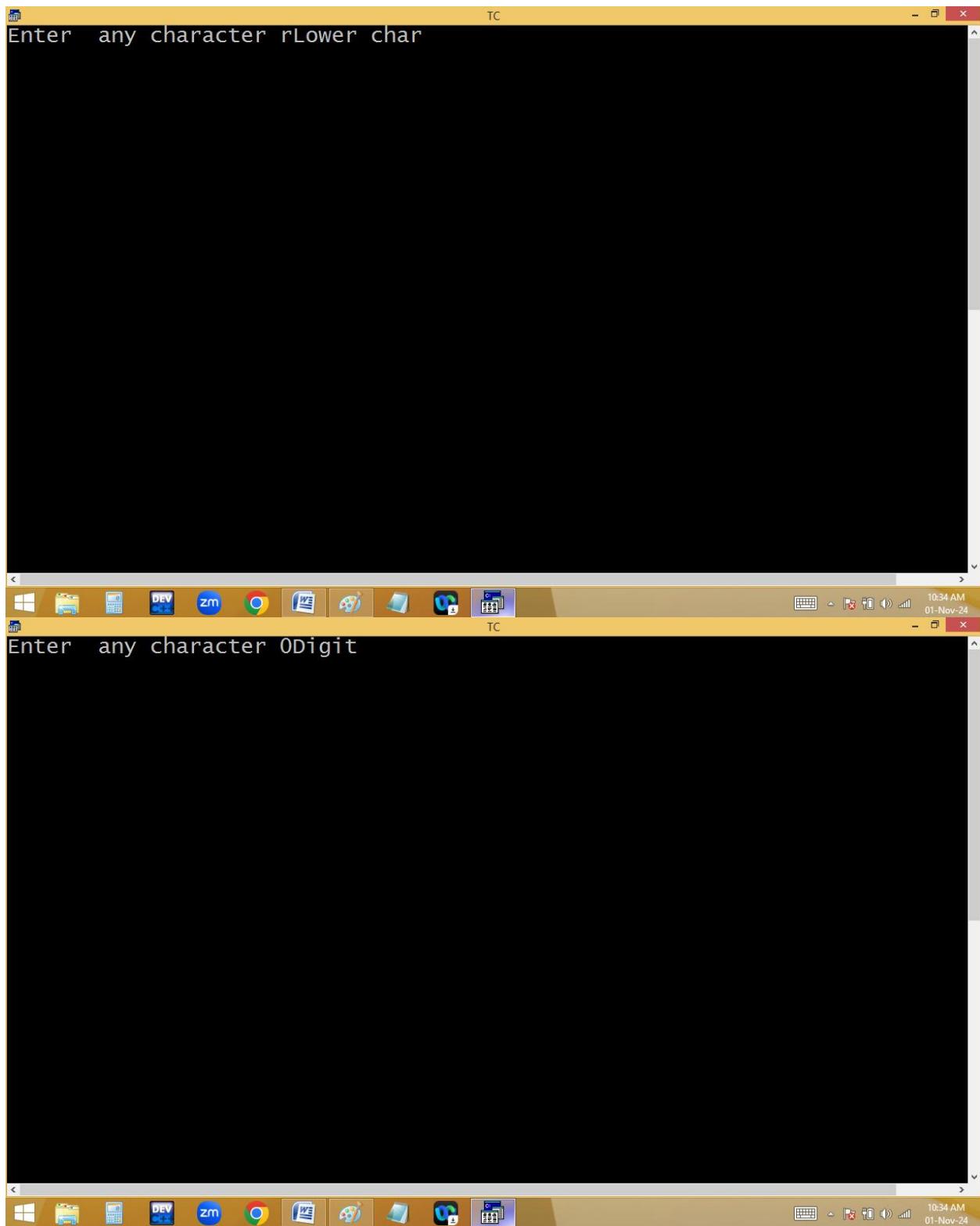
The terminal window below shows the output: "Enter any character Lower char". The taskbar at the bottom displays various application icons, and the system tray shows the date and time as 10:33 AM 01-Nov-24.

TC

Enter any character Digit

```
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 43 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); ch=getche();
if(islower(ch))puts("Lower char");
else if(isupper(ch)) puts("Upper char");
else if(isdigit(ch))puts("Digit");
else if(isspace(ch))puts("Space");
else puts("Special char");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM



The screenshot shows the Turbo C++ IDE interface. The code editor window displays a C program for character classification. The terminal window below shows the execution of the program, where it prompts for input and correctly identifies the entered character as a special character.

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); ch=getchar();
if(islower(ch))puts("Lower char");
else if(isupper(ch)) puts("Upper char");
else if(isdigit(ch))puts("Digit");
else ifisspace(ch)puts("Space");
else puts("Special char");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

TC

Enter any character *

Special char

getch()

getche()

getchar()

Reads single char	Reads single char	Reads single char
Entered char is not visible	char is visible	char is visible
Not waiting for enter key	Not waiting for enter key	Waiting for enter key
Belongs to conio.h	Belongs to conio.h	Belongs to stdio.h
char not changeable	char not changeable	char changeable

Note: All the above functions returns ASCII value(int) of reading character.

isupper(), islower(), isdigit(), isspace():

They are used to check the given character is upper / lower/ digit / space.

tolower(), toupper(): They are used to convert the character from upper case to lower and lower to upper.

All these functions / macros available in **<ctype.h>**

Lower to upper / upper to lower conversion:

$$a = 97$$

$$\begin{array}{r} -32 \\ \hline 65 = A \end{array}$$

$$\begin{array}{r} +32 \\ \hline \end{array}$$

$$a = 97$$

Using predefined functions:

A screenshot of 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 shows "Line 11 Col 20 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(islower(ch))ch=toupper(ch);
else ch=tolower(ch);
printf("char=%c ",ch);
getch();
}
```

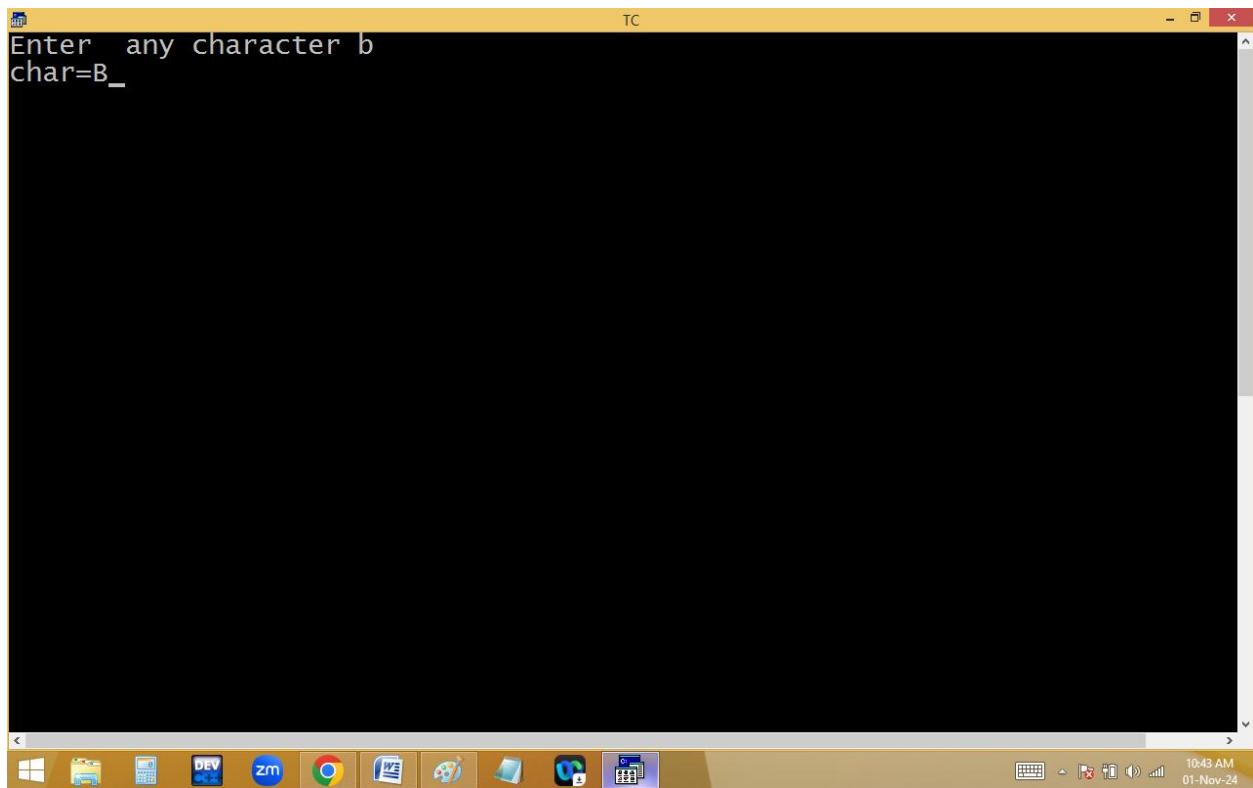
The status bar also displays keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM.

A screenshot of the terminal window from the Turbo C++ IDE. The window title is "TC". The terminal displays the output of the program:

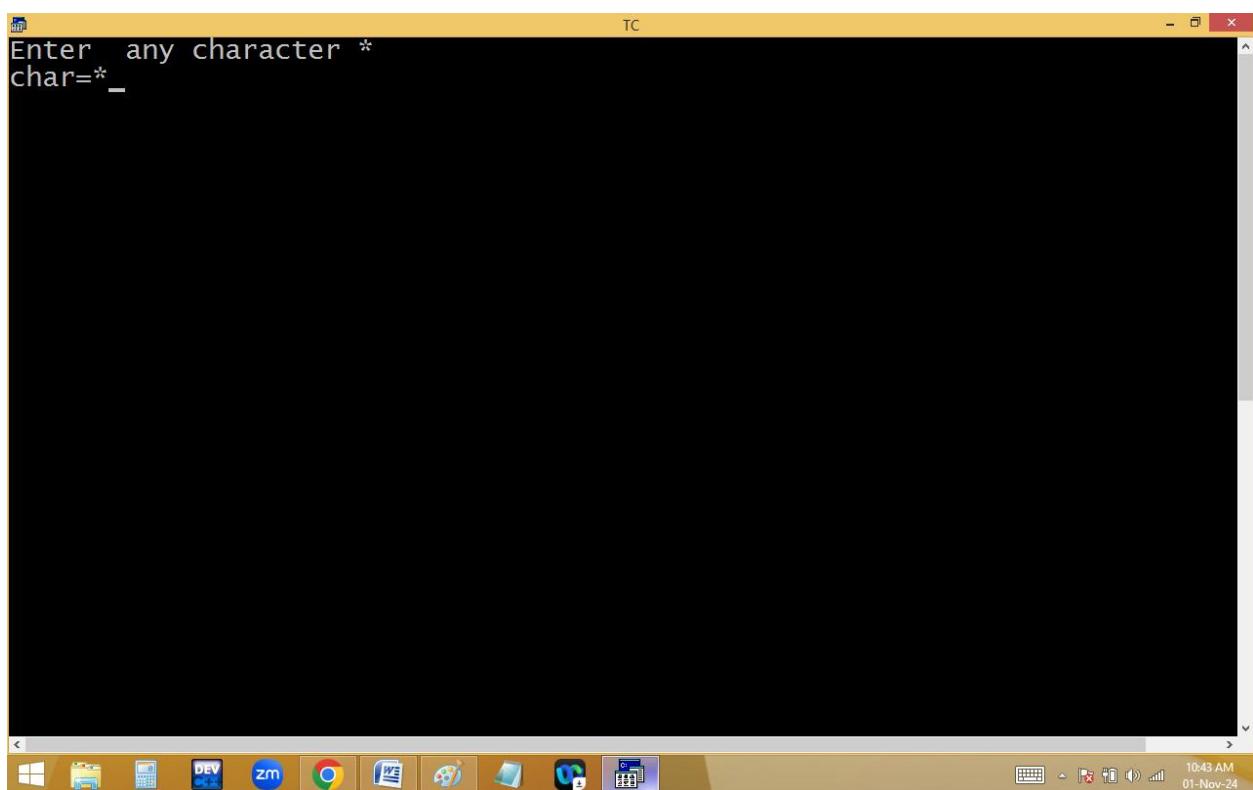
```
Enter any character H
char=h_
```

The status bar at the bottom of the terminal window shows the date and time: 10:42 AM 01-Nov-24.

```
TC
Enter any character b
char=B_
```



```
TC
Enter any character *
char=*_
```



Without predefined:

The screenshot shows a Windows operating system interface with two windows open. The top window is a terminal or code editor with a dark blue background. It has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 11 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(ch>='a' && ch<='z')ch=ch-32;
else ch=ch+32;
printf("char=%c ",ch);
getch();
}
```

The bottom window is a command prompt window with a black background. It has a menu bar at the top with options: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. Below the menu bar, it displays "TC". The command prompt window shows the output of the program:

```
Enter any character G
char=g
```

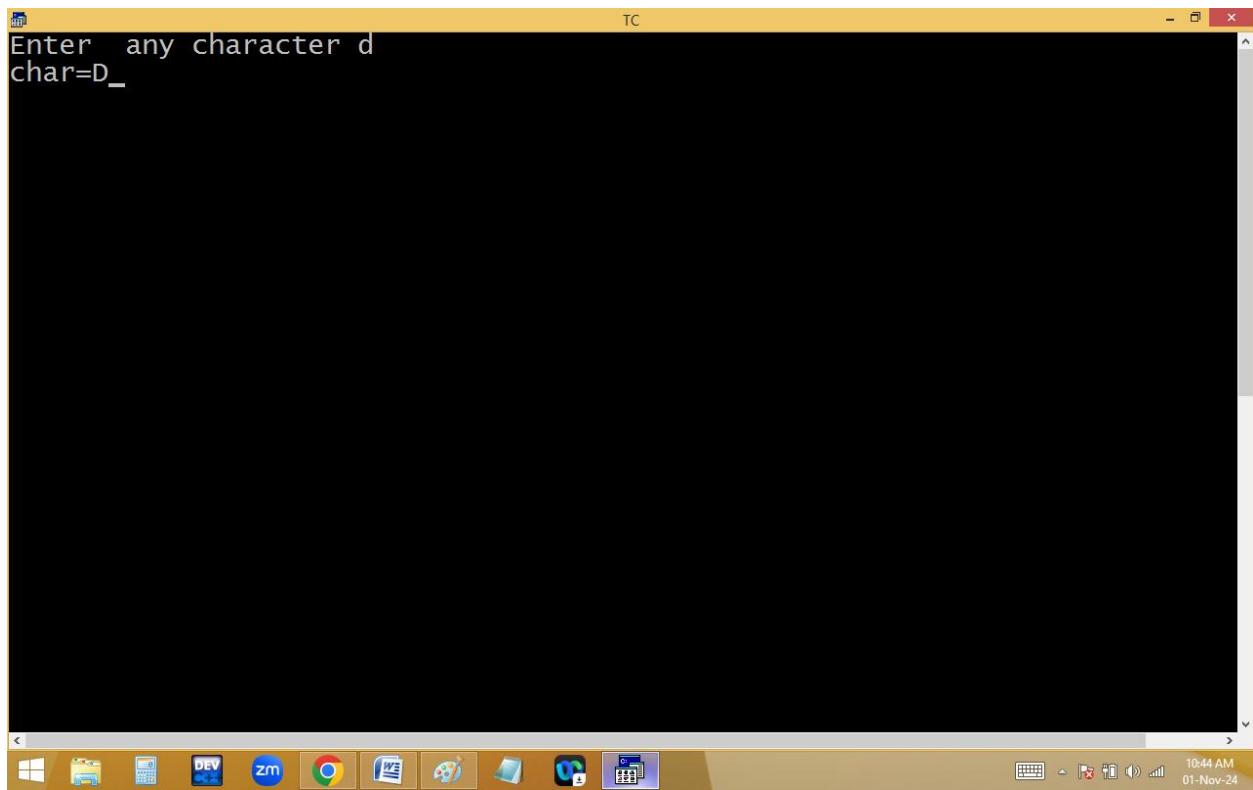
The screenshot shows a Windows operating system interface with two windows open. The top window is a terminal or code editor with a dark blue background. It has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, it displays "Line 11 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter any character "); scanf("%c",&ch);
if(ch>='a' && ch<='z')ch=ch-32;
else ch=ch+32;
printf("char=%c ",ch);
getch();
}
```

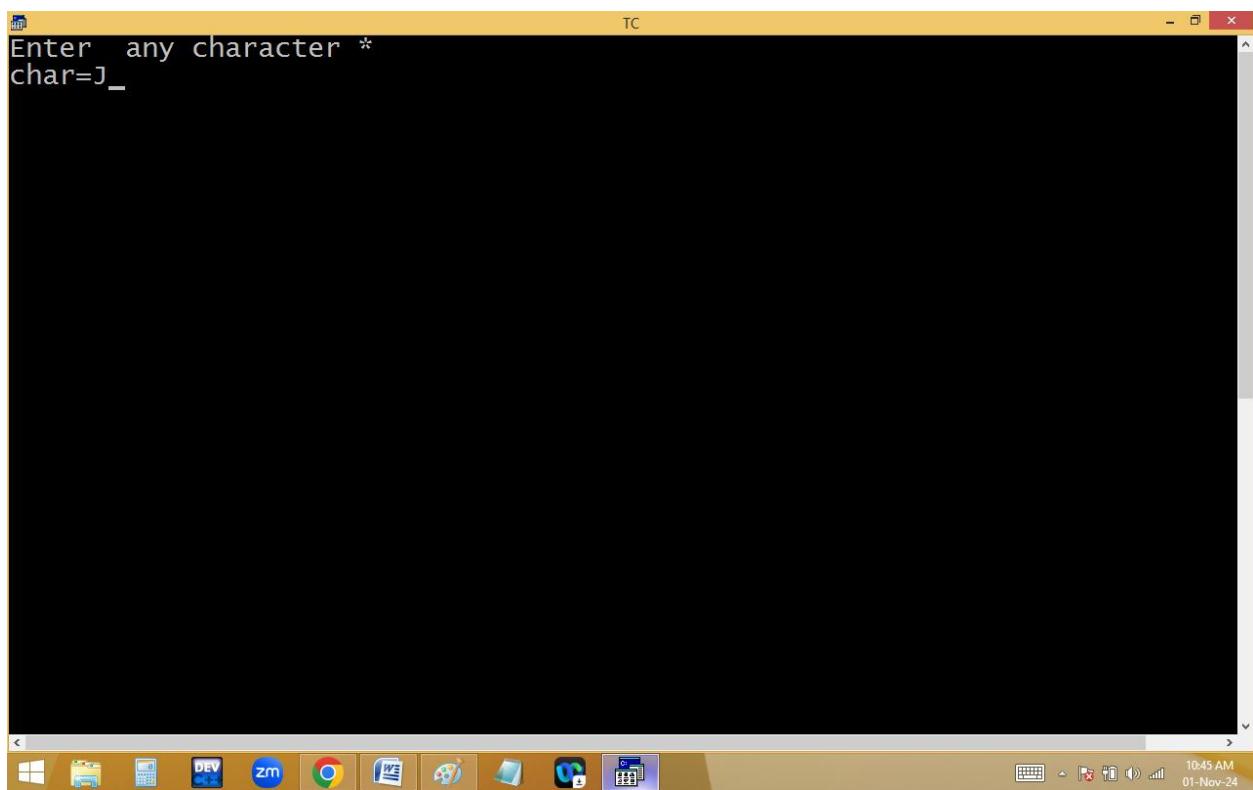
The bottom window is a command prompt window with a black background. It has a menu bar at the top with options: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. Below the menu bar, it displays "TC". The command prompt window shows the output of the program:

```
Enter any character G
char=g
```

```
TC
Enter any character d
char=D_
```



```
TC
Enter any character *
char=J_
```



TC

```
Enter any character 9
char=Y
```

Windows taskbar icons: DEV, zm, Google Chrome, Paint, etc.

System tray: 10:45 AM, 01-Nov-24

TC

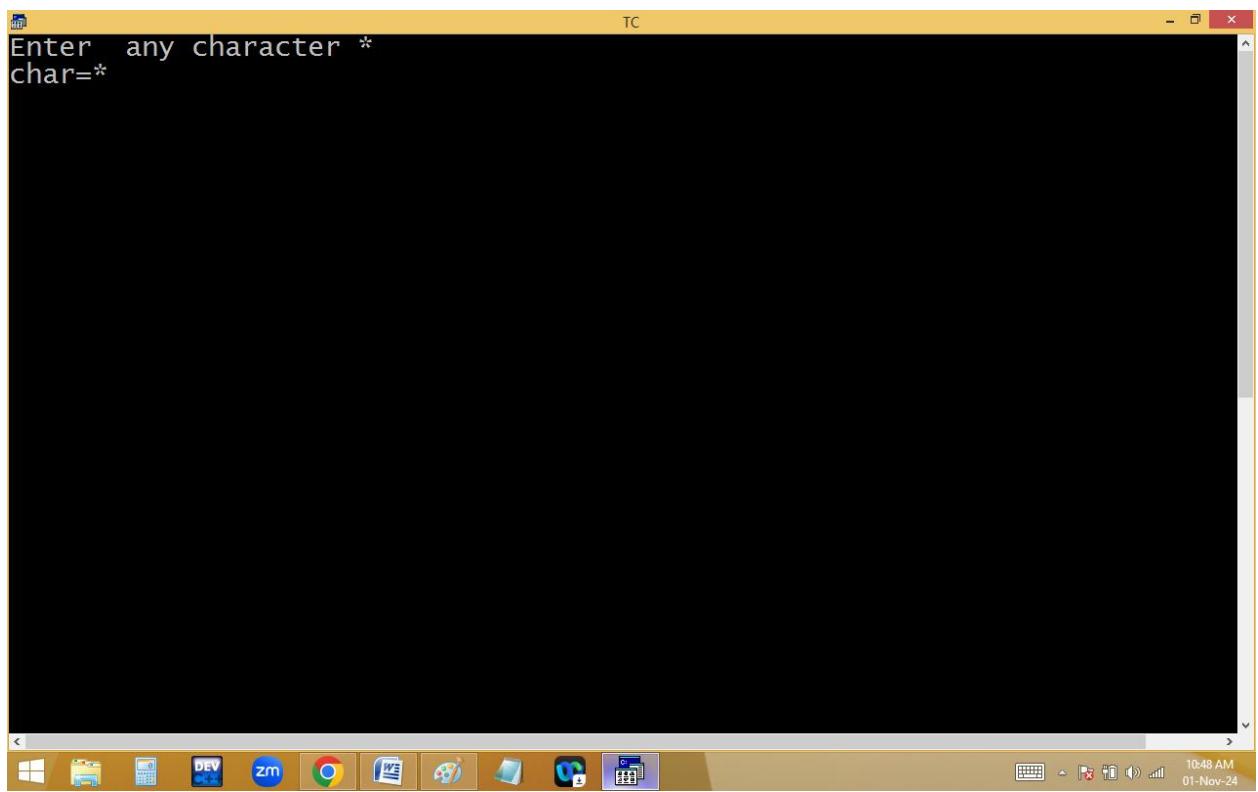
```
File Edit Run Compile Project Options Debug Break/watch
Line 10 Col 29 Insert Indent Tab Fill Unindent * E:9AM.C
```

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
    char ch;
    clrscr();
    printf("Enter any character ");
    scanf("%c",&ch);
    if(ch>='a' && ch<='z') ch=ch-32;
    else if(ch>='A' && ch<='Z') ch=ch+32;
    printf("char=%c",ch);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu | NUM

Windows taskbar icons: DEV, zm, Google Chrome, Paint, etc.

System tray: 10:48 AM, 01-Nov-24



Electricity bill generation:

SLAB SYSTEM

UNITS	UNIT PRICE
1-50	1.45
51-100	2.8
101-200	3.05
201-300	4.75
301-500	6.00
>500	6.25

$$30 \text{ UNITS} = 30 * 1.45 = 43.5$$

$$80 = 50 * 1.45 + (80 - 50) * 2.8 = 156.5$$

$$180 = 50 * 1.45 + 50 * 2.8 + 80 * 3.05 = 456.5$$

$$580 - 50 * 1.45 + 50 * 2.8 + 100 * 3.05 + 100 * 4.75 + 200 * 6 + 80 * 6.25 = 2692.5$$

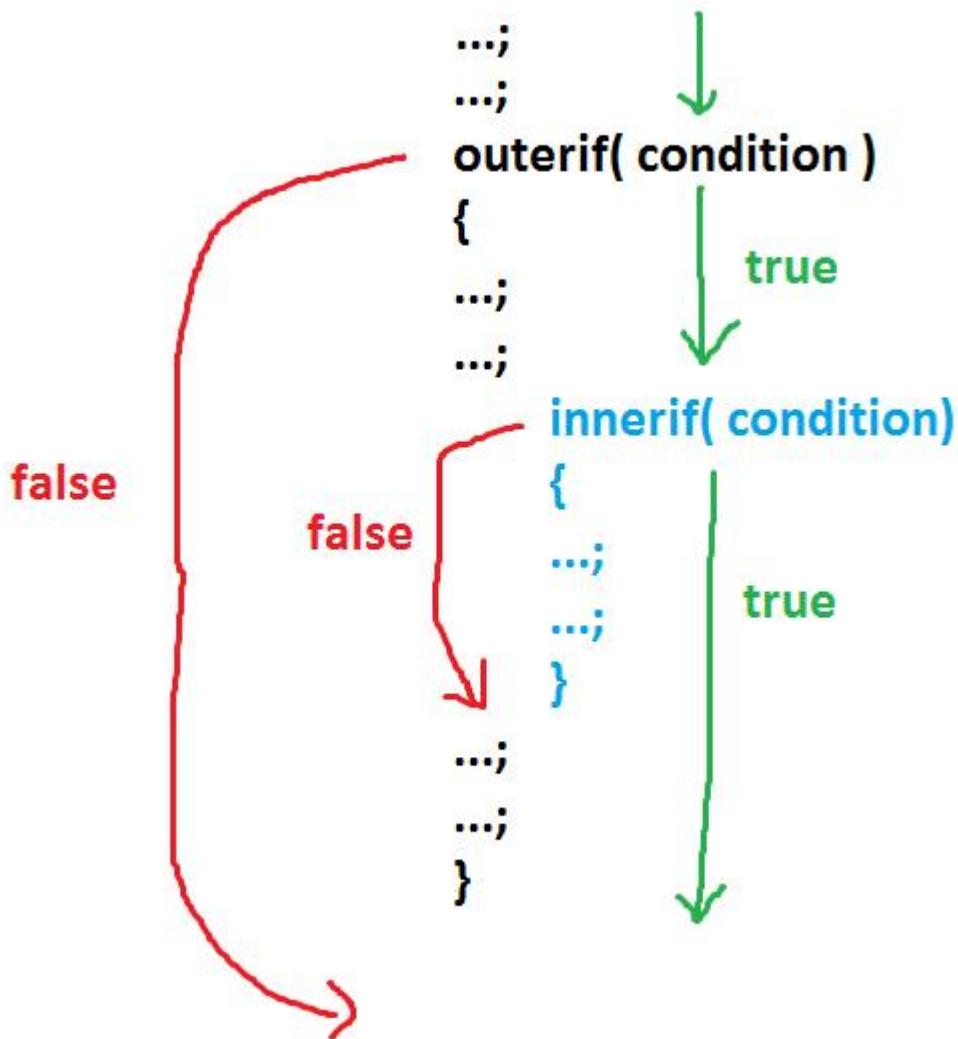
The screenshot shows a Microsoft Windows operating system interface. At the top is the Turbo C++ IDE window, which has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu is a status bar showing "Line 4 Col 44 Insert Indent Tab Fill Unindent * E:9AM.C". The code area contains C code for calculating electricity bills based on consumption units. The code includes declarations for stdio.h and conio.h, a main function, and logic for reading serial number, consumer name, previous month reading, current month reading, and calculating the amount based on different price tiers. The output window at the bottom shows the program's interaction with the user, including prompts for input and the resulting amount.

```
#include<stdio.h> #include<conio.h>
void main()
{
long serno,pre,cur,units; char name[20]; float amt;
clrscr();
printf("Enter serial no "); scanf("%ld",&serno);
printf("Enter consumer name "); scanf("%s",name);
printf("Enter previous month reading "); scanf("%ld",&pre);
current:
printf("Enter current month reading "); scanf("%ld",&cur);
if(cur<pre){puts("\aCheck current month reading"); goto current; }
units = cur - pre;
if(units<=50)amt=units*1.45;
else if(units<=100) amt=50*1.45+(units-50)*2.8;
else if(units<=200)amt=50*1.45+50*2.8+(units-100)*3.05;
else if(units<=300)amt=50*1.45+50*2.8+100*3.05+(units-200)*4.75;
else if(units<=500)amt=50*1.45+50*2.8+100*3.05+100*4.75+(units-300)*6;
else amt=50*1.45+50*2.8+100*3.05+100*4.75+200*6+(units-500)*6.25;
if(amt<50) amt=50;
printf("Amount=% .2f",amt);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter serial no 3
Enter consumer name Nishi
Enter previous month reading 1000
Enter current month reading 1000
Amount=50.00_

Nested if: If within another if is called nested if.



Read a person age and gender and determine that person is eligible for marriage or not?

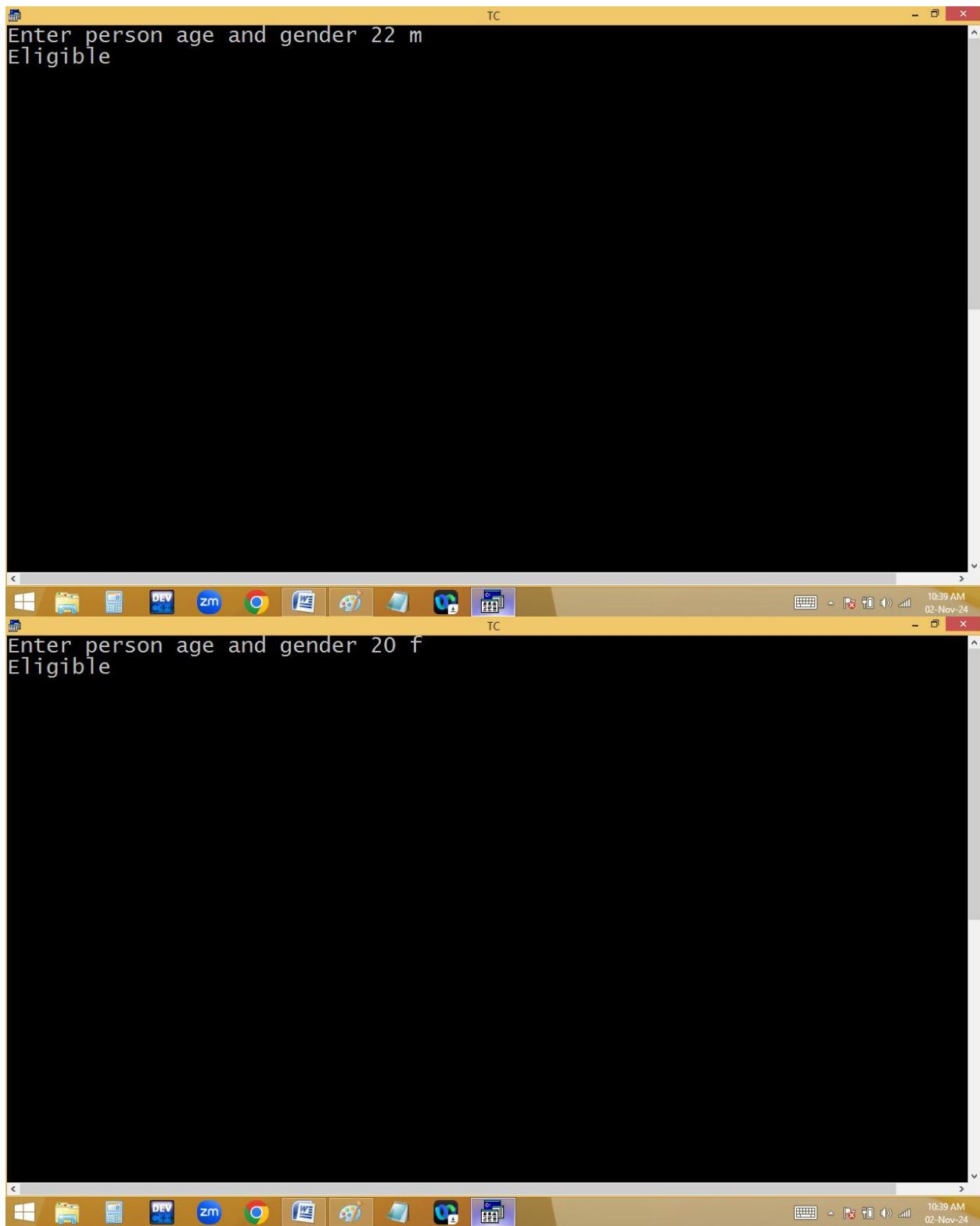
The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int age;
char gen;
clrscr();
printf("Enter person age and gender "); scanf("%d %c",&age,&gen);
if(gen=='m'|| gen=='M' || gen=='f'||gen=='F')
{
if(age>=21 || (gen=='f'|| gen=='F') && age>=18 ) puts("Eligible");
else puts("Not Eligible");
}
else puts("Invalid Gender");
getch();
```

The terminal window also shows the command prompt and the system tray at the bottom.

The terminal output is:

```
Enter person age and gender 25 t
Invalid Gender
```



```
TC
Enter person age and gender 20 m
Not Eligible

Enter person age and gender 17 f
Not Eligible
```

The image displays three separate windows from a Windows operating system, likely running a terminal or command-line application. Each window shows the same prompt and response sequence:

- The first window (top) has a yellow title bar labeled "TC". It displays the text "Enter person age and gender 20 m" followed by "Not Eligible".
- The second window (middle) has a yellow title bar labeled "TC". It displays the text "Enter person age and gender 17 f" followed by "Not Eligible".
- The third window (bottom) has a brown title bar labeled "TC". It displays the same text sequence.

The desktop environment includes a taskbar at the bottom with various pinned icons, including File Explorer, Task View, Edge browser, and others. The system tray shows the date and time as "10:39 AM 02-Nov-24".

ATM PIN validation:

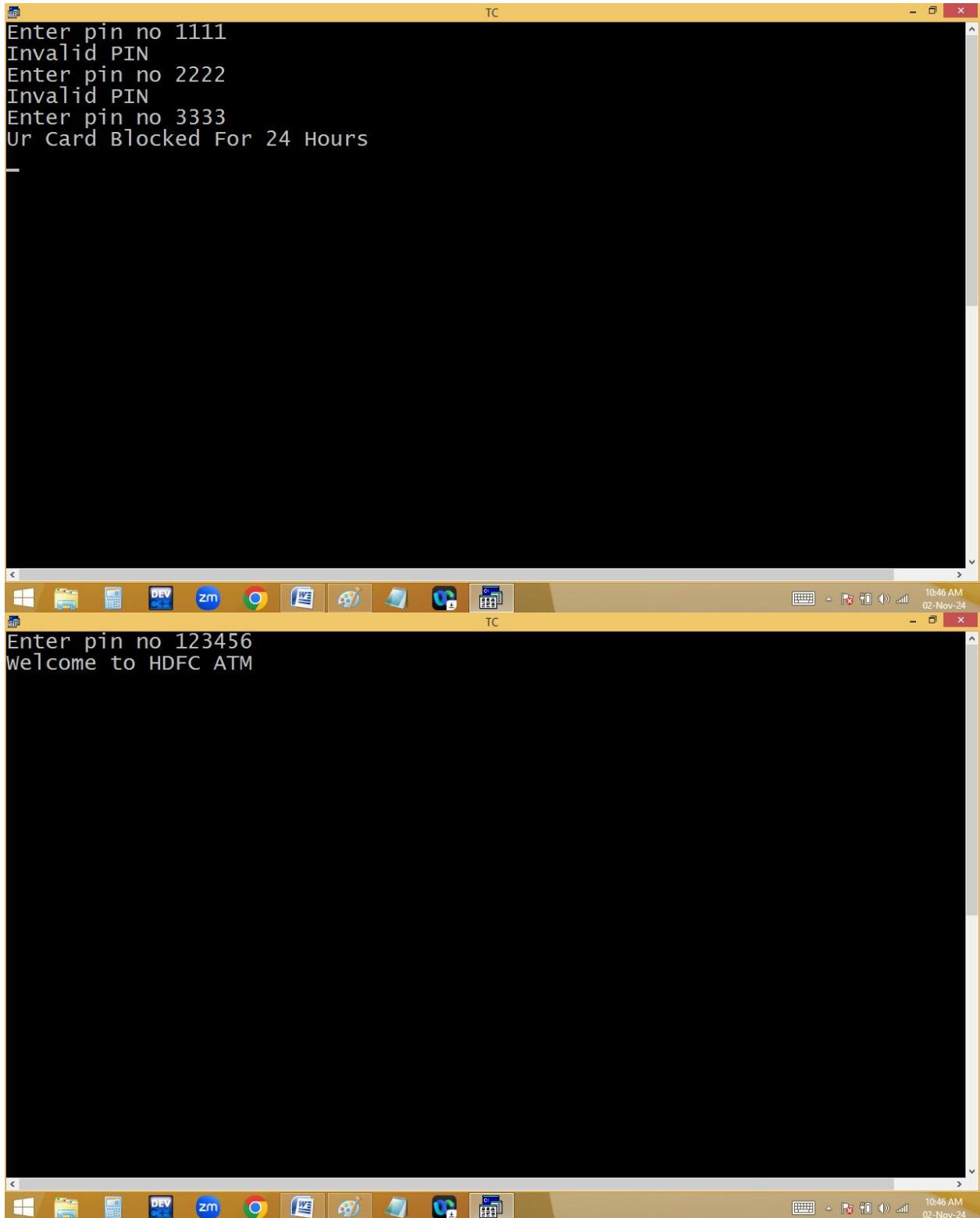
The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a yellow title bar labeled "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". The status bar at the bottom of the terminal window shows "Line 17 Col 9 Insert Indent Tab Fill Unindent * E:9AM.C".

```
#include<stdio.h>
#include<conio.h>
void main()
{
int pin,count=0;
clrscr();
start:
printf("Enter pin no ");
scanf("%4d",&pin);
if(pin==1234) puts("Welcome to HDFC ATM");
else
{
count++;
if(count==3)puts("Ur Card Blocked For 24 Hours");
else {puts("Invalid PIN"); goto start; }
}
getch();
}
```

The terminal window displays the following output:

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM
< >
Windows Taskbar icons: DEV, zm, Google Chrome, MS Word, Paint, File Explorer, Task View
TC
10:45 AM
02-Nov-24
Enter pin no 1234
Welcome to HDFC ATM
```

The taskbar at the bottom of the screen shows various application icons, including DEV, zm, Google Chrome, MS Word, Paint, File Explorer, and Task View. The system tray indicates the date and time as 10:45 AM on 02-Nov-24.



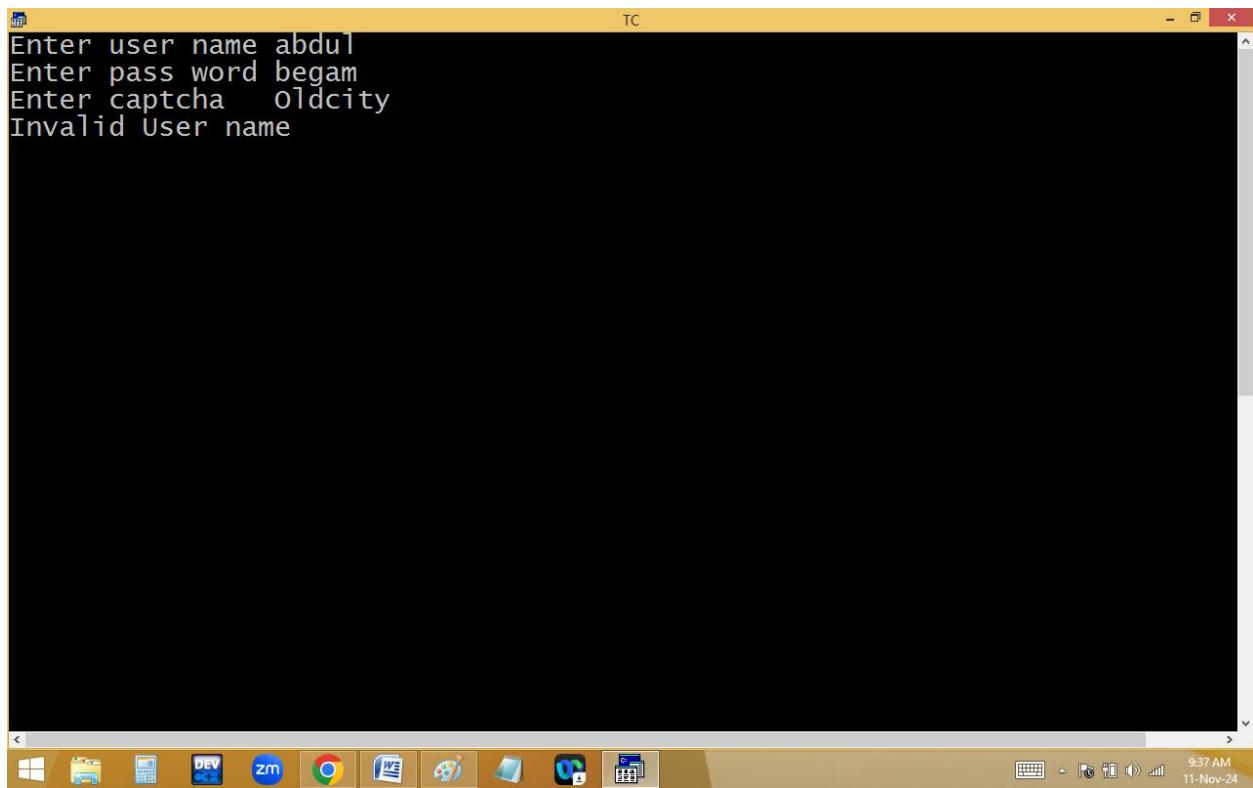
IRCTC Login:

The screenshot shows a terminal window titled "TC" running on a Windows operating system. The window displays a C program for logging into an IRCTC system. The code prompts for user name, password, and captcha, and checks if the user name is "Krish" and the password is "Indian". If the captcha is "Hyd-1", it prints "Welcome to IRCTC"; otherwise, it prints "Invalid Captcha". If the user name is invalid, it prints "Invalid User name". The terminal also shows the command-line interface with function keys F1-F10 and a numeric keypad.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char user[20],pass[20],cap[10];
clrscr();
printf("Enter user name "); scanf("%s",user);
printf("Enter pass word "); scanf("%s",pass);
printf("Enter captcha "); scanf("%s",cap);
if(strcmp(user,"Krish")==0)
{
    if(strcmp(pass,"Indian")==0)
    {
        if(strcmp(cap,"Hyd-1")==0)puts("Welcome to IRCTC");
        else puts("Invalid Captcha");
    }
    else puts("Invalid Pass word");
}
else puts("Invalid User name");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

```
Enter user name Krish
Enter pass word Indian
Enter captcha Hyd-1
Welcome to IRCTC
```



```
TC
Enter user name Krish
Enter pass word dfsdf
Enter captcha dsfsdf
Invalid Pass word

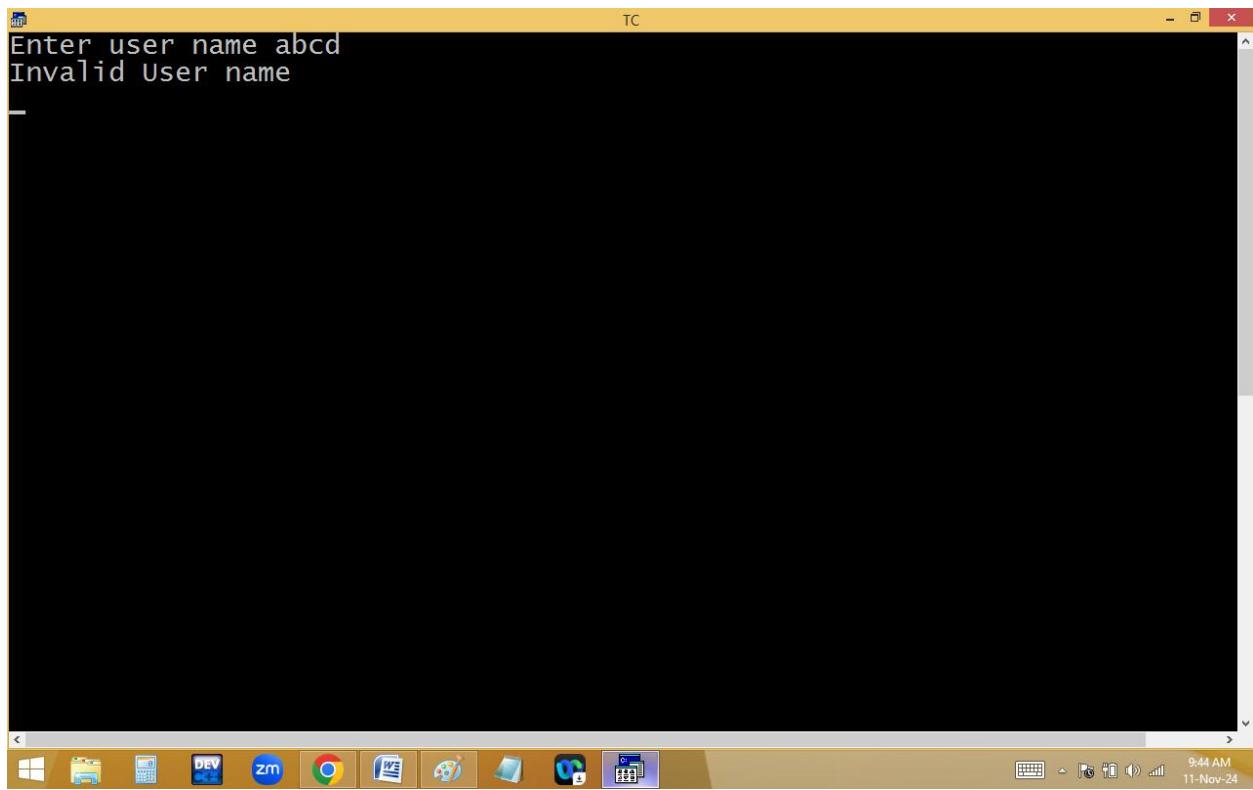
Enter user name Krish
Enter pass word Indian
Enter captcha xfgxdf
Invalid Captcha
```

Gmail style login:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run. The program prompts for user input and performs string comparisons to determine if the user is 'Krish' and the password is 'Indian'. If both conditions are met and the captcha is 'Hyd-1', it prints 'Welcome to Gmail'. Otherwise, it prints 'Invalid' messages. The terminal window also shows the system tray at the bottom.

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char user[20],pass[20],cap[10];
clrscr();
printf("Enter user name "); scanf("%s",user);
if(strcmp(user,"Krish")==0)
{
printf("Enter pass word "); scanf("%s",pass);
if(strcmp(pass,"Indian")==0)
{
printf("Enter captcha "); scanf("%s",cap);
if(strcmp(cap,"Hyd-1")==0)puts("Welcome to Gmail");
else puts("Invalid Captcha");
}
else puts("Invalid Pass word");
}
else puts("Invalid User name");
getch();
}
```

Enter user name Krish
Enter pass word Indian
Enter captcha Hyd-1
Welcome to Gmail



```
TC
Enter user name Krish
Enter pass word dsafsfdsf
Invalid Pass word

TC
Enter user name Krish
Enter pass word Indian
Enter captcha dfdsaf
Invalid Captcha

TC
Enter user name Krish
Enter pass word Indian
Enter captcha dfdsaf
Invalid Captcha
```

Net Banking style login:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program being run in Turbo C++.

The terminal window title bar reads "TC" and the status bar indicates "Line 12 Col 24 Insert Indent Tab Fill Unindent * E:9AM.C".

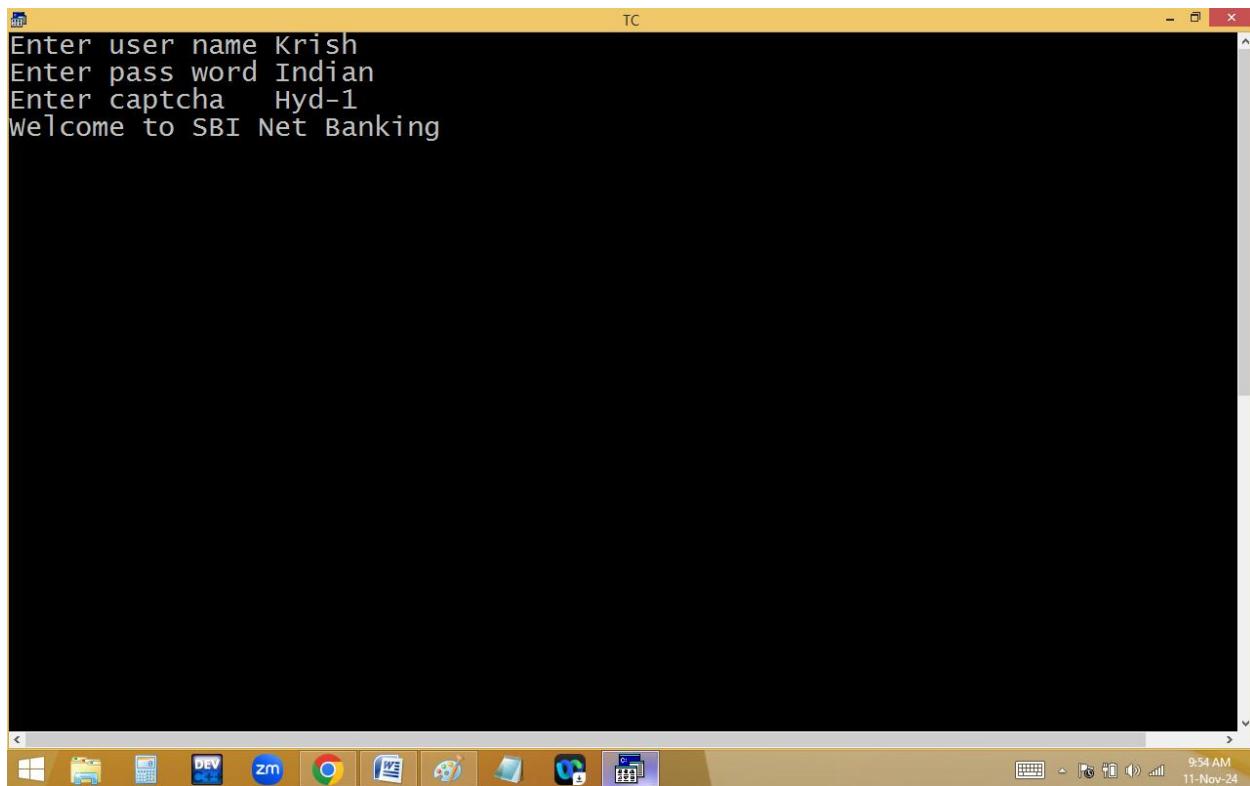
The C code is as follows:

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
    char user[20], pass[20], cap[10];
    clrscr();
    printf("Enter user name "); scanf("%s", user);
    printf("Enter pass word "); scanf("%s", pass);
    printf("Enter captcha "); scanf("%s", cap);
    if(strcmp(user, "Krish") == 0 && strcmp(pass, "Indian") == 0 &&
       strcmp(cap, "Hyd-1") == 0) puts("Welcome to SBI Net Banking");
    else puts("Invalid user name / pass word / Captcha");
    getch();
}
```

The terminal window also displays the output of the program:

```
Enter user name Krish
Enter pass word dfsd
Enter captcha Hyd-1
Invalid user name / pass word / Captcha
```

The desktop taskbar at the bottom shows various application icons, including a browser, file explorer, and system tray icons. The system tray shows the date and time as "9:54 AM 11-Nov-24".



Read a stu id, name, 6 sub marks. Find total, avg, grade using below table.

Avg	Grade
≥ 75	Distinction
≥ 60	First class
≥ 50	Second class
≥ 35	Third class
< 35	Fail

TC

```
File Edit Run Compile Project Options Debug Break/watch
Line 4 Col 67 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h> #include<conio.h>
void main()
{
int id,tel,eng,hin, mat, sci, soc, tot; char name[30]; float avg; clrscr();
printf("Enter stu id "); scanf("%d",&id);
flushall();
printf("Enter stu name ");
gets(name);
printf("Enter 6 sub marks ");
scanf("%d%d%d%d%d%d",&tel,&eng,&hin,&mat,&sci,&soc);
tot=tel+eng+hin+mat+sci+soc;
avg=tot/6.0;
printf("Id=%d, name=%s, Tot=%d, Avg=%.2f and Grade ",id,name,tot,avg);
if(tel>=35&&eng>=35&&hin>=35&&mat>=35&&sci>=35&&soc>=35)
{
if(avg>=75) puts("Distinction");
else if(avg>=60)puts("First Class");
else if(avg>=50)puts("Second Class");
else puts("Third Class");
}
else puts("Failed");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter stu id 1
Enter stu name kumari
Enter 6 sub marks 65 54 45 34 44 35
Id=1, name=kumari, Tot=277, Avg=46.17 and Grade Failed

10:17 AM 11-Nov-24

```
TC
Enter stu id 2
Enter stu name kumar
Enter 6 sub marks 45 50 45 43 36 40
Id=2, name=kumar, Tot=259, Avg=43.17 and Grade Third class

Enter stu id 3
Enter stu name Kishore Naidu
Enter 6 sub marks 88 78 90 98 89 90
Id=3, name=Kishore Naidu, Tot=533, Avg=88.83 and Grade Distinction
```

TC

```
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 10 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h> #include<conio.h>
void main()
{
int id,tel,eng,hin, mat, sci, soc, tot; char name[30]; float avg; clrscr();
printf("Enter stu id "); scanf("%d",&id); flushall();
printf("Enter stu name "); gets(name);
printf("Enter 6 sub marks ");
scanf("%d%d%d%d%d%d",&tel,&eng,&hin,&mat,&sci,&soc);
tot=tel+eng+hin+mat+sci+soc;
avg=tot/6.0;
puts("Id\tName\tTotal\tAvg\tGrade");
puts("-----");
printf("%d\t%s\t%d\t%.2f\t",id,name,tot,avg);
if(tel>=35&&eng>=35&&hin>=35&&mat>=35&&sci>=35&&soc>=35)
{
if(avg>=75) puts("Distinction");
else if(avg>=60)puts("First Class");
else if(avg>=50)puts("Second Class");
else puts("Third Class");
}
else puts("Failed");
getch(); }
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

```
Enter stu id 9
Enter stu name Gopi Krishna
Enter 6 sub marks 65 78 76 69 80 68
Id      Name      Total      Avg      Grade
-----
```

Id	Name	Total	Avg	Grade
9	Gopi Krishna	436	72.67	First Class

10:20 AM
11-Nov-24



TC

File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 13 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h> #include<conio.h>
void main()
{
int id,tel,eng,hin, mat, sci, soc, tot; char name[30]; float avg; clrscr();
printf("Enter stu id "); scanf("%d",&id); flushall();
printf("Enter stu name "); gets(name);
printf("Enter 6 sub marks ");
scanf("%d%d%d%d%d%d",&tel,&eng,&hin,&mat,&sci,&soc);
tot=tel+eng+hin+mat+sci+soc;
avg=tot/6.0;
printf("%-4s %-20s%6s%10s\tGrade\n","Id","Name","Total","Avg");
puts("-----");
printf("%-4d %-20s%6d\t%10.2f\t",id,name,tot,avg);
if(tel>=35&&eng>=35&&hin>=35&&mat>=35&&sci>=35&&soc>=35)
{
if(avg>=75) puts("Distinction");
else if(avg>=60)puts("First Class");
else if(avg>=50)puts("Second Class");
else puts("Third Class");
}
else puts("Failed");
getch(); }
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

Enter stu id 1
Enter stu name Krishna rao
Enter 6 sub marks 77 66 88 67 67 76

Id	Name	Total	Avg	Grade
1	Krishna rao	441	73.50	First class

10:28 AM 11-Nov-24

Finding even/odd using ternary operator?

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the following C code:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);

if(n%2==0)puts("Even");
else puts("Odd");

puts(n%2==0?"Even":"Odd");
getch();
}
```

Below the code, the terminal window shows the output of the program. It prompts the user to enter a number, receives the input '4', and then prints 'Even' twice. The terminal window has a menu bar at the top with options like File, Edit, Run, Compile, etc., and a status bar at the bottom showing the date and time.

The image shows a Microsoft Windows desktop environment with several windows open. At the top is a taskbar with icons for File Explorer, Control Panel, and other system tools. Below the taskbar is a terminal window titled 'TC' with a black background. It displays the following text:

```
Enter a no 5
Odd
Odd
```

Below the terminal is a code editor window also titled 'TC'. The menu bar includes 'File', 'Edit', 'Run', 'Compile', 'Project', 'Options', 'Debug', and 'Break/watch'. The status bar at the bottom of the code editor shows 'Line 12 Col 9 Insert Indent Tab Fill Unindent * E:9AM.C'. The code itself is:#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);

if(n%2)puts("odd");
else puts("Even");

puts(n%2?"Odd":"Even");
getch();
}

At the bottom of the screen is another taskbar with various application icons and system status indicators.

The image shows three vertically stacked windows, each representing a separate command-line session. Each window has a title bar labeled 'TC' and a dark blue background.

- Top Window:** Displays the text "Enter a no 3" followed by two lines of output: "Odd" and "Odd".
- Middle Window:** Displays the text "Enter a no 4" followed by two lines of output: "Even" and "Even".
- Bottom Window:** This window is mostly blank, with only the title bar and a few pixels of the background visible.

The windows are set against a background of a Windows desktop environment. The taskbar at the bottom of the screen contains several icons, including the Start button, File Explorer, Task View, and various application icons like DEV, zm, Google Chrome, and Microsoft Edge. The system tray shows the date and time as "10:33 AM 11-Nov-24".

Ternary / Conditional operator(?:)

It is similar to if else / ladder if in working style.

It allows to complete if else / ladder if in a single statement.

When we are working with if else/ladder if it is going to take more than one line of statements. Ternary operator is going to finish the same task in a single statement.

But the difference between if ...else and ternary operator is ternary operator supports only one statement at a time and if supports any number of statements.

It is having 3 expressions. Hence it is called ternary operator.

It is starting with a condition. Hence it is called conditional operator.

Syntax:

condition ? true statement : false statement ;
exp1/op1 exp2/op2 exp3/op3

If condition true, statement after ? executed.

If condition false, statement after : is executed.

When compared with if else, conditional operator **performance is high**.

Finding max in 2 no's using single statement/ternary op:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays the output of a C program. The program code is as follows:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b;
clrscr();
printf("Enter a, b values ");
scanf("%d %d",&a,&b);
if(a>b)puts("a is big"); else puts("b is big");
puts(a>b?"a is big": "b is big");
if(a>b)puts("a is big");else if (b>a)puts("b is big");
else puts("Both are equal");
puts(a>b?"a is big":b>a?"b is big":"Both are equal");
getch();
}
```

The terminal window also displays the system menu bar at the top and the taskbar at the bottom, which includes icons for various applications like File Explorer, Google Chrome, and Paint.

The terminal output is:

```
Enter a, b values 3 3
b is big
b is big
Both are equal
Both are equal
```

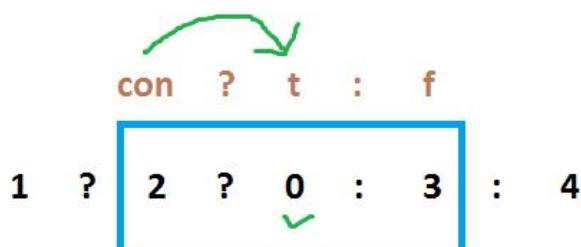
```
TC
Enter a, b values 4 5
b is big

TC
Enter a, b values 6 2
a is big
a is big
a is big
a is big
```

A screenshot of a Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window has a menu bar at the top with options: File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. Below the menu bar, status information is displayed: Line 8, Col 24, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The main body of the terminal contains the following C code:

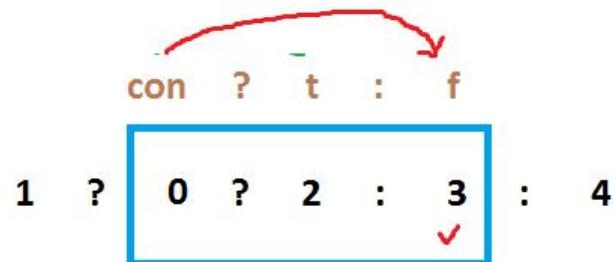
```
#include<stdio.h>
#include<conio.h>
void main()
{
    clrscr();
    printf("%d\n", 1?2?0:3:4);
    printf("%d\n", 1?0?2:3:4);
    printf("%d", 0?1?2:3:4);
    getch();
}
```

The output of the program is visible in the terminal window, showing the numbers 0, 3, and 4 on separate lines. The terminal window is surrounded by a window frame with standard minimize, maximize, and close buttons. Below the terminal window is a taskbar with several icons, including the Start button, File Explorer, Task View, DEV, ZM, Google Chrome, Microsoft Edge, Paint, File Explorer, and File Explorer. The system tray shows the date and time as 10:39 AM 11-Nov-24.



con ? true : false

```
if( 1 )
{
    if( 2 ) p( 0 );
    else p( 3 );
}
else p( 4 );
```



con ? true : false

```
if( 1 )
{
    if( 0 ) p( 2 );
    else p( 3 );
}
else p( 4 );
```



con ? true : false

```
if( 0 )
{
    if( 1 ) p( 2 );
    else p( 3 );
}
else p( 4 );
```


SWITCH

It is a selection statement.

It is used to execute one case of statements from no of cases according to the switch expression value matched with case expression value. In switch the program is jumped to matching case like the go to label.

It is similar to ladder if in working style.

Switch performance is high when compared with ladder if because of it jumps to matching case.

Syntax:

switch(**condition / expression**)

{

case **constexp1**:

statements;

break;

case **constexp2**:

statements;

break;

case **constexpN**:

statements;

break;

[**default**: statements;]

}

Here switch, case, break, default are the keywords.

In between case and case expression / value at least one space should be provided. **Otherwise it will become a label.**

case expression/value should be a **constant integer/char value**. i.e. float / string not allowed.

One case contains one expression only.

case expression doesn't contain any separators like , . etc.

case expression should be end with : (colon)

Each case should be separated with break keyword.
Otherwise remaining cases also executed.

Duplicate cases not allowed.

default is similar to the else and all cases are failed then default statements are executed. Default is optional and we can declare it anywhere in our switch.

Outside case expressions not considered in switch.

1. case value should be a const int.
2. float / strings not allowed.
3. var not allowed.
4. dup not allowed.
5. break is optional
6. default optional.
7. range of values not
8. , , not allowed.
9. outside case exp not considered.
10. switch / case / break / default
11. case and case value should be separated with min 1 space.
12. if no space provided it is converted into a label.
13. every case should have to end with :

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message at the top states "Error: Expression syntax in function main". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch()
default: puts("Hi");
getch();
}
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar below the window shows various application icons.

The screenshot shows the Turbo C IDE interface after the code has been corrected. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top displays "Line 9 Col 19 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is now valid:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch(1);
getch();
}/* blank screen */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar below the window shows various application icons.

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Default outside of switch in function main" is displayed at the top. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
default: puts("Hi");
getch();
}
/* Error */
```

The status bar at the bottom shows keyboard and system icons, and the date and time: 10:02 AM 12-Nov-24.

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Case outside of switch in function main" is displayed at the top. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
case 1: puts("Hi");
getch();
}
/* Error */
```

The status bar at the bottom shows keyboard and system icons, and the date and time: 10:02 AM 12-Nov-24.

A screenshot of the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "Line 9 Col 6 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
case1: puts("Hi");
getch();
}
/* Hi */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar shows various application icons, and the system tray indicates the date and time as 10:03 AM, 12-Nov-24.

A screenshot of the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "TC". The code editor displays the same C code as the first screenshot, but with a red error message at the top: "Error: Misplaced break in function main". The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar shows various application icons, and the system tray indicates the date and time as 10:04 AM, 12-Nov-24.

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Misplaced break in function main" is displayed at the top. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 0 )
case 1: puts("Hi");break;
getch();
}
/* Error */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, NUM, and a date/time stamp of 10:06 AM 12-Nov-24.

The screenshot shows the Turbo C IDE interface after the error has been fixed. The menu bar and status bar are identical to the first screenshot. The code editor now displays the following corrected C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 0 )
{
default: puts("Bye");
case 1: puts("Hi");break;
}
getch();
}
/* Bye
Hi */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, NUM, and a date/time stamp of 10:07 AM 12-Nov-24.

A screenshot of the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "Line 12 Col 4 TC E:9AM.C". The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 0 )
{
case 1: puts("Hi");break;
}
getch();
}/* Blank screen */
```

The status bar at the bottom shows keyboard and system icons.

A screenshot of the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the top shows "Error: Constant expression required in function main". The code editor contains the same C code as the first screenshot, but the line "case 1: puts("Hi");break;" is highlighted in red, indicating a syntax error. The status bar at the bottom shows keyboard and system icons.

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 top indicates Line 13, Col 19, and the file E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( '0' )
{
case 0: puts("Hi");break;
}
getch();
}/* Blank screen */
```

The F10-MENU key is highlighted in the keyboard status bar at the bottom.

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 top indicates Line 14, Col 7, and the file E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 0 )
{
case0: puts("Hi");break;
default: puts("Bye");
}
getch();
}/* Bye */
```

The F10-MENU key is highlighted in the keyboard status bar at the bottom.

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Duplicate case in function main" is displayed at the top. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 0 )
{
case 0: puts("Hi");break;
case 5%5: puts("Hi");break;
default: puts("Bye");
}
getch();
}/* Error */
```

The status bar at the bottom shows keyboard, mouse, and system icons, along with the time "10:11 AM" and date "12-Nov-24".

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Expression syntax in function main" is displayed at the top. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 3 )
{
case >1: puts("Hi");break;
case <1: puts("Hello");break;
default: puts("Bye");
}
getch();
}/* Error */
```

The status bar at the bottom shows keyboard, mouse, and system icons, along with the time "10:13 AM" and date "12-Nov-24".

The screenshot shows the Turbo C IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A red error message "Error: Duplicate case in function main" is displayed at the top. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 2 )
{
case 1+1: puts("Hi");break;
case 5/2: puts("Hello");break;
default: puts("Bye");
}
getch();
}/* Error */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, NUM, and the date/time 10:14 AM 12-Nov-24.

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 top displays Line 9, Col 9, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 2 )
{
case 1-3: puts("Hi");break;
case 5-3: puts("Hello");break;
default: puts("Bye");
}
getch();
}/* Hello */
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, NUM, and the date/time 10:16 AM 12-Nov-24.

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 top indicates Line 14, Col 7, and the file E:9AM.C. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 10||20 )
{
case 10: puts("Hi");break;
case 20: puts("Hello");break;
default: puts("Bye");
}
getch();
}
/* Bye_ */
```

The status bar at the bottom shows keyboard, mouse, and system icons, along with the time 10:18 AM and date 12-Nov-24.

The screenshot shows the Turbo C IDE interface after compilation. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. A prominent red error message "Error: Duplicate case in function main" is displayed in the status bar at the top. The code editor contains the same C code as the previous screenshot, with the error message appearing above the code area. The status bar at the bottom shows keyboard, mouse, and system icons, along with the time 10:20 AM and date 12-Nov-24.

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 top indicates Line 14, Col 9, TC, and E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
switch( 10,20 )
{
case 10: puts("Hi");break;
case 20: puts("Hello");break;
default: puts("Bye");
}
getch();
}
/* Hello */
```

The F10-MENU button is highlighted in the menu bar. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:22 AM, 12-Nov-24.

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 top indicates Error: Constant expression required in function main, TC, and E:9AM.C. The code editor contains the same C program as the first screenshot, but the line "switch(10,20)" is highlighted in red, indicating a syntax error. The F10-MENU button is highlighted in the menu bar. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:23 AM, 12-Nov-24.

```

File Edit Run Compile Project Options Debug Break/watch
Line 15 Col 9 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=97, b=98;
clrscr();
switch( a,b )
{
case 'a': puts("Hi");break;
case 'b': puts("Hello");break;
default: puts("Bye");
}
getch();
}
/* Hello */

```

```

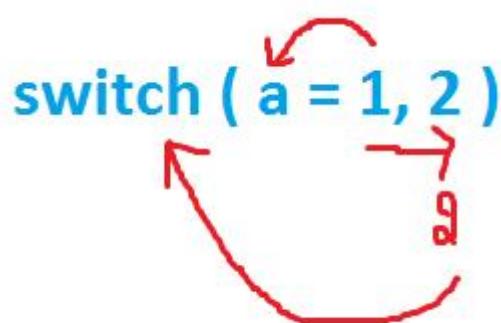
File Edit Run Compile Project Options Debug Break/watch
Line 18 Col 7 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a=1 )
{
a=2;
case 0: puts("Hi");break;
case 1: puts("Hello");break;
default: puts("Bye");
}
printf("a=%d",a);
getch();
}
/* Hello
   a=1 */

```

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 top indicates Line 16, Col 7, and the file E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a=1,2 )
{
case 0: puts("Hi");break;
case 1: puts("Hello");break;
default: puts("Bye");
}
printf("a=%d",a);
getch();
}
/* Bye
a=1 */
```

The status bar at the bottom shows keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. The taskbar below the window shows various application icons, and the system tray indicates the date and time as 10:27 AM, 12-Nov-24.



```

File Edit Run Compile Project Options Debug Break/watch
Line 17 Col 7 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a=(1,2),0 )
{
case 0: puts("Hi");break;
case 1: puts("Hello");break;
default: puts("Bye");
}
printf("a=%d",a);
getch();
}
/* Hi
a=2 */

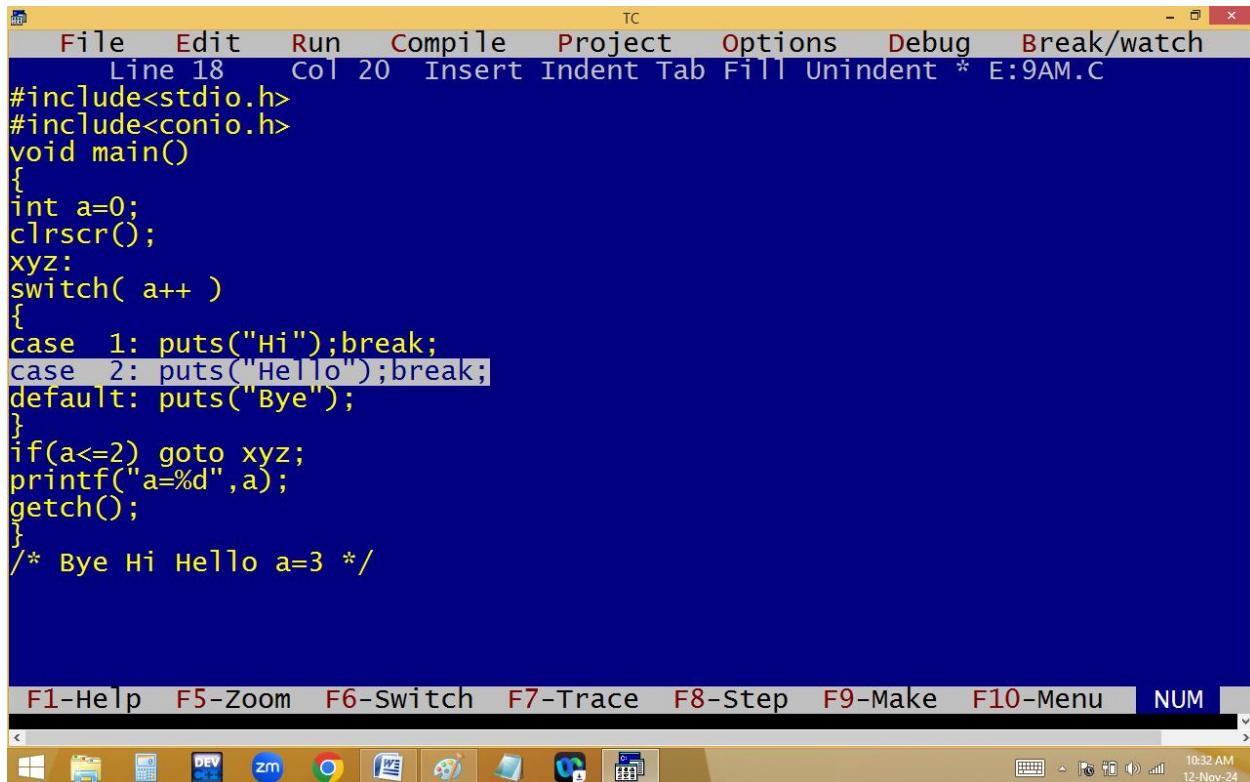
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

10:29 AM 12-Nov-24

switch (a=(1, 2), 0)

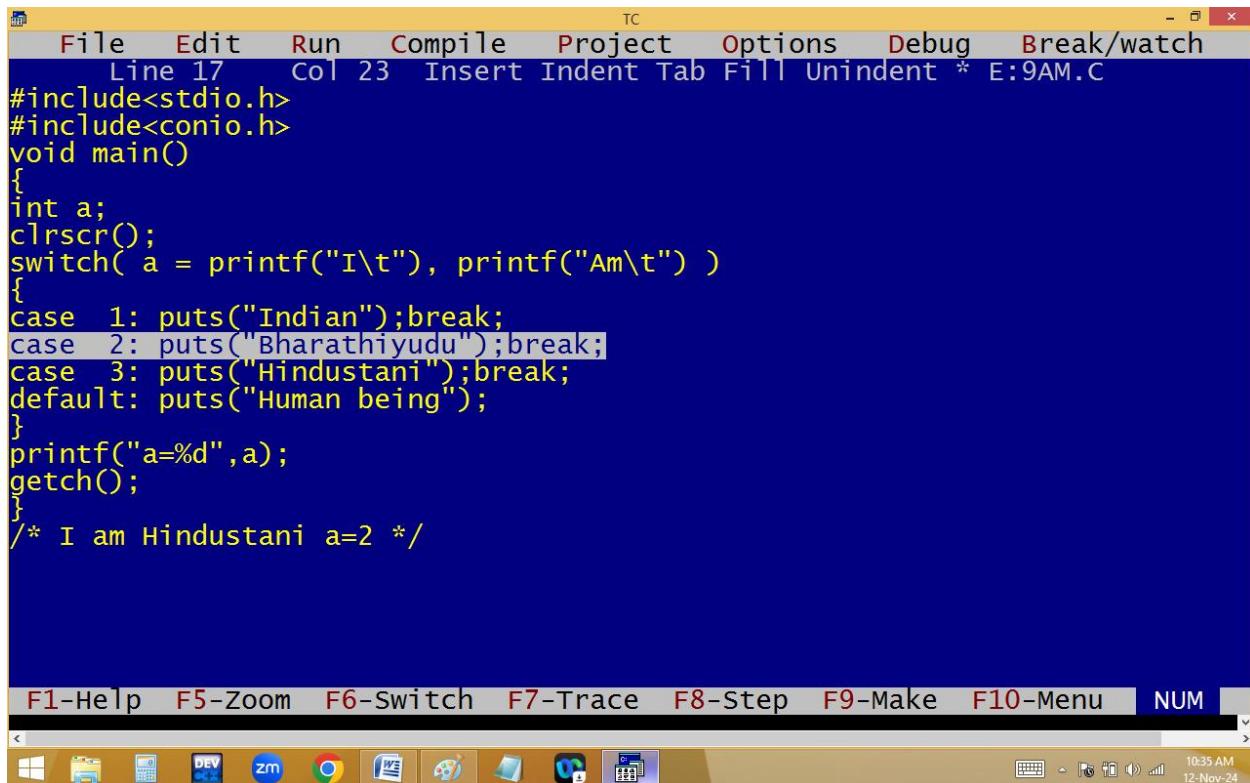




```

File Edit Run Compile Project Options Debug Break/watch
Line 18 Col 20 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
xyz:
switch( a++ )
{
case 1: puts("Hi");break;
case 2: puts("Hello");break;
default: puts("Bye");
}
if(a<=2) goto xyz;
printf("a=%d",a);
getch();
}
/* Bye Hi Hello a=3 */

```



```

File Edit Run Compile Project Options Debug Break/watch
Line 17 Col 23 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
switch( a = printf("I\t"), printf("A\t") )
{
case 1: puts("Indian");break;
case 2: puts("Bharathiyudu");break;
case 3: puts("Hindustani");break;
default: puts("Human being");
}
printf("a=%d",a);
getch();
}
/* I am Hindustani a=2 */

```

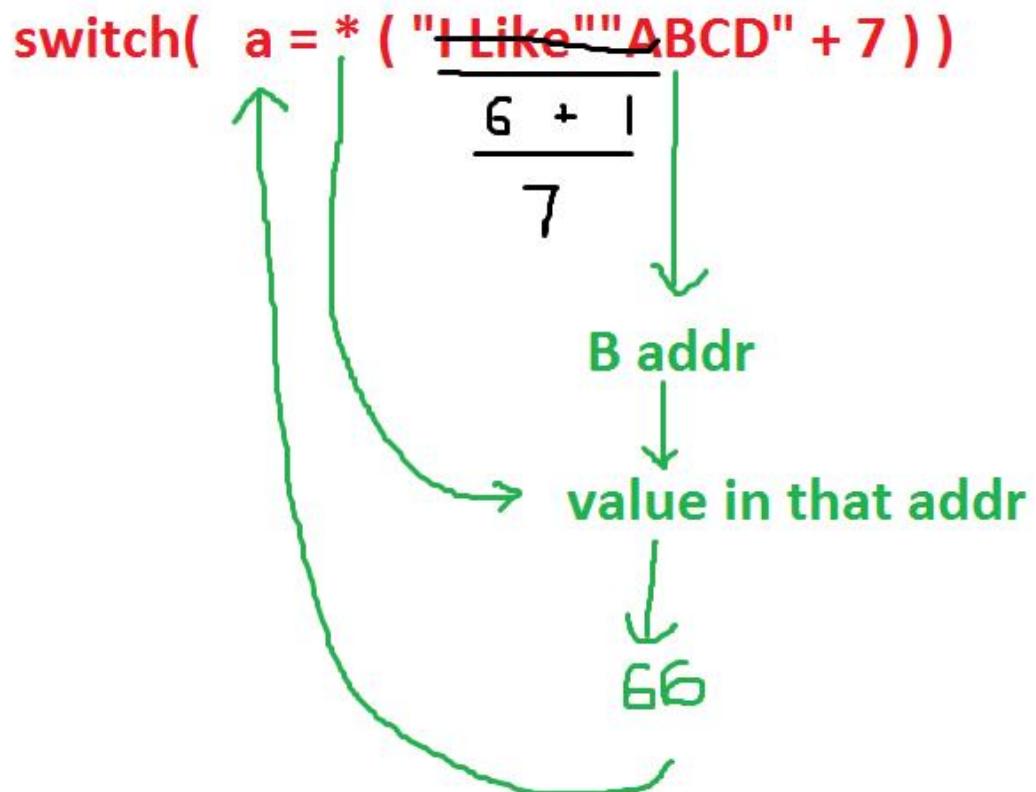
switch (a = p("I\t"), p("Am\t"))

a = 2, 3

```

TC
File Edit Run Compile Project Options Debug Break/watch
Line 17 Col 20 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int a;
clrscr();
switch( a = * ( "I Like""ABCD"+7 ) )
{
case 65: puts("Alia Bhatt");break;
case 66: puts("Pooja Hegde");break;
case 67: puts("Jhanvi Kapoor");break;
default: puts("Shraddha Kapoor");
}
printf("a=%d",a);
getch();
}
/* Pooja Hegde a=66 */

```



The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a++ )
{
case 0: puts("Alia Bhatt");break;
switch(a++)
{
case 1: puts("Pooja Hegde");break;
default: puts("Jhanvi Kapoor");
}
default: puts("Shraddha Kapoor");
}
getch();
}
```

The terminal window also shows the output of the program, which is "Alia Bhatt". The desktop taskbar at the bottom contains icons for various applications, including a browser, email, and file management tools. The system tray shows the date and time as 9:20 AM on 13-Nov-24.

TC

File Edit Run Compile Project Options Debug Break/watch

Error: Misplaced continue in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a++ )
{
case 0: puts("Alia Bhatt");continue;
switch(a++)
{
case 1: puts("Pooja Hegde");break;
default: puts("Jhanvi Kapoor");
}
default: puts("Shraddha Kapoor");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu



9:21 AM
13-Nov-24

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a++ )
{
case 0: puts("Alia Bhatt");
switch(a++)
{
case 1: puts("Pooja Hegde");break;
default: puts("Jhanvi Kapoor");
}
default: puts("Shraddha Kapoor");
}
getch();
}
```

Below the code, the terminal window displays the output of the program:

```
Alia Bhatt
Pooja Hegde
Shraddha Kapoor
```

The desktop taskbar at the bottom shows various icons for applications like File Explorer, Task View, Control Panel, and others. The system tray indicates the date as 13-Nov-24 and the time as 9:22 AM.

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a++ )
{
case 0: puts("Alia Bhatt");
switch(a++)
{
case 1: puts("Pooja Hegde");
default: puts("Jhanvi Kapoor");
}
default: puts("Shraddha Kapoor");
}
getch();
}
```

Below the code, the terminal window displays the output of the program:

```
Alia Bhatt
Pooja Hegde
Jhanvi Kapoor
Shraddha Kapoor
```

The desktop taskbar at the bottom shows various application icons, including DEV, zm, Google Chrome, and Microsoft Edge. The system tray indicates the date as 13-Nov-24 and the time as 9:23 AM.

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 top right indicates Line 10, Col 36, and the file E:9AM.C. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
switch( a++ || a++ || a++ )
{
case 0: puts("Alia Bhatt");break;
case 1: puts("Pooja Hegde");break;
default: puts("Jhanvi Kapoor");
}
printf("a=%d",a);
getch();
}
```

The status bar at the bottom provides keyboard shortcuts: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10-Menu. The taskbar at the bottom shows various application icons, and the system tray displays the date and time (9:24 AM, 13-Nov-24).

a=0;

~~a=0;~~

switch(a++ || a++ || a++)

|

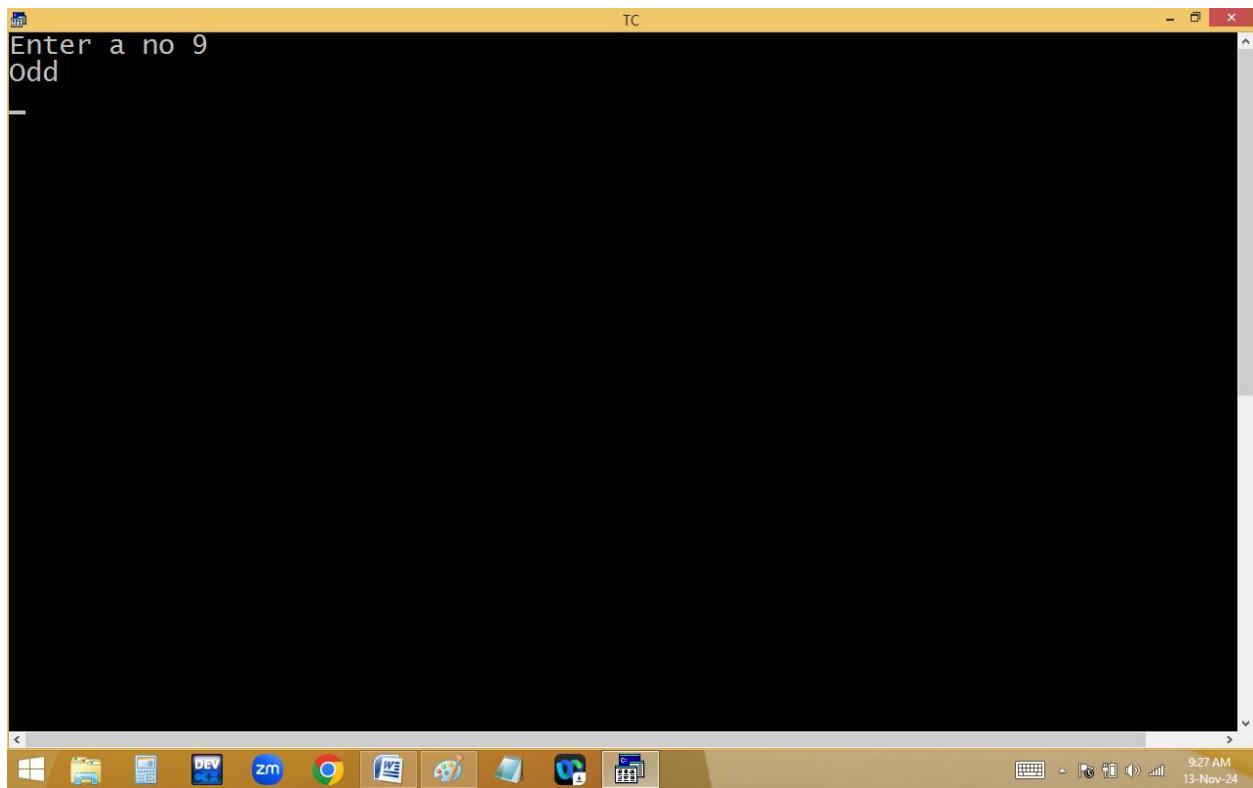
Finding even/odd using switch:

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 indicates Line 13, Col 1, TC, and E:9AM.C. The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
switch( n%2 )
{
case 0: puts("Even");break;
default: puts("Odd");
}
getch();
}
```

The terminal window below shows the output of the program. The user enters "8" and the program outputs "Even".

```
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu
Enter a no 8
Even
```



```
Enter a no 9
Odd
```

Finding weekday name:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program and its execution output.

Terminal Window Content:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 30 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter day no between 1-7 "); scanf("%d",&n);
switch( n )
{
case 1: puts("Sunday");break;
case 2: puts("Monday");break;
case 7: puts("Saturday");break;
default: puts("Invalid day no");
}
getch();
}
```

Terminal Window Status Bar:

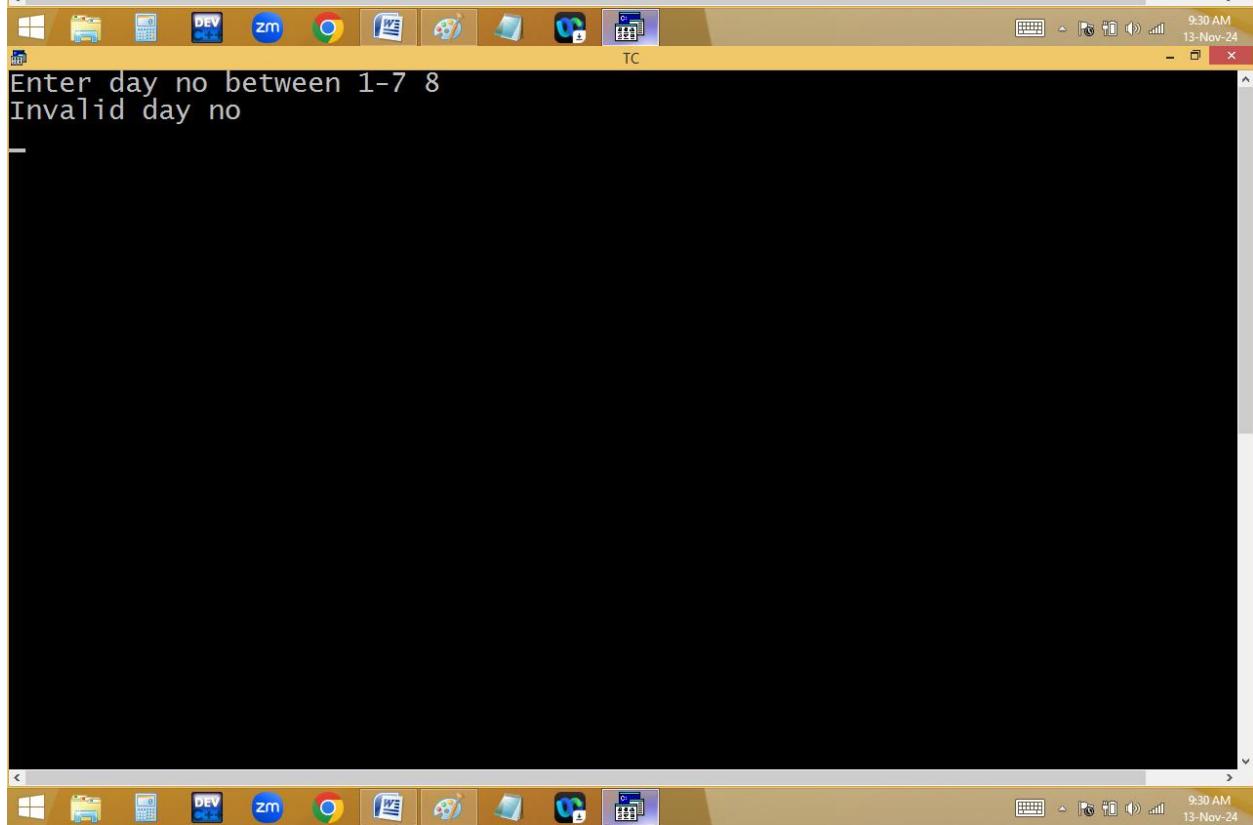
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu

Windows Taskbar:

Windows Start button, File Explorer, Control Panel, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Task View, Task Manager, System, Taskbar icons for various applications like Mail, Photos, and Calendar, and system status icons for battery, signal, and date/time (9:30 AM, 13-Nov-24).

```
TC
Enter day no between 1-7 7
Saturday

Enter day no between 1-7 8
Invalid day no
```

The image shows a Windows desktop environment with three separate windows stacked vertically. Each window has a yellow title bar with the letters 'TC'. The first window displays the text 'Enter day no between 1-7 7' followed by 'Saturday'. The second window displays 'Enter day no between 1-7 8' followed by 'Invalid day no'. The third window is completely blank. Below these windows is a standard Windows taskbar. On the taskbar, there are several pinned icons: a Start button, File Explorer, Task View, a blue folder icon labeled 'DEV', a blue square icon labeled 'zm', Google Chrome, Microsoft Edge, a green square icon labeled 'WF', a blue square icon labeled 'PAINT', a blue square icon labeled 'WORD', a blue square icon labeled 'POWERPOINT', and a blue square icon labeled 'EXCEL'. To the right of the taskbar is the system tray, which includes icons for keyboard, mouse, battery, signal strength, and the date and time (9:30 AM, 13-Nov-24).

Finding vowel/consonant using switch:

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window title is "TC" and it displays the following C code:

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 1 Col 2 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter the character ");
scanf("%c",&ch);
if(ch>='A'&&ch<='Z')ch+=32; /* lower */
if( ch>='a' && ch<='z')
{
switch( ch )
{
case 'a': case 'e': case 'i': case 'o': case 'u': puts("Vowel");break;
default: puts("Consonant");
}
}
else if(ch>='0'&&ch<='9')puts("Digit");
else puts("Special char");
getch();
}
```

The terminal window also shows the output of the program:

```
Enter the character
Special char
```

The desktop background is white, and the taskbar at the bottom shows various application icons.

```
TC
Enter the character E
Vowel
```

```
TC
Enter the character y
Consonant
```

```
Enter the character  9
Digit
-
```

```
Enter the character  $
Special char
-
```

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a dark blue background and displays a C program. The code uses standard input-output functions like `stdio.h` and `conio.h`. It checks if the input character is uppercase or lowercase and then determines if it's a vowel ('a', 'e', 'i', 'o', 'u') or a consonant. If the character is a digit ('0'-'9'), it prints "Digit". Otherwise, it prints "Special char". The user enters the character 'i', which is identified as a vowel.

```
#include<stdio.h>
#include<conio.h>
void main()
{
char ch;
clrscr();
printf("Enter the character  ");
scanf("%c",&ch);
if(ch>='A'&&ch<='Z')ch+=32; /* lower */
if( ch>='a' && ch<='z')
{
switch(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' )
{
case 1: puts("Vowel");break;
default: puts("Consonant");
}
}
else if(ch>='0'&&ch<='9')puts("Digit");
else puts("Special char");
getch();
}
```

Terminal Output:

```
Enter the character i
Vowel
```

The image shows three separate Windows desktop sessions, each with a terminal window open. The top two windows are black and the bottom one is white.

Top Window:

```
Enter the character  5
Digit
```

Middle Window:

```
Enter the character  r
Consonant
```

Bottom Window:

```
TC
```

The taskbars at the bottom of each window show various icons for applications like File Explorer, Control Panel, and system tools. The date and time (9:52 AM, 13-Nov-24) are also visible on the right side of the taskbar in the middle and bottom windows.

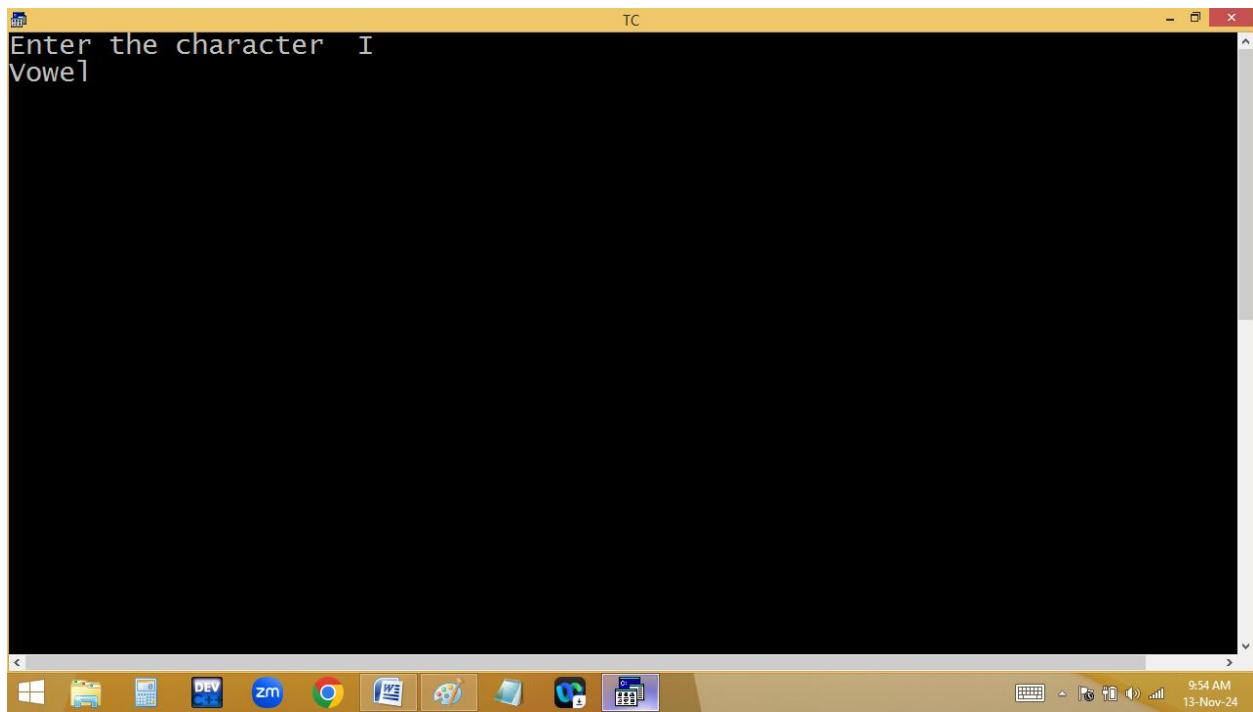
Using predefined functions:

The image shows a screenshot of a Windows operating system desktop. At the top, there is a taskbar with various icons for applications like File Explorer, Control Panel, and Internet Explorer. The main focus is a terminal window titled "TC" which displays a C program. The code uses standard input/output functions from stdio.h and ctype.h to determine if a character is a vowel, consonant, digit, or special character. The terminal window shows the output of the program when the character 'H' is entered.

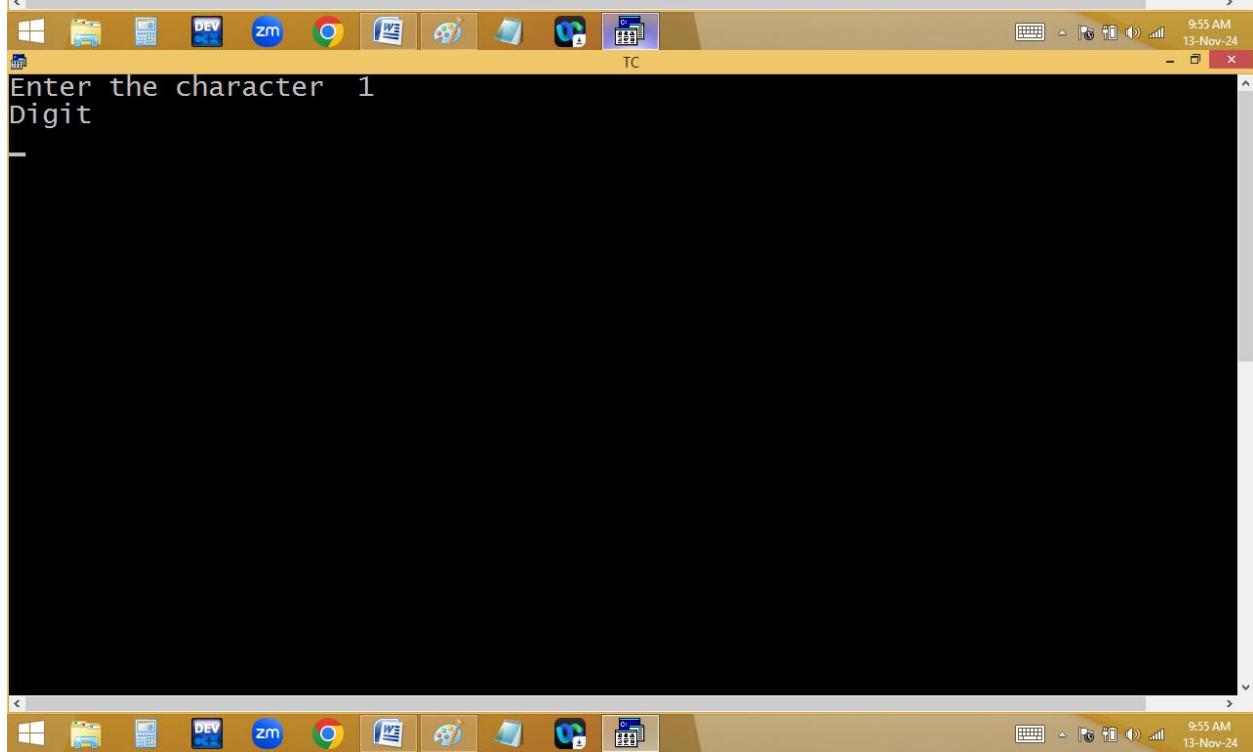
```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char ch;
clrscr();
printf("Enter the character  ");
scanf("%c",&ch);
ch=tolower(ch);
if( isalpha(ch))
{
switch(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' )
{
case 1: puts("Vowel");break;
default: puts("Consonant");
}
}
else if(isdigit(ch))puts("Digit");
else puts("Special char");
getch();
}
```

Terminal Output:

```
Enter the character H
Consonant
```



```
TC
Enter the character *  
Special char  
-  
  
TC
Enter the character 1  
Digit  
-  
  
TC
Enter the character 1  
Digit  
-
```

The image shows three separate windows stacked vertically, each with a black background and white text. The top window is titled 'TC' and contains the message 'Enter the character *' followed by 'Special char'. The middle window is also titled 'TC' and contains the message 'Enter the character 1' followed by 'Digit'. The bottom window is also titled 'TC' and contains the same messages. Below these windows is a Windows taskbar with several icons, including a calculator, a browser, and a file manager. The taskbar also displays the date and time as '9:55 AM 13-Nov-24'.

Create a hotel menu program for billing:

**HOTEL SAIKRISH
AMEERPET-HYD**

- 1. Tea - 10/-
- 2. Coffee / Milk / Boost / Lemon tea / water bottler - 20/-
- 3. Idly / Bonda / poha / upma / plain dosa - 30/-
- 4. sambar idly / onion / masala dosa / wada / poori - 40/-
- 5. sambar wada / paneer dosa / veg biryani - 50/-
- 6. Bill
- 7. Cancel
- 8. Close

Select the item []
Enter Quantity

```
#include<stdio.h>
```

```
#include<conio.h>
```

```
void main()
```

```
{
```

```
int qty, op,amt=0;
```

```
xyz:
```

```
clrscr();
```

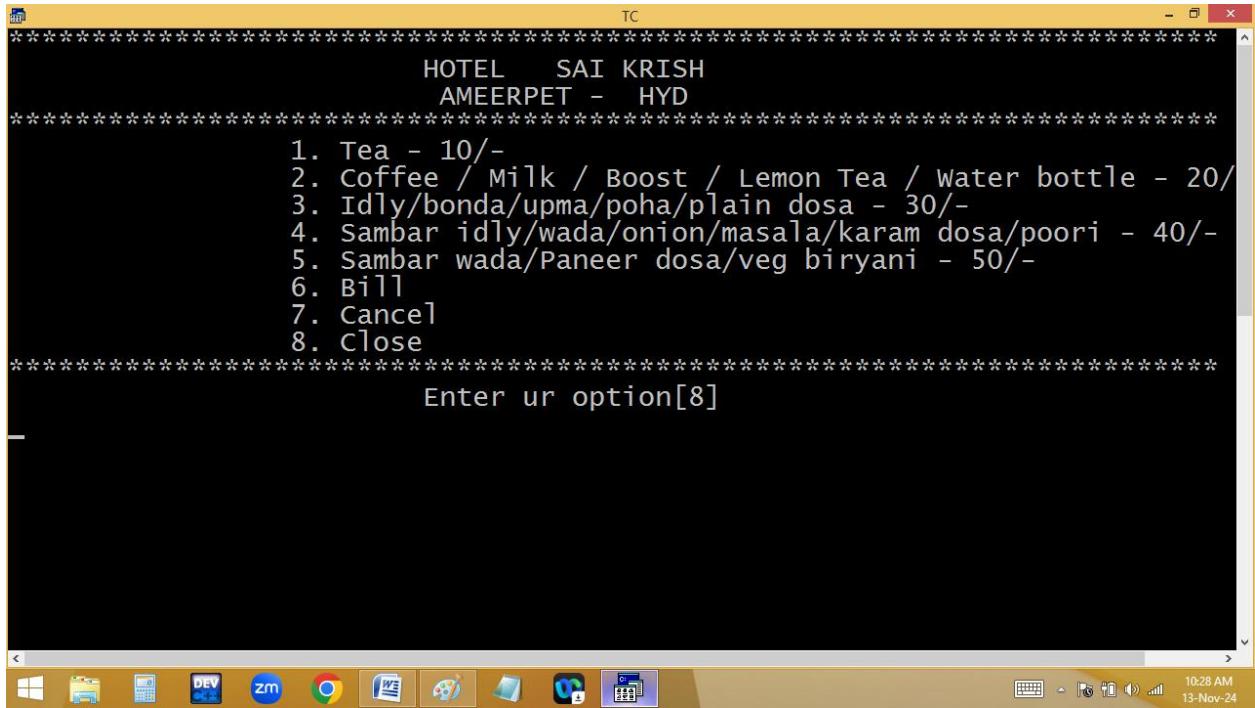
```
puts("*****  
*****");
```

```
puts("\t\t\t HOTEL SAI KRISH ");
```

```
puts("\t\t\t AMEERPET - HYD ");
```

```
puts("*****\n*****");
puts("\t\t 1. Tea - 10/-");
puts("\t\t 2. Coffee / Milk / Boost / Lemon Tea / Water
bottle - 20/-");
puts("\t\t 3. Idly/bonda/upma/poha/plain dosa - 30/-");
puts("\t\t 4. Sambar idly/wada/onion/masala/karam
dosa/poori - 40/-");
puts("\t\t 5. Sambar wada/Paneer dosa/veg biryani - 50/-");
puts("\t\t 6. Bill");
puts("\t\t 7. Cancel");
puts("\t\t 8. Close");
puts("*****\n*****");
printf("\t\t\t Enter ur option[ ]\b\b");
scanf("%d",&op);
if(op>=1 && op<=5)
```

```
{  
printf("Enter Quantity "); scanf("%d",&qty);  
}  
  
switch(op)  
{  
case 1: amt+=qty*10; break;  
case 2: amt+=qty*20; break;  
case 3: amt+=qty*30; break;  
case 4: amt+=qty*40; break;  
case 5: amt+=qty*50; break;  
case 6: printf("Ur bill is %d",amt); amt=0;getch();break;  
case 7: printf("Ur bill cancelled",amt=0);getch(); break;  
case 8: return;  
}  
  
goto xyz;  
}
```



HOTEL SAI KRISH
AMEERPET - HYD

1. Tea - 10/-
2. Coffee / Milk / Boost / Lemon Tea / Water bottle - 20/-
3. Idly/bonda/upma/poha/plain dosa - 30/-
4. Sambar idly/wada/onion/masala/karam dosa/poori - 40/-
5. Sambar wada/Paneer dosa/veg biryani - 50/-
6. Bill
7. Cancel
8. Close

Enter ur option[1]

Enter Quanity 1

```
*****  
HOTEL SAI KRISH  
AMEERPET - HYD  
*****  
1. Tea - 10/-  
2. Coffee / Milk / Boost / Lemon Tea / Water bottle - 20/-  
3. Idly/bonda/upma/poha/plain dosa - 30/-  
4. Sambar idly/wada/onion/masala/karam dosa/poori - 40/-  
5. Sambar wada/Paneer dosa/veg biryani - 50/-  
6. Bill  
7. Cancel  
8. Close  
*****  
Enter ur option[3]  
Enter Quanity 1  
*****
```

```
TC
*****
HOTEL SAI KRISH
AMEERPET - HYD
*****
1. Tea - 10/-
2. Coffee / Milk / Boost / Lemon Tea / Water bottle - 20/-
3. Idly/bonda/upma/poha/plain dosa - 30/-
4. Sambar idly/wada/onion/masala/karam dosa/poori - 40/-
5. Sambar wada/Paneer dosa/veg biryani - 50/-
6. Bill
7. Cancel
8. Close
*****
Enter ur option[6]
Ur bill is 40_
```



```
TC
*****
HOTEL SAI KRISH
AMEERPET - HYD
*****
1. Tea - 10/-
2. Coffee / Milk / Boost / Lemon Tea / Water bottle - 20/-
3. Idly/bonda/upma/poha/plain dosa - 30/-
4. Sambar idly/wada/onion/masala/karam dosa/poori - 40/-
5. Sambar wada/Paneer dosa/veg biryani - 50/-
6. Bill
7. Cancel
8. Close
*****
Enter ur option[2]
Enter Quantity 1_
```

```
TC
*****
HOTEL SAI KRISH
AMEERPET - HYD
*****
1. Tea - 10/-
2. Coffee / Milk / Boost / Lemon Tea / Water bottle - 20/-
3. Idly/bonda/upma/poha/plain dosa - 30/-
4. Sambar idly/wada/onion/masala/karam dosa/poori - 40/-
5. Sambar wada/Paneer dosa/veg biryani - 50/-
6. Bill
7. Cancel
8. Close
*****
Enter ur option[7]
Ur bill cancelled_
```

**Read two numbers and perform arithmetic operations
using a menu.**

Enter two numbers 2 7

M E N U

+ . Add
- . Sub
*. Mul
%. Mod
/ . Div
^ Pow
E . Exit

Enter Ur option[*]

Product = 14

```
#include<stdio.h>
```

```
#include<conio.h>
```

```
#include<stdlib.h>
```

```
#include<math.h>
```

```
void main()
```

```
{
```

```
float a,b;
```

```
char op;
```

```
start:
```

```
clrscr();
```

```
printf("Enter two numbers "); scanf("%f %f",&a, &b);

puts("-----");

puts("\t\t\t M E N U");

puts("-----");

puts("\t\t\t + . Add");

puts("\t\t\t - . Sub");

puts("\t\t\t * . Mul");

puts("\t\t\t % . Mod");

puts("\t\t\t / . Div");

puts("\t\t\t ^ . Pow");

puts("\t\t\t E . Exit");

puts("-----");

flushall();

printf("\t\t\tEnter Ur option[ ]\b\b");scanf("%c",&op);

gotoxy(60,19);

switch(op)

{
```

```
case '+': printf("Sum=%.2f",a+b);break;  
case '-': printf("Sub=%.2f",a-b);break;  
case '*': printf("Mul=%.2f",a*b);break;  
case '%': printf("Mod=%.2f",fmod(a,b));break;  
case '/': printf("Div=%.2f",a/b);break;  
case '^': printf("Pow=%.2f",pow(a,b));break;  
case 'e': case 'E': exit(0);  
default: puts("Invalid option");  
}  
  
getch();  
goto start;  
}
```

```
TC
Enter two numbers 2 5
-----
M E N U
-----
+ . Add
- . Sub
* . Mul
% . Mod
/ . Div
^ . Pow
E . Exit
-----
Enter Ur option[^]
-----
Pow=32.00_
-----
```

The screenshot shows a Windows desktop environment with a terminal window titled "TC". The terminal displays a menu for performing arithmetic operations. The user has entered two numbers, 2 and 5, and selected the power operation (^). The result, 32.00, is displayed at the bottom of the terminal window.

```
TC
Enter two numbers E
-----
M E N U
-----
+ . Add
- . Sub
* . Mul
% . Mod
/ . Div
^ . Pow
E . Exit
-----
Enter Ur option[E]
-----
```

The screenshot shows a Windows desktop environment with a terminal window titled "TC". The terminal displays a menu for performing arithmetic operations. The user has entered the letter 'E' and selected the exit option (E). The terminal window is now empty.

LOOPS / ITERATIONS / REPETITIVE STATEMENTS

Loops are used to repeat a block/group of statements continuously until the given condition becomes false.

Loops reduce program size and improves performance.

In loops beginning and ending points are same.

C-Language supports basically 2 types of loops.

- 1. Entry/pre controlled loops.**
- 2. Exit/post controlled loops.**

In entry control loops, condition is tested first and it is true then only statements block is executed.

Under entry control loops we are having

- i. While loop
- ii. For loop

In exit control loop, the statements are executed first and later condition is tested.

Under exit control loop we are having

- i. do while.

While loop:

- while is a keyword.
- In while loop condition is tested first and it is true then only while block statements are executed. After executing while block statements, the program execution automatically shifted/jumped to while condition at the beginning. If it is true then once again the while block statements are repeated. Like this the

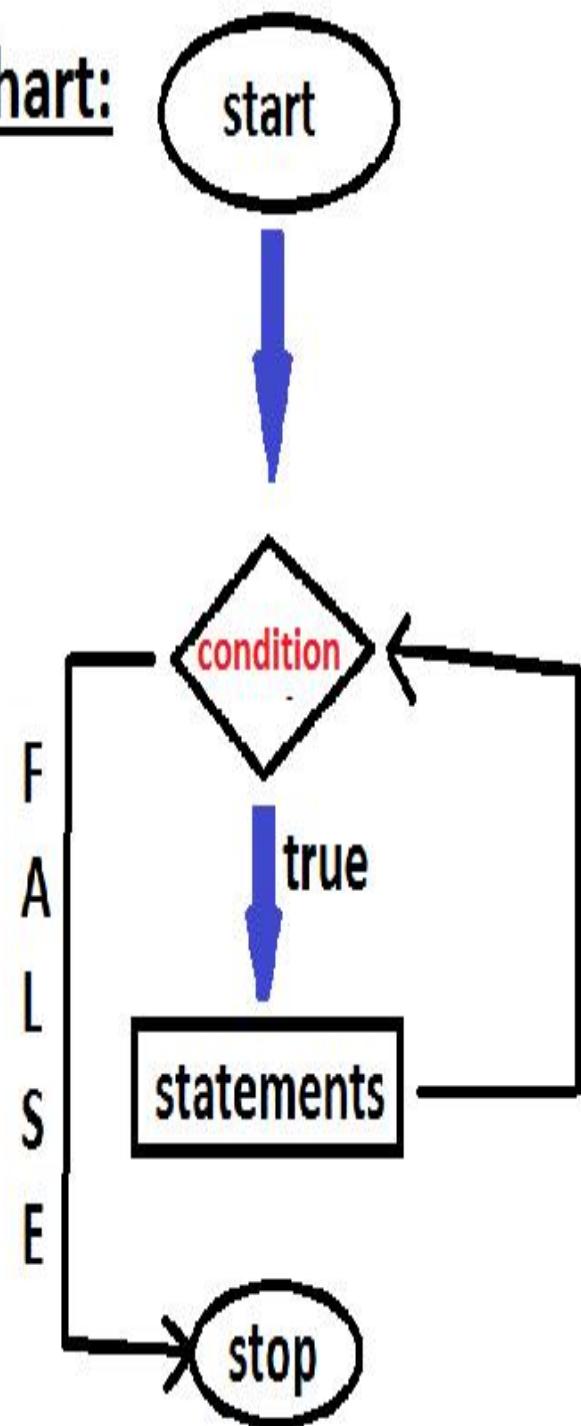
process is continued until while condition becomes false.

- **While is entry control loop.**

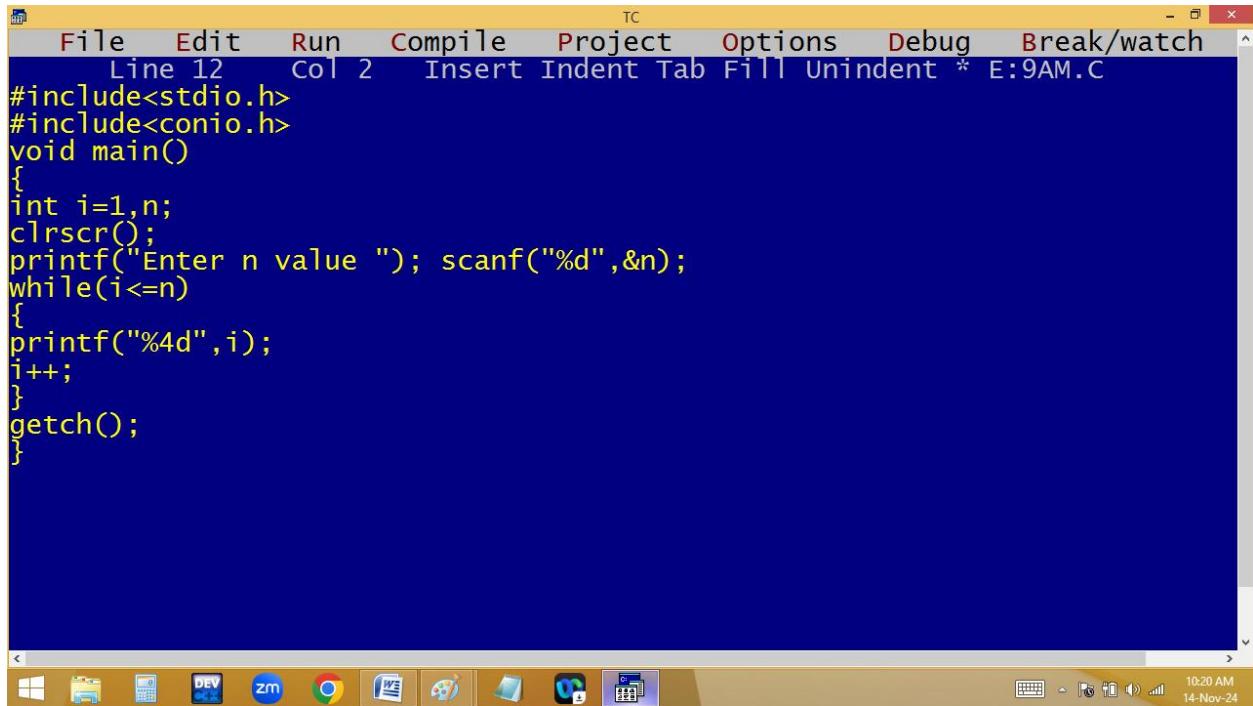
Syntax:

```
-----;  
-----;  
while ( condition )  
F  
a  
l  
s  
e {  
    -----;  
    -----;  
}  
-----;
```

Flow chart:



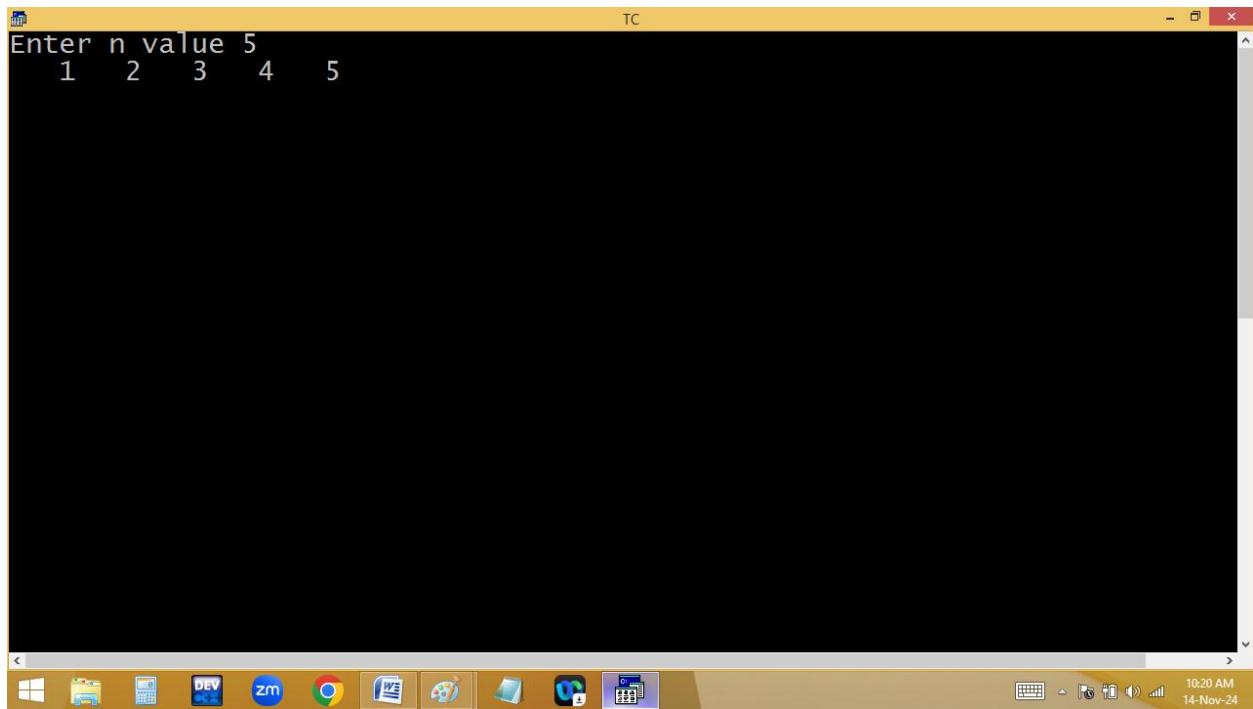
Printing 1..n natural numbers:



A screenshot of a Windows operating system desktop. At the top is the taskbar with various icons. In the center is a terminal window titled "TC" with the following content:

```
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 2 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
printf("%4d",i);
i++;
}
getch();
}
```

The terminal window shows the output of the program's execution.



A screenshot of a Windows operating system desktop. At the top is the taskbar with various icons. In the center is a terminal window titled "TC" with the following content:

```
Enter n value 5
1 2 3 4 5
```

The terminal window shows the output of the program's execution.

TC

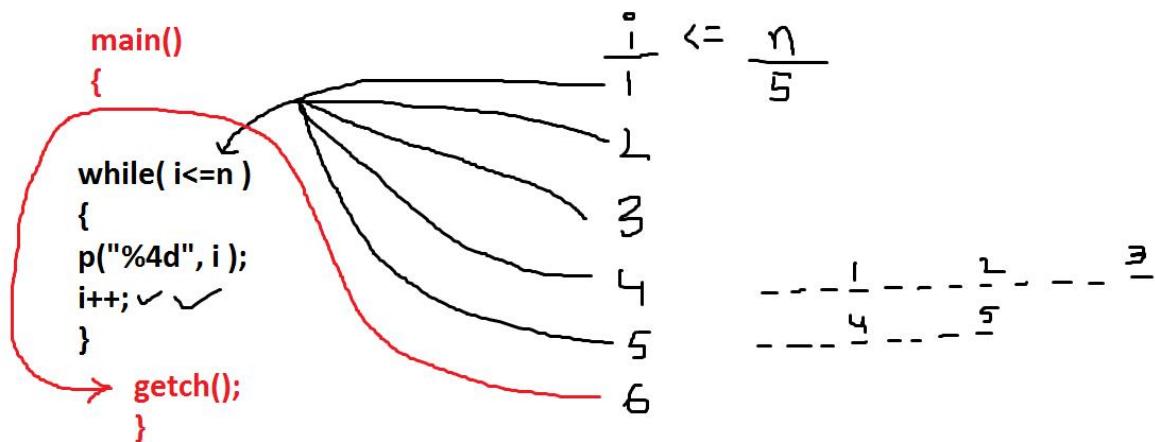
```
Enter n value 100
 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18
21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38
41  42  43  44  45  46  47  48  49  50  51  52  53  54  55  56  57  58
61  62  63  64  65  66  67  68  69  70  71  72  73  74  75  76  77  78
81  82  83  84  85  86  87  88  89  90  91  92  93  94  95  96  97  98
```

TC

```
File Edit Run Compile Project Options Debug Break/watch
Line 8 Col 22 Insert Indent Tab Fill Unindent * E:9AM.C
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)printf("%4d",i++);
getch();
}
```

```
TC
Enter n value 10
 1  2  3  4  5  6  7  8  9  10
```



1..n in reverse order:

N=5 → 5 4 3 2 1

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 top right shows "Line 8 Col 26 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n;
clrscr();
printf("Enter n value ");
scanf("%d",&n);
while(n>=1)printf("%4d",n--);
getch();
}
```

The status bar at the bottom right shows the date and time as "10:27 AM 14-Nov-24".

The screenshot shows a terminal window with the following output:

```
Enter n value 7
7   6   5   4   3   2   1
```

The status bar at the bottom right shows the date and time as "10:27 AM 14-Nov-24".

Print 1 .. n even no's:

A screenshot of a Windows desktop environment. At the top is the taskbar with various icons. Below it is a code editor window titled "TC" (Turbo C) showing C code. The code prints even numbers from 2 to 20. The terminal window below it shows the output of the program.

```
File Edit Run Compile Project Options Debug Break/watch
Line 12 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int i=2,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
printf("%4d",i);
i=i+2;
}
getch();
}
```

A screenshot of a Windows desktop environment. At the top is the taskbar with various icons. Below it is a terminal window titled "TC" (Turbo C) showing the output of the program. The user entered "20" as the value, and the program printed all even numbers from 2 to 20.

```
Enter n value 20
2 4 6 8 10 12 14 16 18 20
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
if(i%2==0)printf("%4d",i);
i++;
}
getch();
}
```

```
Enter n value 25
2 4 6 8 10 12 14 16 18 20 22 24
```

Printing 1..n odd numbers:

TC

File Edit Run Compile Project Options Debug Break/watch

Line 5 Col 8 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
printf("%4d",i);
i=i+2;
}
getch();
}
```

TC

```
Enter n value 30
 1   3   5   7   9   11  13  15  17  19  21  23  25  27  29_
```

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 top indicates Line 11, Col 4, TC, and E:9AM.C. The code in the editor window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
if(i%2!=0)printf("%4d",i);
i++;
}
getch();
}
```

The status bar at the bottom shows the system tray and the date/time: 10:31 AM 14-Nov-24.

The screenshot shows a terminal window with the text "Enter n value 15". Below it, the output shows the numbers 1, 3, 5, 7, 9, 11, 13, and 15, each preceded by a space. The status bar at the bottom shows the system tray and the date/time: 10:31 AM 14-Nov-24.

Finding 1..n numbers sum and avg [mean]:

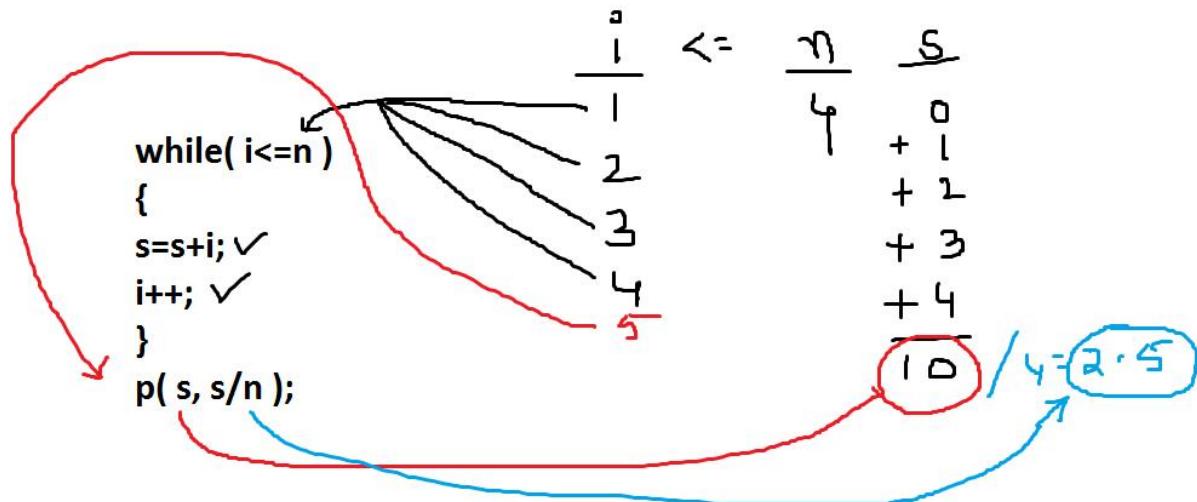
$$n=4 \rightarrow 1 + 2 + 3 + 4 = 10 \leftarrow \text{sum} \rightarrow 10/4=2.5 \leftarrow \text{avg}$$

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i=1,n,s=0;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while(i<=n)
{
s+=i; /* s=s+i; */
i++;
}
printf("Sum=%d, Avg=%.2f",s, (float)s/n); /*explicit type casting*/
getch();
}
```

TC

```
Enter n value 4
Sum=10, Avg=2.50
```

Windows Taskbar: 10:37 AM, 14-Nov-24



Without using loop:

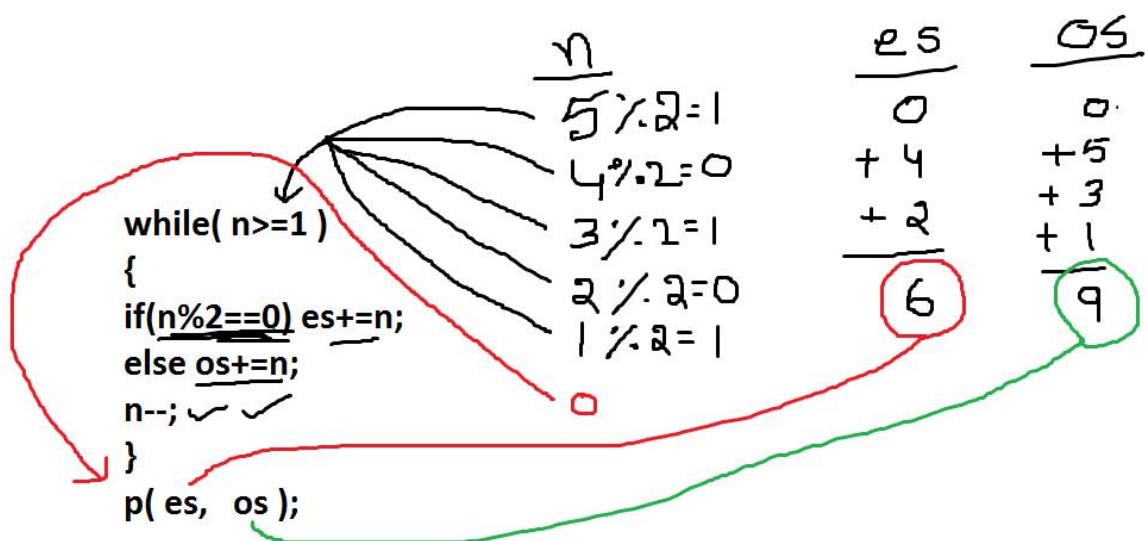
$$4 * 5 = 20 / 2 = 10$$
$$s = n * (n+1) / 2 ;$$

Find 1..n even , odd numbers sum:

$$n = 5$$
$$1 + 3 + 5 = 9$$
$$2 + 4 = 6$$

```
File Edit Run Compile Project Options Debug Break/watch
Line 15 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n,es=0,os=0;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while( n>=1 )
{
if(n%2==0)es+=n;
else os+=n;
n--;
}
printf("Even Sum=%d, Odd Sum=%d",es,os);
getch();
}
```

```
TC
Enter n value 5
Even Sum=6, Odd Sum=9
```



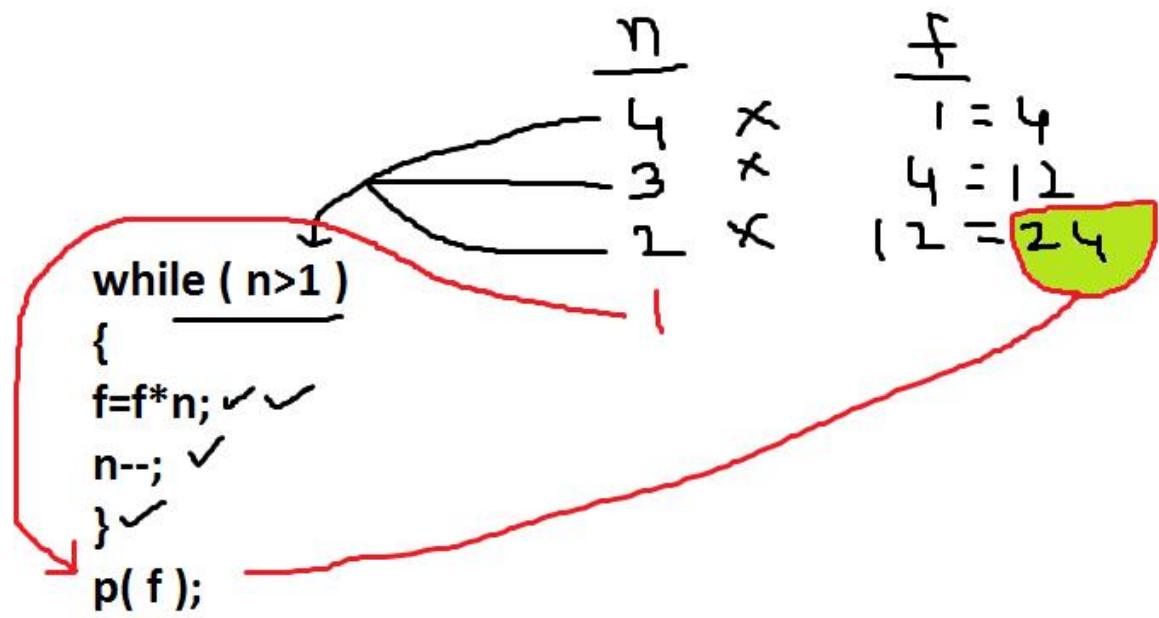
Finding factorial of given no:

The screenshot shows a Windows desktop environment. At the top, there is a taskbar with various icons including DEV, zm, Google Chrome, File Explorer, and others. The main window is a terminal or command-line interface with a dark blue background. The title bar of the window says "TC". The menu bar at the top includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", and "Break/watch". Below the menu, status information is displayed: "Line 13 Col 21 Insert Indent Tab Fill Unindent * E:9AM.C". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n; long f=1;
clrscr();
printf("Enter n value "); scanf("%d",&n);
while( n>1 )
{
f=f*n;
n--;
}
printf("Factorial=%ld",f);
getch();
}
```

When the program is run, it prompts the user to enter a value for n. The user enters "8". The program calculates the factorial of 8, which is 40320, and displays it on the screen.

```
TC
Enter n value 4
Factorial=24
```



Finding power value using user defined program:

$$2^5 = 32$$

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program that calculates the power of a base number. The bottom window shows the execution of the program, where the user inputs 2 and 5, and the output is Power=32.

TC

File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 21 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long r=1;
clrscr();
printf("Enter base, power values "); scanf("%d%d",&b,&p);
while( p>=1 )
{
r=r*b;
p--;
}
printf("Power=%ld",r);
getch();
}
```

Enter base, power values 2 5
Power=32

```
Enter base, power values 100 3  
Power=1000000_
```

```
Enter base, power values 2 3  
Power=8_
```

TC

```
Enter base, power values 2 -3
Power=1
```

File Edit Run Compile Project Options Debug Break/watch

Line 14 Col 64 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long r=1, n;
clrscr();
printf("Enter base, power values "); scanf("%d%d",&b,&p);
if(p<0) {n=p; p=-p;}
while( p>=1 )
{
r=r*b;
p--;
}
if(n>=0) printf("Power=%ld",r);else printf("Power=%.3f",1.0/r);
getch();
}
```

9:37 AM 15-Nov-24

9:43 AM 15-Nov-24

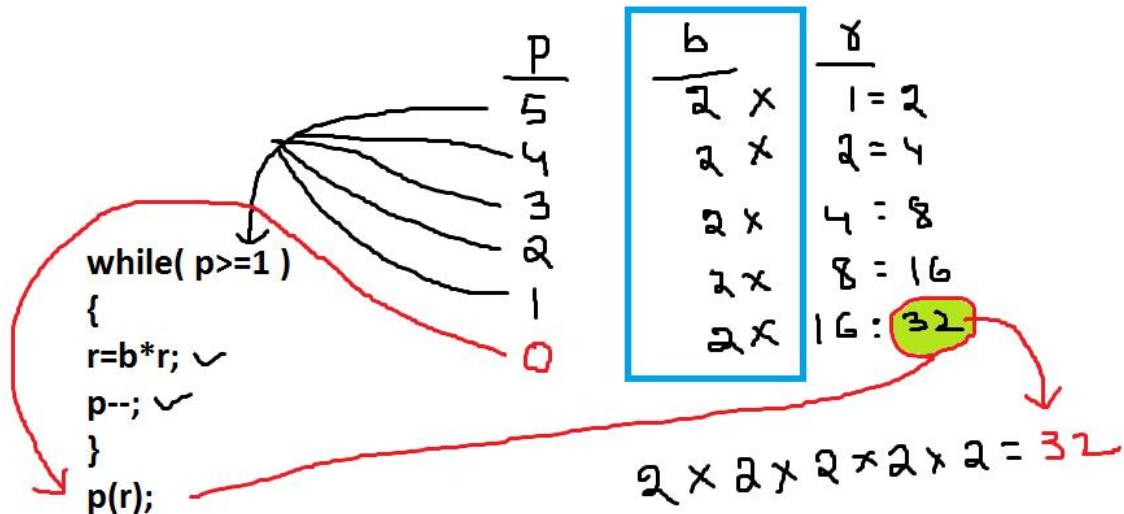
```
Enter base, power values 2 3
Power=8
```



TC

```
Enter base, power values 2 -3
Power=0.125
```

9:43 AM
15-Nov-24



Find the powers sum:

$$2^3 = 2^1 + 2^2 + 2^3 = 2 + 4 + 8 = 14$$

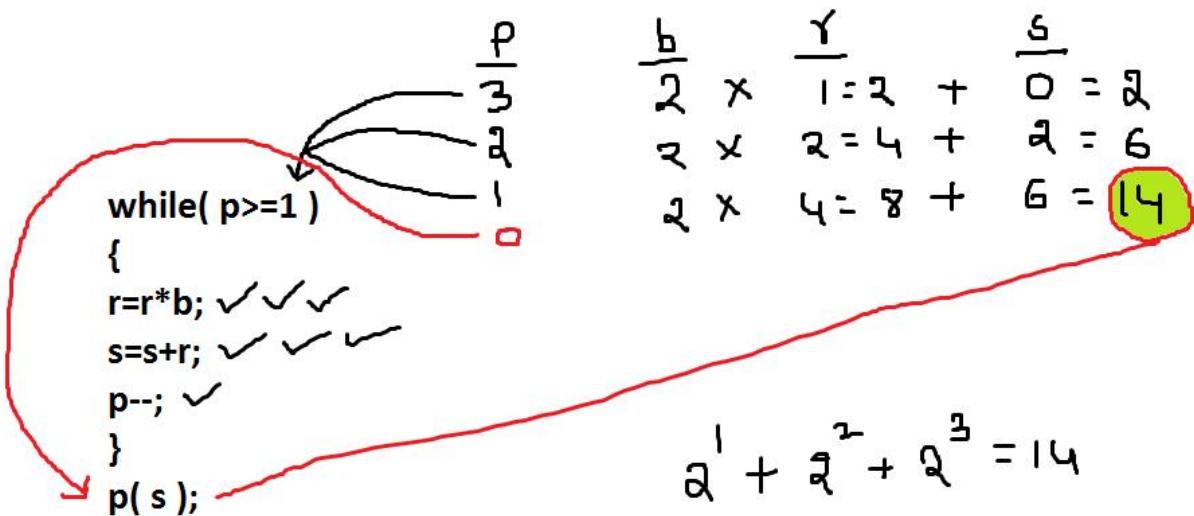
The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ integrated development environment (IDE). The top window displays the source code for a C program that calculates the sum of powers of a base number. The bottom window shows the execution of the program, where the user inputs 2 and 3, and the output is the sum of powers, which is 14.

TC

File Edit Run Compile Project Options Debug Break/watch
Line 14 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int b,p; long r=1, s=0;
clrscr();
printf("Enter base, power values "); scanf("%d%d",&b,&p);
while( p>=1 )
{
r=r*b;
s=s+r;
p--;
}
printf("Power sum=%ld",s);
getch();
}
```

Enter base, power values 2 3
Power sum=14



Using pow():

The image shows a Windows desktop environment with two Command Prompt windows open, both titled "TC".

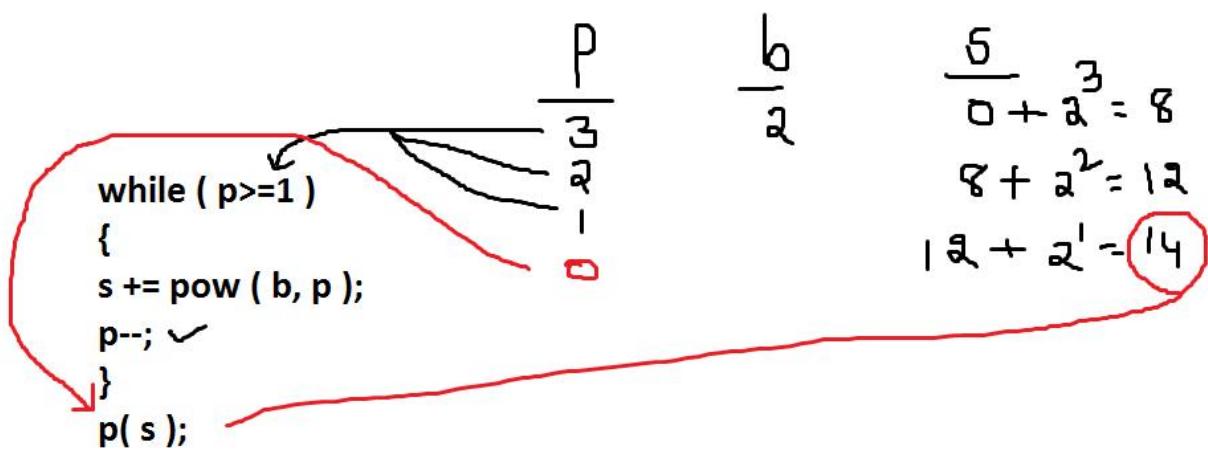
The top window displays the following C code:

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int b,p; long s=0;
clrscr();
printf("Enter base, power values "); scanf("%d%d",&b,&p);
while( p>=1 )
{
s+=pow(b,p);
p--;
}
printf("Power sum=%ld",s);
getch();
}
```

The bottom window shows the output of the program:

```
Enter base, power values 2 3
Power sum=14
```

The taskbar at the bottom of the screen contains several icons, including DEV, zm, Google Chrome, FileZilla, and others. The system tray shows the date and time as 9:53 AM 15-Nov-24.



Finding gcd /hcf of given two numbers:

Greatest common divisor / highest common factor

4 factors are 1, 2, 4

6 factors are 1, 2, 3, 6

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program to calculate the Greatest Common Divisor (GCD) of two numbers. The bottom window shows the execution of the program, where the user inputs 4 and 6, and the output is gcd=2.

TC

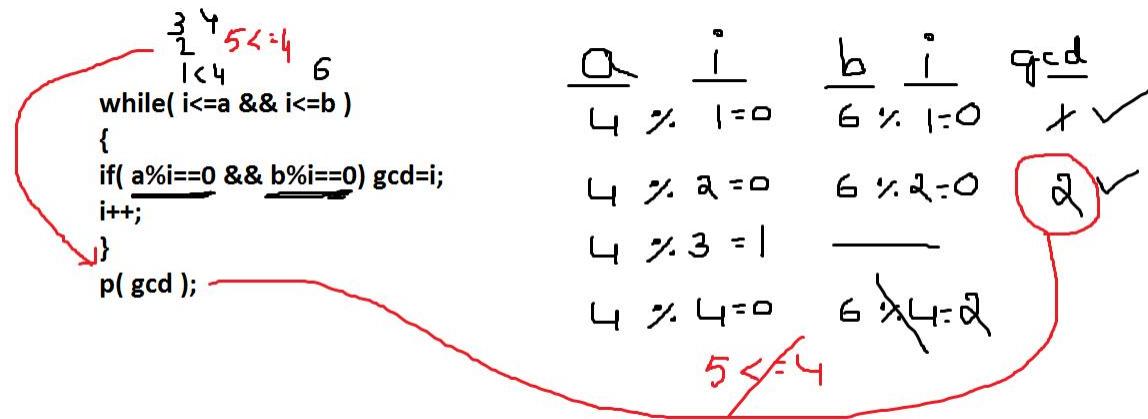
File Edit Run Compile Project Options Debug Break/watch

Line 3 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,i=1,gcd;
clrscr();
printf("Enter two numbers "); scanf("%d%d",&a,&b);
while( i<=a && i<=b )
{
if(a%i==0 && b%i==0) gcd=i;
i++;
}
printf("gcd=%d",gcd);
getch();
}
```

Enter two numbers 4 6
gcd=2_

```
TC
Enter two numbers 10 15
gcd=5
```



Finding lcm of given two numbers: [least common multiple]

Using gcd:

$$a * b / \text{gcd} = \text{lcm}$$

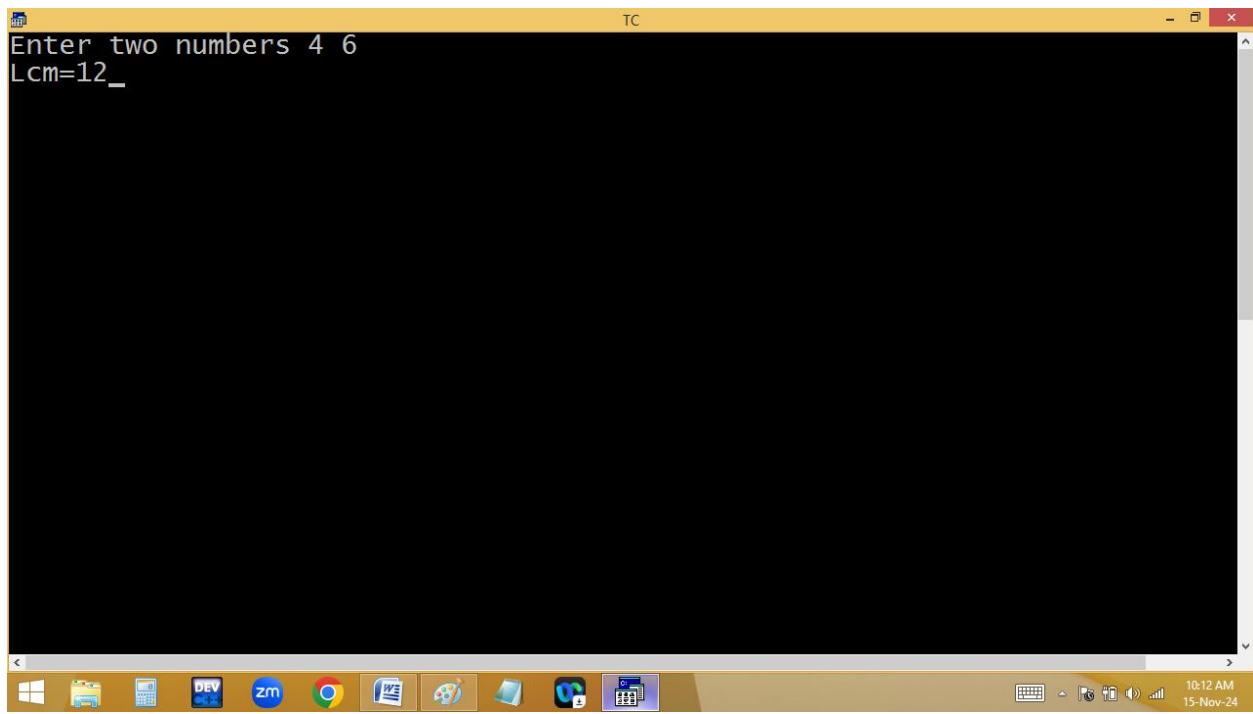
$$4 * 6 = 24 / 2 = 12$$

$$5*3=15/1=15$$

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program that calculates the Least Common Multiple (LCM) of two numbers. The bottom window shows the execution of the program, where the user inputs 3 and 5, and the output is Lcm=15.

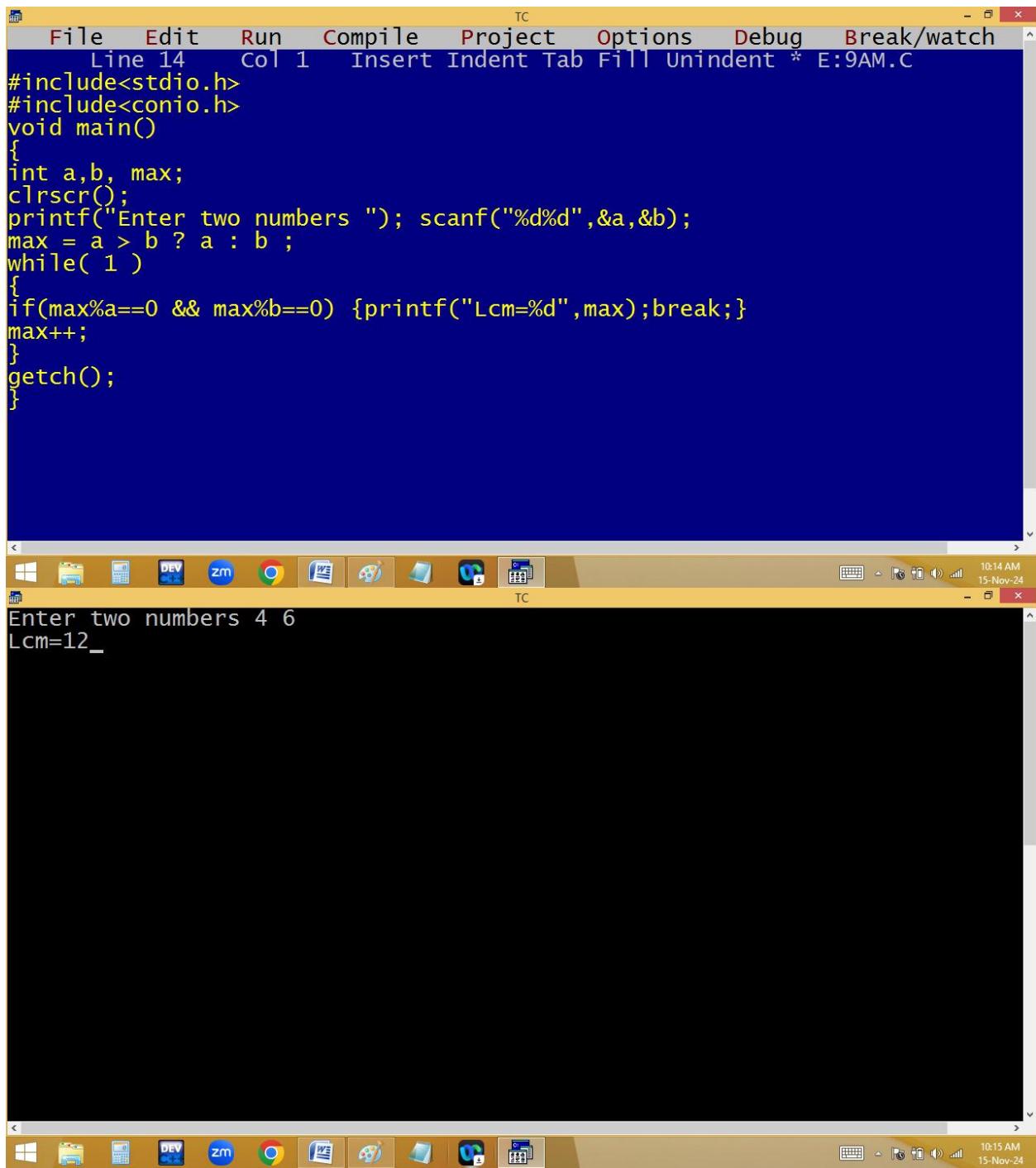
```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,i=1,gcd;
clrscr();
printf("Enter two numbers "); scanf("%d%d",&a,&b);
while( i<=a && i<=b )
{
if(a%i==0 && b%i==0) gcd=i;
i++;
}
printf("Lcm=%d",a*b/gcd);
getch();
}
```

Enter two numbers 3 5
Lcm=15



```
TC
Enter two numbers 4 6
Lcm=12_
```

Method 2 [without using gcd]:



```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b, max;
clrscr();
printf("Enter two numbers "); scanf("%d%d",&a,&b);
max = a > b ? a : b ;
while( 1 )
{
if(max%a==0 && max%b==0) {printf("Lcm=%d",max);break;}
max++;
}
getch();
}
```

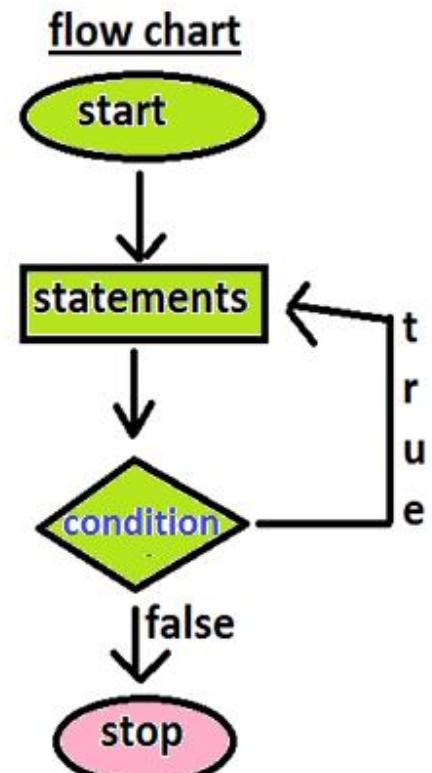
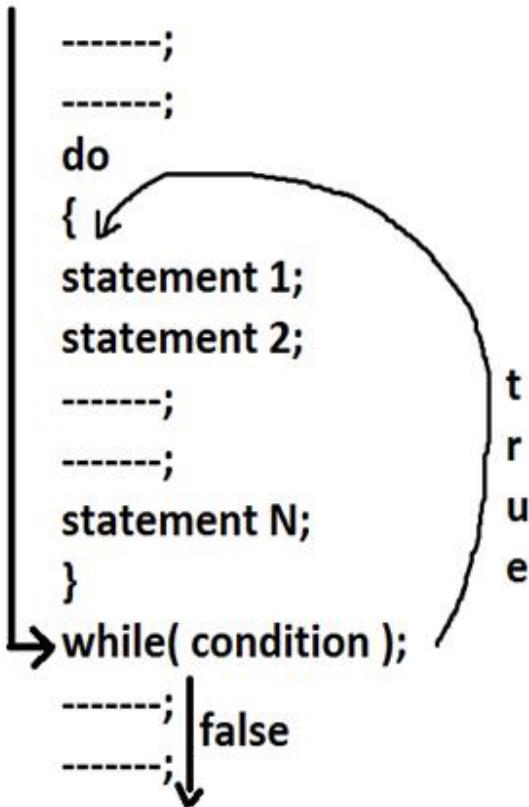
Enter two numbers 4 6
Lcm=12

$$\begin{array}{ll}
 \frac{\max}{6} \frac{a}{4} = 2 & \frac{\max}{6} \frac{b}{6} \\
 7 \% 4 = 3 & \\
 8 \% 4 = 0 & 9 \% 6 = 3 \\
 10 \% 4 = 2 & \\
 11 \% 4 = 3 & \\
 12 \% 4 = 0 & 13 \% 6 = 0
 \end{array}$$


do .. while:

- It is an exit control loop. i.e. in a do while the condition is tested at last.
- Here do , while are the keywords.
- It is also used to repeat a program several times based on a condition.

- In a do while, do block statements are executed first and later while condition is tested. If the while condition is true then once again the do block statements are repeated. Like this the process is continued until the while condition becomes false.
- In do while, the while should be end with semicolon (;).
- Regardless of while condition, the do statements are executed at least one time. Due to this sometimes we are getting unwanted results [garbage values].
- Use do while whenever it is compulsory because of in do while the program is controlled at the bottom / last.



Find the no of digits in given no using a loop:

Eg: 2075 → 4

digits

The image shows a Windows desktop environment with two Command Prompt windows open. The top window is titled 'TC' and contains a C program. The bottom window is also a Command Prompt and shows the output of the program's execution.

Top Window (TC):

```
File Edit Run Compile Project Options Debug Break/watch
Line 13 Col 25 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int d=0;
clrscr();
printf("Enter a number "); scanf("%ld",&n);
while( n!=0 )
{
d++;
n=n/10;
}
printf("%d digit no",d);
getch();
}
```

Bottom Window:

```
Enter a number 2024
4 digit no
```

The taskbar at the bottom of the screen shows various pinned icons, including DEV, zm, Google Chrome, FileZilla, and others. The system tray indicates the date as 15-Nov-24 and the time as 10:21 AM.

```
TC
Enter a number 1234567890
10 digit no_
```

```
TC
Enter a number 9
1 digit no_
```

```
TC
Enter a number -125
3 digit no_
```

```
TC
Enter a number 0
0 digit no_
```

10:23 AM 15-Nov-24

The image shows a Windows desktop environment with two Command Prompt windows. The top window is titled 'TC' and contains a C program. The bottom window is also titled 'TC' and shows the output of the program's execution.

Top Window (TC):

```
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int d=0;
clrscr();
printf("Enter a number "); scanf("%ld",&n);
do
{
d++;
n=n/10;
}
while(n!=0);
printf("%d digit no",d);
getch();
}
```

Bottom Window (TC):

```
Enter a number 0
1 digit no
```

The taskbar at the bottom of the screen shows various application icons, including DEV, zm, Google Chrome, and others. The system tray indicates the date as 15-Nov-24 and the time as 10:24 AM.

```
Enter a number 123  
3 digit no
```

```
Enter a number -123  
3 digit no
```

Without loop/ goto label:

```
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int d;
clrscr();
printf("Enter a number "); scanf("%ld",&n);
d = printf("%ld",n);
if(n<0) d--;
printf(" is a %d digits no", d);
getch();
}
```

```
Enter a number -125
-125 is a 3 digits no
```

```
TC
Enter a number 0
0 is a 1 digits no_
```



```
TC
Enter a number 001
1 is a 1 digits no
```



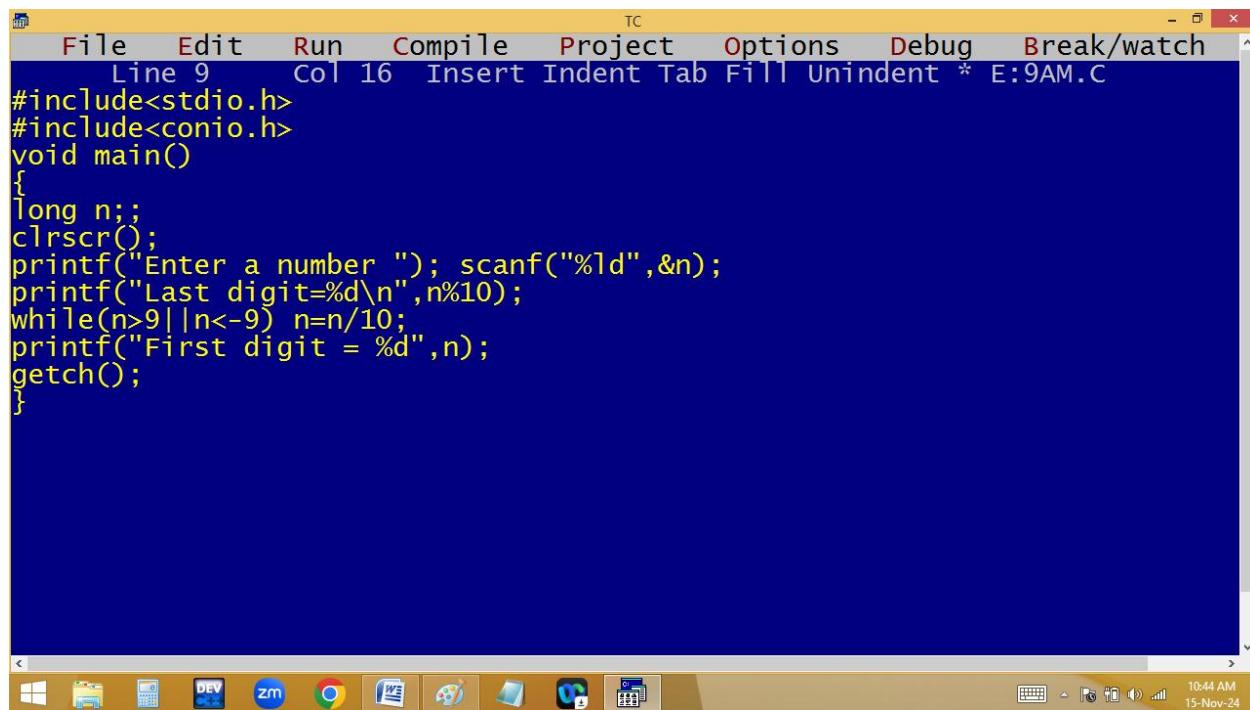
$$\begin{array}{r}
 \overline{n} \\
 - 125 \\
 \hline
 3
 \end{array}$$

$c = \text{printf}("%ld", n);$

p(" is a %d digits no",c);

Finding first and last digits of given no:

Eg: 2017 → 7 is last digit and 2 is first digit.



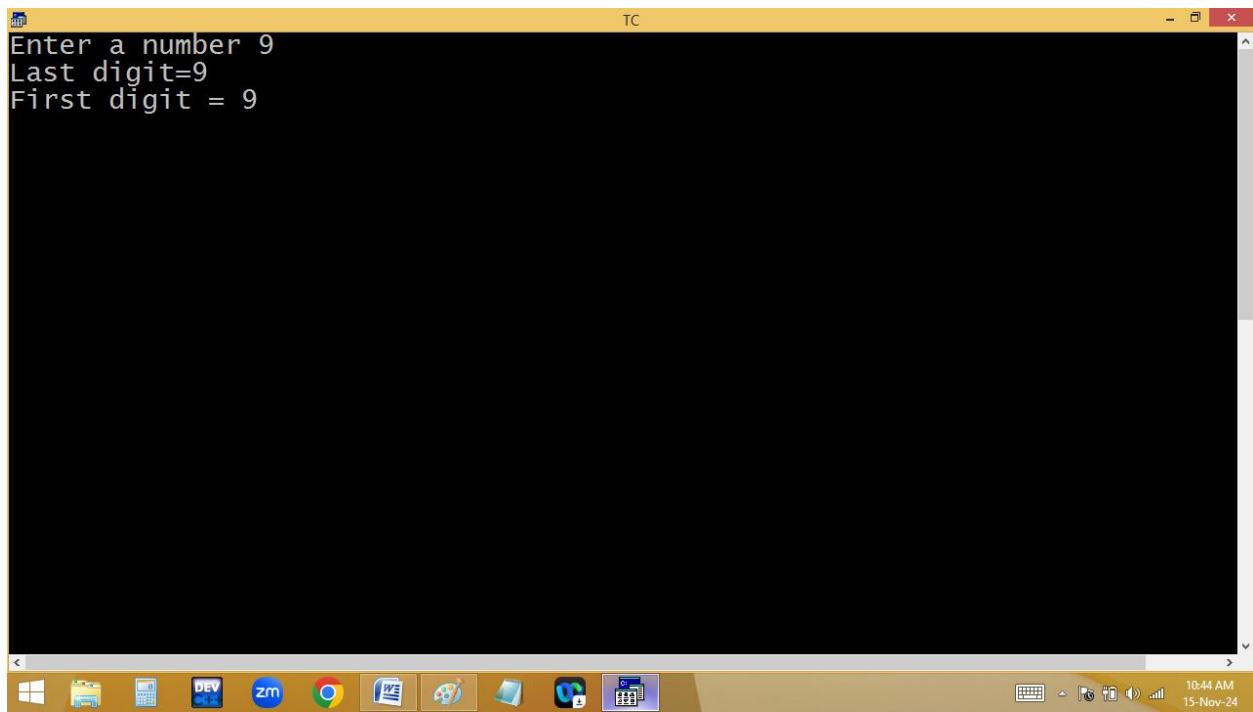
```

File Edit Run Compile Project Options Debug Break/watch
Line 9 Col 16 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
long n;;
clrscr();
printf("Enter a number "); scanf("%ld",&n);
printf("Last digit=%d\n",n%10);
while(n>9||n<-9) n=n/10;
printf("First digit = %d",n);
getch();
}

```

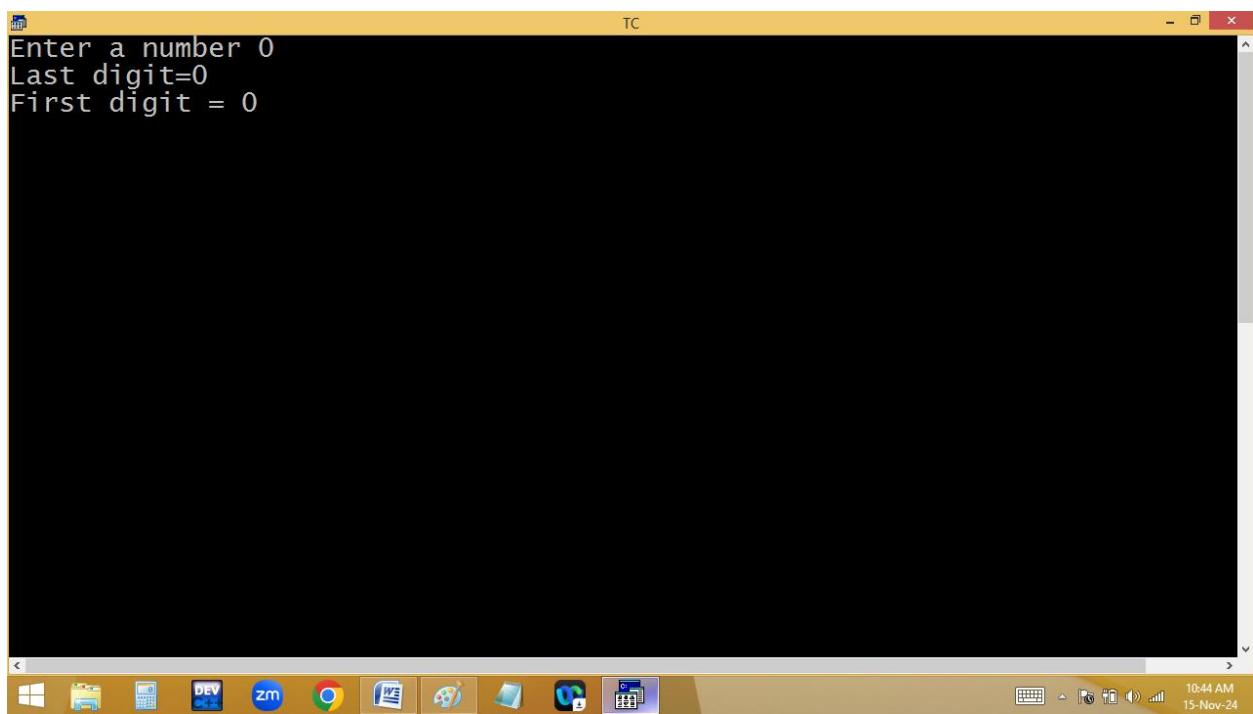
```
TC
Enter a number -123
Last digit=-3
First digit = -1_
```

```
TC
Enter a number 2913
Last digit=3
First digit = 2_
```



```
TC
Enter a number 9
Last digit=9
First digit = 9
```

The screenshot shows a Windows desktop environment. At the top is a window titled "TC" with a black background. Inside the window, the text "Enter a number 9", "Last digit=9", and "First digit = 9" is displayed in white. Below this window is the Windows taskbar, which contains icons for File Explorer, Task View, Start, Taskbar settings, and several pinned applications: DEV, zm, Google Chrome, Microsoft Word, Microsoft Paint, Microsoft Edge, and Microsoft WordPad. On the right side of the taskbar, the date and time are shown as "10:44 AM 15-Nov-24".



```
TC
Enter a number 0
Last digit=0
First digit = 0
```

This screenshot is identical to the one above it, showing the same "TC" window with a black background and white text output: "Enter a number 0", "Last digit=0", and "First digit = 0". It is positioned above the same Windows taskbar with the same set of pinned application icons and system status information.

Home work:

Finding max, min digits of given no.

2715 → 7 max, 1 min

100 → 001

Printf("100 reverse is 001");

102 → One Zero Two

Finding max and min digits of given no:

The screenshot shows a Windows desktop environment with the Turbo C++ IDE open. The IDE window has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and a separator line followed by Edit. The status bar at the bottom of the IDE window displays "Line 15 Col 35 Insert Indent Tab Fill Unindent * E:9AM.C". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n;int r, max=-9, min=9;
    clrscr();
    printf("Enter a number "); scanf("%ld",&n);
    do
    {
        r=n%10;
        if(max<r) max=r;
        if(min>r) min=r;
        n=n/10;
    }while(n!=0);
    printf("Max=%d, Min=%d",max, min);
    getch();
}
```

The terminal window below the editor shows the output of the program. It prompts the user to enter a number, receives "1094", and then prints "Max=9, Min=0". The system tray at the bottom of the screen shows various icons and the date/time "9:34 AM 16-Nov-24".

```
TC
Enter a number 5
Max=5, Min=5
```

```
TC
Enter a number 0
Max=0, Min=0
```

```

TC
Enter a number -1234
Max=-1, Min=-4

```

	n	r	max	min
	1094 % 10 = 4		-9 < 4	9 > 4
do	1094 % 10 = 9		4 < 9	4 > 9
{	109 % 10 = 9		9 < 9	9 > 0
r = n%10;	109 % 10 = 1		9 < 1	9 > 1
if(max<r) max=r;	10 % 10 = 0		1 > 0	1 > 0
if(min>r) min=r;	0			
n=n/10;				
}				
while(n!=0);				
p(max, min);				

Finding reverse no:

123 reverse is 321

$$\begin{array}{r} 1 \ 2 \ 9 \\ \times 1 0 \\ \hline 1 \ 2 \ 9 \end{array}$$

1 2 9
→ $9 \times 10 = 90$
→ + 2
 $\hline 9 \times 10 = 90$
→ + 1
 $\hline 921$

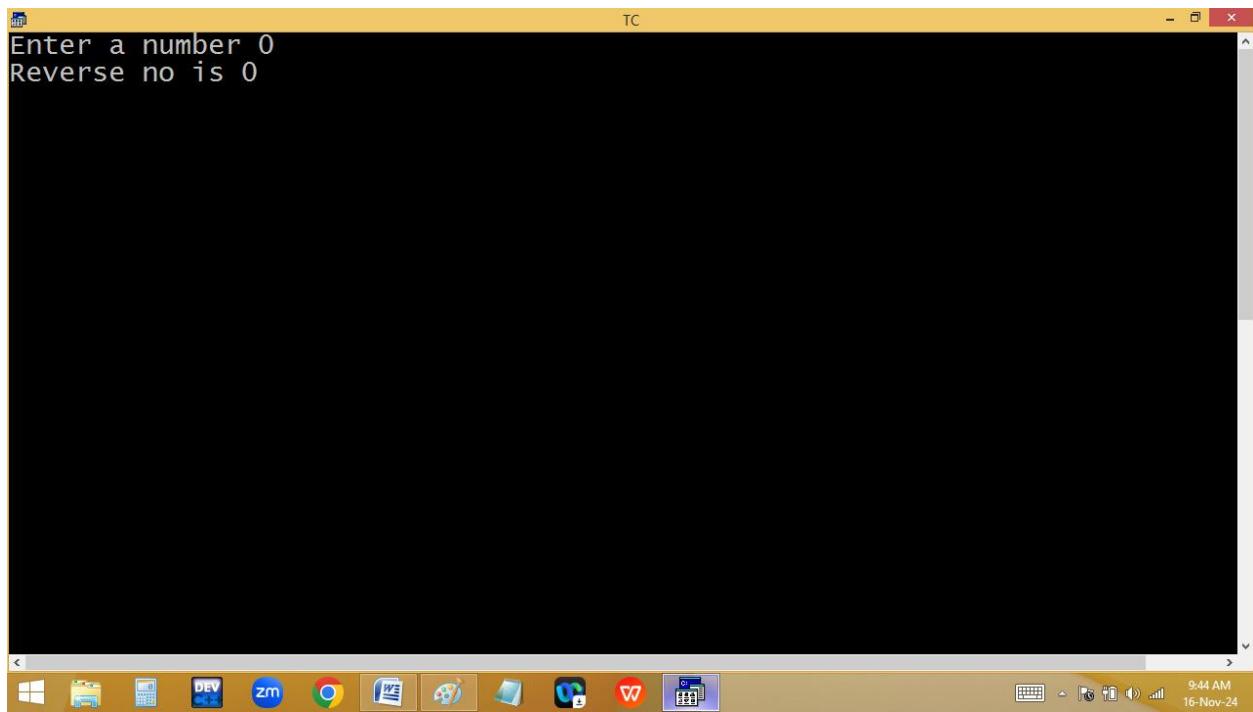
The image shows a screenshot of a Windows desktop environment. At the top, there is a taskbar with various icons including a calculator, a browser, and a file explorer. The main focus is a terminal window titled "TC" which is running a C program. The terminal window has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and TC. Below the menu bar, it displays "Line 15 Col 1 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n, rev=0;int r;
    clrscr();
    printf("Enter a number "); scanf("%ld",&n);
    while(n!=0)
    {
        r=n%10;
        rev=rev*10+r;
        n=n/10;
    }
    printf("Reverse no is %ld",rev);
    getch();
}
```

Below the code, the terminal window shows the output: "Enter a number 123" followed by "Reverse no is 321". The system tray at the bottom right shows the date and time as "9:43 AM 16-Nov-24".

```
TC
Enter a number 10203456
Reverse no is 65430201_
```

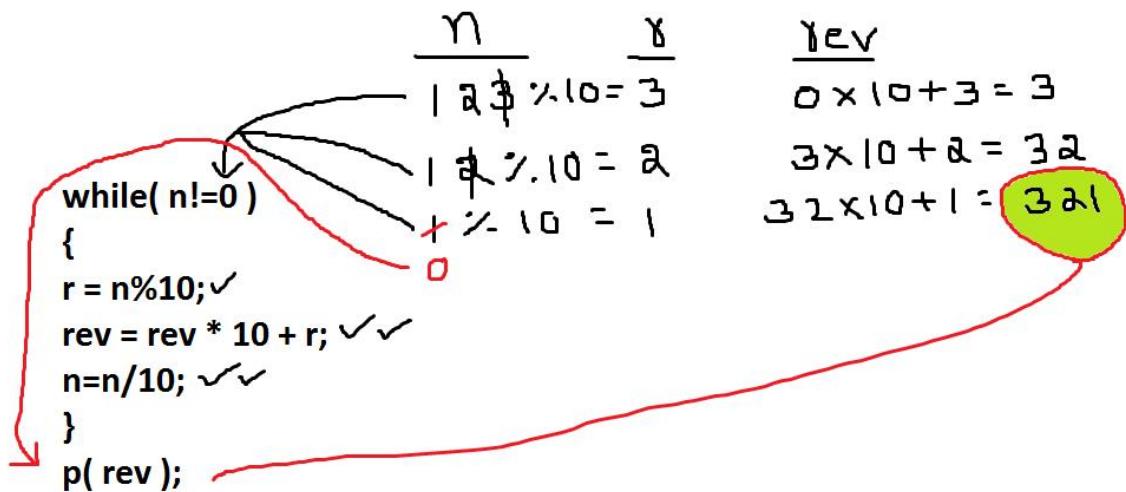
```
TC
Enter a number -123
Reverse no is -321_
```



TC

```
Enter a number 100
Reverse no is 1
```

Windows taskbar: 9:44 AM, 16-Nov-24



$$\frac{n}{100} \times 10 = \square \quad \text{true}$$
$$10 \times 10 = \square \quad \square = 100$$
$$1 \times 10 = 1 \quad \square \times 10 + 1 = 1 \checkmark$$

The image shows a Windows desktop environment with two windows open. The top window is a Turbo C++ IDE (version 2.0) showing a C program to reverse digits of a number. The bottom window is a terminal window displaying the execution of the program.

Turbo C++ IDE Window:

- Menu Bar:** File, Edit, Run, Compile, Project, Options, Debug, Break/watch, Edit
- Status Bar:** Line 8 Col 51 Insert Indent Tab Fill Unindent * E:9AM.C
- Code:**

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n;int r;
    clrscr();
    printf("Enter a number "); scanf("%ld",&n);
    printf("Reverse no is "); if(n<0)printf("-",n=-n);
    do
    {
        r=n%10;
        printf("%d",r);
        n=n/10;
    }while(n!=0);
    getch();
}
```
- Watch:** A section labeled "Watch" is present at the bottom of the code editor.

Terminal Window:

- Output:** Enter a number -123
Reverse no is -321
- System Bar:** Shows icons for various applications like File Explorer, Control Panel, and Task View. The date and time are 9:51 AM 16-Nov-24.

```
Enter a number 1200000
Reverse no is 0000021
```

```
Enter a number 0
Reverse no is 0
```

```
TC
Enter a number 100
Reverse no is 001
```



```
Enter a number -100
Reverse no is -001-
```

$\frac{n}{100} \times 10 = \square$

$\frac{10}{10} \times 10 = \square$

$1 \times 10 = 1$

printf(%)

Finding palindrome no:

121 reverse is 121

The image shows a screenshot of a Windows operating system desktop. At the top, there is a taskbar with various icons, including a Dev-C++ compiler icon. The main window is a terminal or command-line interface window titled "TC". The window title bar includes "File Edit Run Compile Project Options Debug Break/watch TC" and "Edit". The status bar at the bottom of the window displays "Line 14 Col 5 Insert Indent Tab Fill Unindent * E:9AM.C". The terminal window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long m,n,rev=0;int r;
    clrscr();
    printf("Enter a number "); scanf("%ld",&n); m=n;
    while(n!=0)
    {
        r=n%10;
        rev=rev*10+r;
        n=n/10;
    }
    if(m==rev)printf("Palindrome");else printf("Not a Palindrome");
    getch();
}
```

Below the code, the word "Watch" is visible. In the terminal window, the user has entered "121" and the output is "Palindrome_". The desktop background is black, and the taskbar shows other open applications like Google Chrome and Microsoft Word.

```
TC
Enter a number -121
Palindrome
```



```
TC
Enter a number 0
Palindrome
```

$$+ \underline{\text{m}} = \underline{\text{n}} \text{gt} \quad \gamma$$

121 1 2 10 = 1

$$\frac{6e\vee}{0 \times 10 + 1 = 1}$$

$$17 \% 10 = 2$$

$$1 * 10 + 2 = 12$$

$$1 \% 10 = 1$$

0

$$12 * 10 + 1 = 121$$

No to text conversion:

102 → One Zero Two

```
#include<stdio.h>
```

```
#include<conio.h>
```

```
void main()
{
long m,n,rev=0;int r;
clrscr();
printf("Enter a number "); scanf("%ld",&n);
if(n<0) printf("-");n=-n; m=n;
while(n!=0){r=n%10;rev=rev*10+r;n=n/10;} /* reverse no */
do
{
switch(rev%10)
{
case 0: printf("Zero");break;
case 1: printf("One");break;
case 2: printf("Two");break;
case 3: printf("Three");break;
case 4: printf("Four");break;
case 5: printf("Five");break;
case 6: printf("Six");break;
case 7: printf("Seven");break;
case 8: printf("Eight");break;
}
```

```
case 9: printf("Nine");break;  
}  
  
rev=rev/10;  
  
printf(" ");  
  
}while(rev!=0);  
  
while(m%10==0 && m!=0)printf("Zero ",m=m/10);  
  
getch();  
}
```

```
TC
Enter a number -1230000
-One Two Three Zero Zero Zero _
```

10:23 AM
16-Nov-24

```
Enter a number 102030
One Zero Two Zero Three Zero
```

10:23 AM
16-Nov-24

```
TC
Enter a number 0
Zero _
```

Finding no of even / odd / zero digits in given no:

1023 → 1 even, 2 odd, 1 zero

```
do
{
    switch( rev%10 )
    {
        case 0: p("Zero");b;
        case 1: p("One");b;
        case 2: p("Two");b;
        case 9: p("Nine");
    }
    rev=rev/10;
}while( rev !=0);
```

$$\frac{1}{10} 2$$

$$\begin{array}{r} 102 \\ 2 \end{array} \begin{array}{l} \checkmark \\ \times \end{array} \begin{array}{l} \div 10 = 1 \\ \div 10 = 0 \\ \times \div 10 = 2 \end{array}$$

One
Zero
Two

$$\frac{10}{10} \begin{array}{l} \checkmark \\ \times \end{array} \begin{array}{l} \div 10 = 0 \\ \div 10 = 0 \end{array}$$

One Zero Zero

$$\frac{10}{0}$$

while (m%10==0 && m!=0) p("Zero", m/=10);

The image shows a screenshot of a Windows operating system desktop. At the top, there is a taskbar with various icons. In the center, a terminal window titled "TC" is open, displaying a C program. The code reads a number from the user, counts the number of even, odd, and zero digits, and prints them out. The terminal window also shows the system tray at the bottom.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n; int r, e,o,z;
    clrscr();
    printf("Enter a number "); scanf("%ld",&n);
    e=o=z=0;
    do
    {
        r=n%10;
        if(r==0)z++; else if(r%2==0)e++; else o++;
        n=n/10;
    }while(n!=0);
    printf("Even=%d, Odd=%d, Zero=%d",e,o,z);
    getch();
}
```

Watch

```
Enter a number 1023
Even=1, Odd=2, Zero=1
```

```
TC
Enter a number -1234
Even=2, Odd=2, Zero=0
```



```
TC
Enter a number 100
Even=0, Odd=1, Zero=2
```

```
TC
Enter a number 0
Even=0, Odd=0, Zero=1
```

```

do
{
r=n%10;
if(r==0)z++;
else if(r%2==0)e++;
else o++; ✓
n=n/10; ✓
}while(n!=0);
p( e, o, z );

```

n	r	e	o	z
1023	10=3	0	0	0

$$10 \div 10 = 2$$

$$10 \div 10 = 0$$

$$1 \div 10 = 1$$

✓

1

1

2

for loop:

It is an entry control loop.

for is a keyword.

It is also used to repeat a program several times based on a condition.

When compared with while and do while, for loop is looking to be smart. In for it is compulsory to maintain two semicolons.

For works without condition also and default condition is always 1 i.e. true.

Generally for loop is having 3 expressions.

- 1. Initialization**
- 2. Test condition / expression**
- 3. Increment/decrement / updation**

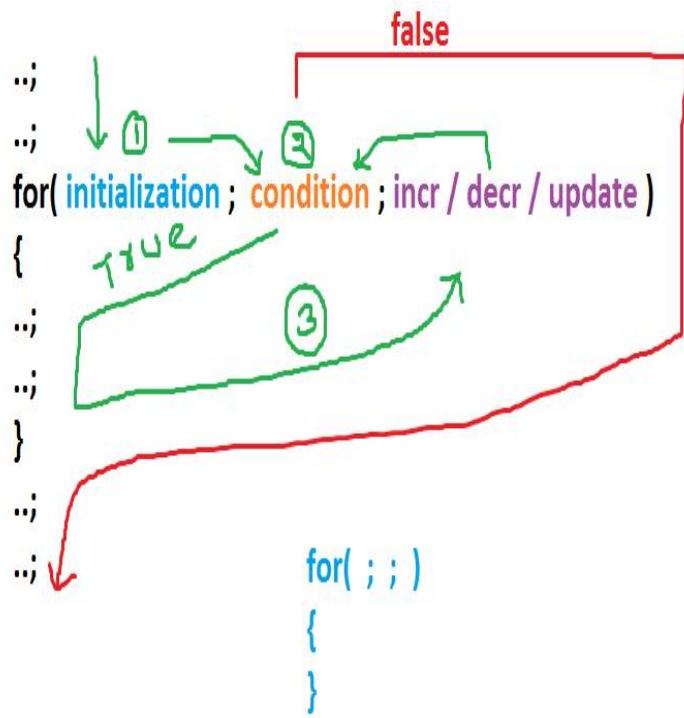
At first entry of for loop the initialization part is executed and later the test condition is checked. If the condition is true then the for block statements are executed. After completion of the block, the increment or decrement part is executed. Later once again the test condition is evaluated. If it is true then

once again for block statements are executed. Like this the process is continued until the condition becomes false. Here the initialization part is executed only once, at the time of loop beginning.

It is mandatory to maintain 2 semicolon (;) in a for loop.

If the for loop is having more than three expressions, it is mandatory to separate the expressions with , separator.

If the for loop is having less than three expressions, then leave the expressions with empty semicolon.



```

for( exp ; exp ; exp )
{
..;
}

```

```

for( exp, exp ; exp ; exp, exp )
{
}

```

```

for( ; exp ; )
{
}

```

Printing the given table:

9th table

$$9*1=9$$

$$9*2=18$$

$$9*3=27$$

..

..

$$9*10=90$$

The image shows a Windows desktop environment with two Command Prompt windows. The top window is titled 'TC' and displays a C program. The bottom window shows the execution of the program.

Top Window (TC):

```
File Edit Run Compile Project Options Debug Break/watch
Line 11 Col 2 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int t,i;
clrscr();
printf("Enter table number "); scanf("%d",&t);
for(i=1;i<=10;i++)
{
printf("%d * %d = %d\n",t,i,t*i);
}
getch();
}
```

Bottom Window:

```
Enter table number 9
9 * 1 = 9
9 * 2 = 18
9 * 3 = 27
9 * 4 = 36
9 * 5 = 45
9 * 6 = 54
9 * 7 = 63
9 * 8 = 72
9 * 9 = 81
9 * 10 = 90
```

The image shows a Windows desktop environment with two windows open. The top window is a terminal window titled 'TC' with a black background. It displays the output of a C program that prints a multiplication table for the number 4000. The output is as follows:

```
Enter table number 4000
4000 * 1 = 4000
4000 * 2 = 8000
4000 * 3 = 12000
4000 * 4 = 16000
4000 * 5 = 20000
4000 * 6 = 24000
4000 * 7 = 28000
4000 * 8 = 32000
4000 * 9 = -29536
4000 * 10 = -25536
```

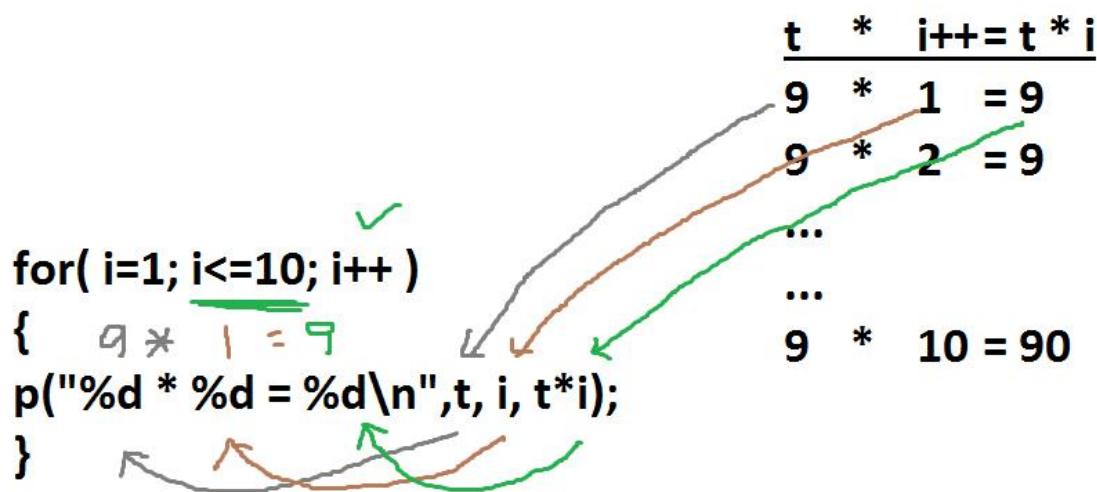
The bottom window is a code editor titled 'TC' with a dark blue background. It shows the C code for the program. The code includes #include directives for stdio.h and conio.h, a main function that prompts the user for a table number, loops through values 1 to 10, and prints the result of each multiplication. It also includes getch() at the end to hold the screen.

```
#include<stdio.h>
#include<conio.h>
void main()
{
long int t; int i;
clrscr();
printf("Enter table number "); scanf("%ld",&t);
for(i=1;i<=10;i++)
{
printf("%ld * %d = %ld\n",t,i,t*i);
}
getch();
}
```

```
Enter table number 4000
4000 * 1 = 4000
4000 * 2 = 8000
4000 * 3 = 12000
4000 * 4 = 16000
4000 * 5 = 20000
4000 * 6 = 24000
4000 * 7 = 28000
4000 * 8 = 32000
4000 * 9 = 36000
4000 * 10 = 40000
```



```
Enter table number 400000
400000 * 1 = 400000
400000 * 2 = 800000
400000 * 3 = 1200000
400000 * 4 = 1600000
400000 * 5 = 2000000
400000 * 6 = 2400000
400000 * 7 = 2800000
400000 * 8 = 3200000
400000 * 9 = 3600000
400000 * 10 = 4000000
```



Print below series:

1 2 3 9 4 5 6 18 7 8 9 27 ... n

The screenshot shows a Windows desktop environment with a terminal window open. The terminal window has a dark blue background and displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i;
clrscr();
printf("Enter the number "); scanf("%d",&n);
for(i=1;i<=10;i++)
{
printf("%4d",i);
if(i%3==0)printf("%4d",i*3);_
}
getch();
```

Below the code, the terminal prompts the user to "Enter the number" and expects input. The user has typed "10" followed by a carriage return. The terminal then outputs the numbers 1 through 10, with each multiple of 3 followed by a value three times greater than the original number. The output is as follows:

```
Enter the number 10
1 2 3 9 4 5 6 18 7 8 9 27 10_
```

```
for( i=1; i<=n; i++)  
{  
printf(i);  
if( i%3==0 ) p( i * 3 );  
}
```

n	i
10	$1 \% 3 = 1$
	$2 \% 3 = 2$
	$3 \% 3 = 0 \implies 3 * 3 = 9$
	4
	5
	$6 \% 3 = 0 \implies 6 * 3 = 18$
	7
	8
	$9 \% 3 = 0 \implies 9 * 3 = 27$
	10

Print below series:

$$n=5 \rightarrow 1-2+3-4+5=3$$

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i,s=0;
clrscr();
printf("Enter the number "); scanf("%d",&n);
for(i=1;i<=n;i++)
{
if(i%2==0)printf("%d+",i,s=s-i);
else printf("%d-",i,s=s+i);
}
printf("\b=\b%d",s);
getch();
}
```

Enter the number 5
1-2+3-4+5=3

```
TC
Enter the number 8
1-2+3-4+5-6+7-8=-4
```



```
Enter the number 2
1-2=-1
```

```
for( i=1; i<=5; i++ )
{
    if( i%2==0 ) printf("%d+",i,s=s-i);
    else printf("%d-",i, s=s+i);
}
printf("%d",s);
```

$$\begin{array}{cccc} \frac{n}{5} & \overset{1}{\cancel{1}} & \overset{5}{\cancel{5}} & \checkmark \\ 1 \% 2 = 1 & 0 + 1 = 1 \\ 2 \% 2 = 0 & 1 - 2 = -1 \\ 3 \% 2 = 1 & -1 + 3 = 2 \\ 4 \% 2 = 0 & 2 - 4 = -2 \\ 5 \% 2 = 1 & -2 + 5 = 3 \\ 6 & & & \end{array}$$

$$1 - 2 + 3 - 4 + 5 - = 3$$

Without using \b:

The image shows a Windows desktop environment with three windows open:

- Top Window (Terminal):** A dark blue terminal window titled "TC". The status bar at the bottom indicates "Line 8 Col 11 Insert Indent Tab Fill Unindent * E:9AM.C". The code inside is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i,s=0;
clrscr();
printf("Enter the number "); scanf("%d",&n);
for(i=1;i<n;i++)
{
if(i%2==0)printf("%d+",i,s=s-i);
else printf("%d-",i,s=s+i);
}
if(i%2==0)printf("%d=%d",i,s-i);
else printf("%d=%d",i,s+i);
getch();
}
```

- Middle Window (File Explorer):** A standard Windows file explorer window showing icons for various files and folders.
- Bottom Window (Taskbar):** The Windows taskbar displaying the Start button, pinned icons for File Explorer, Task View, Control Panel, and others, and system status icons.

The terminal window displays the output of the program:

```
Enter the number 5
1-2+3-4+5=3_
```

The date and time in the taskbar indicate it is 9:57 AM on November 18, 2024.

```
Enter the number 4
1-2+3-4=-2
```

```
for( i=1; i< 5; i++ )
{
    if( i%2==0 ) printf("%d+",i,s=s-i);
    else printf("%d-",i, s=s+i);
}
if(i%2==0) printf("%d=%d",i,s-i);
else printf("%d=%d",i,s+i);
```

$$\begin{array}{r}
 \frac{n}{5} \quad \frac{1}{1 \% 2 = 1} \quad \frac{s}{0 + 1 = 1} \\
 \checkmark \\
 2 \% 2 = 0 \quad 1 - 2 = -1 \\
 3 \% 2 = 1 \quad -1 + 3 = 2 \\
 \underline{4 \% 2 = 0 \quad 2 - 4 = -2} \\
 5 \% 2 = 1 \quad -2 + 5 = 3
 \end{array}$$

$$1 - 2 + 3 - 4 + 5 = 3$$

Print below series:

$$n=5 \rightarrow 1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 1 + 4 + 9 + 16 + 25 = 55$$

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program that calculates the sum of squares of numbers up to a given input. The bottom window shows the execution of the program, prompting for input and displaying the result.

Top Window (Compiler Output):

```
TC
File Edit Run Compile Project Options Debug Break/watch
Line 10 Col 19 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i,s=0;
clrscr();
printf("Enter the number "); scanf("%d",&n);
for(i=1;i<=n;i++)
{
printf("%d%c+",i,253,s=s+i*i);
}
printf("\b=%d",s);
getch();
}
```

Bottom Window (Program Output):

```
Enter the number 5
12+22+32+42+52=55_
```

```
printf("%d%c+", i, 253);
```

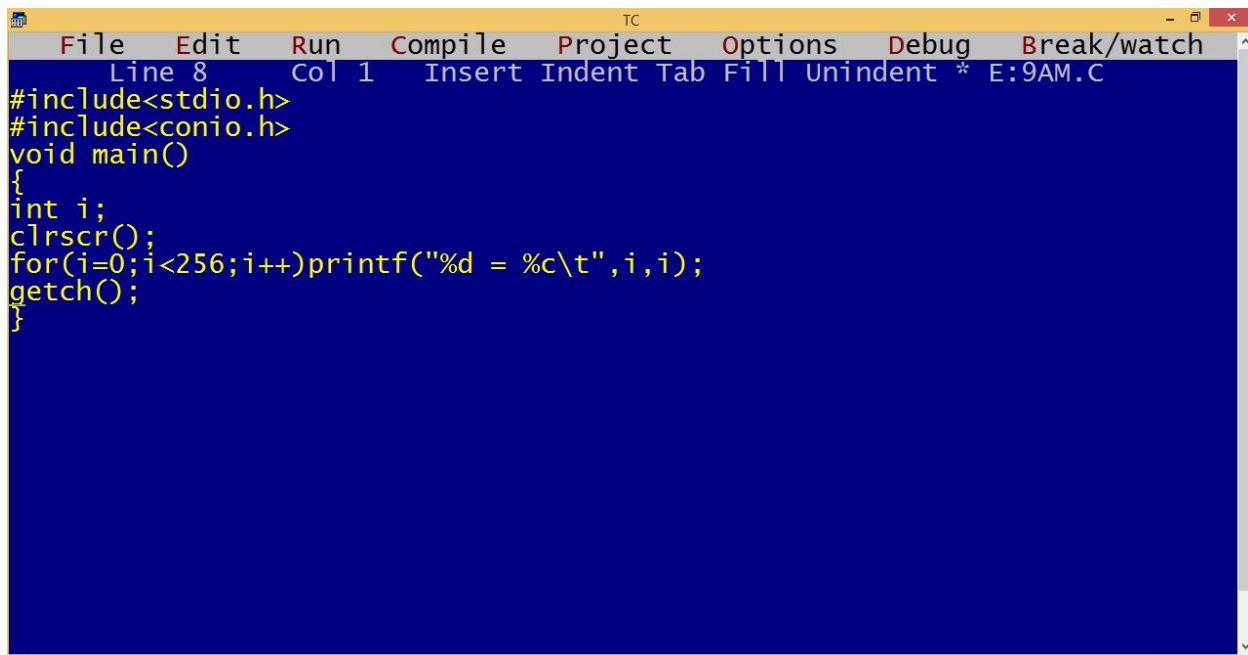
Without using \b:

The image shows a Windows operating system desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window title bar includes the menu bar: File, Edit, Run, Compile, Project, Options, Debug, Break/watch, and status indicators: Line 14, Col 1, Insert, Indent, Tab, Fill, Unindent, * E:9AM.C. The code inside the terminal window is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,i,s=0;
clrscr();
printf("Enter the number "); scanf("%d",&n);
for(i=1;i<=n;i++)
{
s=s+i*i;
if(i<n) printf("%d%c+",i,253);
else printf("%d%c=%d",i,253,s);
}
getch();
}
```

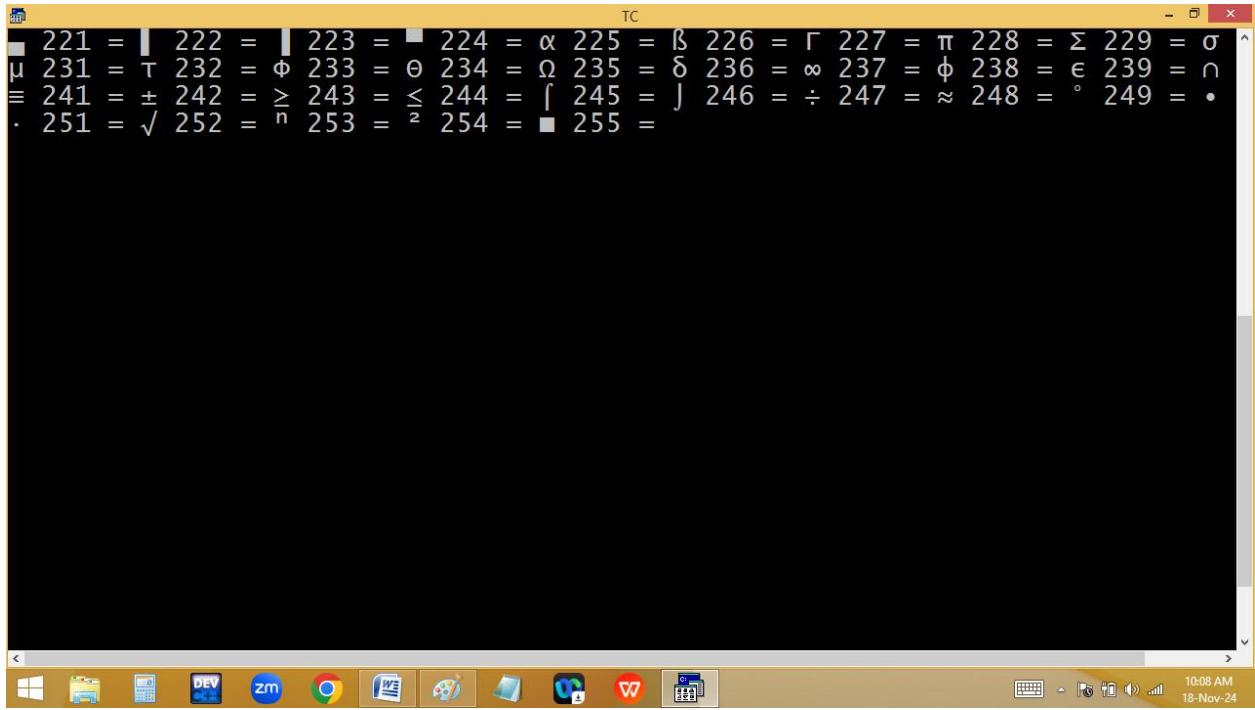
Below the terminal window, the taskbar displays several icons for common applications like File Explorer, Control Panel, and various system utilities. The system tray shows the date and time as 10:05 AM 18-Nov-24.

ASCII Table:



```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=0;i<256;i++)printf("%d = %c\t",i,i);
getch();
}
```

0	=	1	=	⊗	2	=	⊗	3	=	♥	4	=	♦	5	=	♣	6	=	♠	7	=	8	=		
					10	=																			
					14	=	¤	15	=	*	16	=	►	17	=	◀	18	=	↑	19	=	!!	20	=	¶
22	=	-			23	=	↓	24	=	↑	25	=	↓	26	=	↔	27	=	↖	28	=	↙	29	=	↔
31	=	▼			32	=	!	33	=	!	34	=	"	35	=	#	36	=	\$	37	=	%	38	=	&
41	=)			42	=	*	43	=	+	44	=	,	45	=	-	46	=	.	47	=	/	48	=	0
51	=	3			52	=	4	53	=	5	54	=	6	55	=	7	56	=	8	57	=	9	58	=	:
61	=	=			62	=	>	63	=	?	64	=	@	65	=	A	66	=	B	67	=	C	68	=	D
71	=	G			72	=	H	73	=	I	74	=	J	75	=	K	76	=	L	77	=	M	78	=	N
81	=	Q			82	=	R	83	=	S	84	=	T	85	=	U	86	=	V	87	=	W	88	=	X
91	=	[92	=	\	93	=]	94	=	^	95	=	-	96	=	`	97	=	a	98	=	b
101	=	e			102	=	f	103	=	g	104	=	h	105	=	i	106	=	j	107	=	k	108	=	l
111	=	o			112	=	p	113	=	q	114	=	r	115	=	s	116	=	t	117	=	u	118	=	v
121	=	y			122	=	z	123	=	{	124	=		125	=	}	126	=	~	127	=	△	128	=	Ç
é	131	=	â		132	=	ä	133	=	à	134	=	å	135	=	ç	136	=	ê	137	=	ë	138	=	é
î	141	=	ì		142	=	Ä	143	=	Å	144	=	É	145	=	æ	146	=	Æ	147	=	ô	148	=	ö
û	151	=	ù		152	=	ÿ	153	=	Ö	154	=	Ü	155	=	¢	156	=	£	157	=	¥	158	=	Rs
á	161	=	í		162	=	ó	163	=	ú	164	=	ñ	165	=	Ñ	166	=	ª	167	=	º	168	=	¸
¬	171	=	½		172	=	¼	173	=	i	174	=	«	175	=	»	176	=	„	177	=	„	178	=	„
µ	181	=	¶		182	=	¶	183	=	¶	184	=	¶	185	=	¶	186	=	¶	187	=	¶	188	=	¶
¶	191	=	¶		192	=	¶	193	=	¶	194	=	¶	195	=	¶	196	=	¶	197	=	¶	198	=	¶
¶	201	=	¶		202	=	¶	203	=	¶	204	=	¶	205	=	¶	206	=	¶	207	=	¶	208	=	¶
¶	211	=	¶		212	=	¶	213	=	¶	214	=	¶	215	=	¶	216	=	¶	217	=	¶	218	=	¶



Harmonic series:

$$n=5 \rightarrow 1 + 1/1 + 1/2 + 1/3 + 1/4 + 1/5 = 3.28$$

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,n; float s=1;
clrscr();
printf("Enter n value "); scanf("%d",&n);
printf("1+");
for(i=1;i<=n;i++)
{
printf("1/%d+",i,s=s+1.0/i);
}
printf("\b= %.2f",s);
getch();
}
```

Enter n value 5
1+1/1+1/2+1/3+1/4+1/5=3.28

Finding digits sum:

$$n=123 \rightarrow 1 + 2 + 3 = 6$$

The image shows a Windows desktop environment with two Command Prompt windows open, both titled "TC".

The top window displays the source code for a C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n; int_s;
    clrscr();
    printf("Enter n value "); scanf("%ld",&n);
    for(s=0;n!=0;n=n/10)s=s+n%10;
    printf("Digits sum is %d",s);
    getch();
}
```

The bottom window shows the output of the program execution:

```
Enter n value 123
Digits sum is 6
```

The taskbar at the bottom of the screen contains several icons, including File Explorer, Task View, Start, Task Manager, and others. The system tray shows the date and time as 10:24 AM 18-Nov-24.

```
Enter n value -123
Digits sum is -6_
```

```
TC
Enter n value 0
Digits sum is 0
```

Enter n value 1234567890
Digits sum is 45

The image shows a Windows desktop environment with two Command Prompt windows open, both titled "TC".

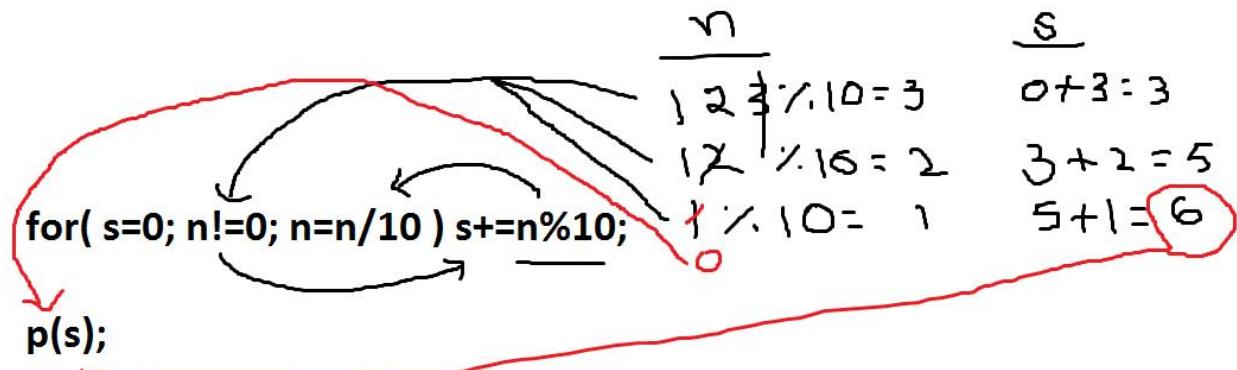
The top window displays the source code for a C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int s=0;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
for( ; n!=0;n=n/10)s=s+n%10;
printf("Digits sum is %d",s);
getch();
}
```

The bottom window shows the output of the program execution:

```
Enter n value 1257
Digits sum is 15_
```

The taskbar at the bottom of the screen contains several icons, including the Start button, File Explorer, Task View, Taskbar settings, and pinned applications like DEV, zm, Google Chrome, FileZilla, and Microsoft Word.



```

TC
File Edit Run Compile Project Options Debug Break/watch
Error: For statement missing ; in function main
#include<stdio.h>
#include<conio.h>
void main()
{
long n; int s=0;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
for( n!=0;n=n/10)s=s+n%10;
printf("Digits sum is %d",s);
getch();
}

```

Finding Armstrong no:

1 is a single digit no $\rightarrow 1^1 = 1$

2 is a single digit no $\rightarrow 2^1 = 2$

9 is a single digit no $\rightarrow 9^1 = 9$

153 is a three digit no $\rightarrow 1^3 + 5^3 + 3^3 = 1 + 125 + 27 = 153$

370, 371, 407, 1634, 8208,...

1634 is a 4 digit no == $1^4 + 6^4 + 3^4 + 4^4 = 1634$

Here power depended on no of digits.

The screenshot shows a Windows desktop environment with a terminal window open in the foreground. The terminal window has a yellow title bar labeled "TC". The code in the terminal is as follows:

```
File Edit Run Compile Project Options Debug Break/watch
Line 3 Col 17 Insert Indent Tab Fill Unindent * E:9AM.C
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int n,m,c=0,s=0,r;
clrscr();
printf("Enter n value "); scanf("%d",&n);
for(m=n;m!=0;m/=10)c++; /* counting no of digits */
for(m=n;m!=0;m/=10)
{
r=m%10;
s+=pow(r,c);
}
puts(n==s?"Armstrong no":"Not an Armstrong no");
getch();
}
```

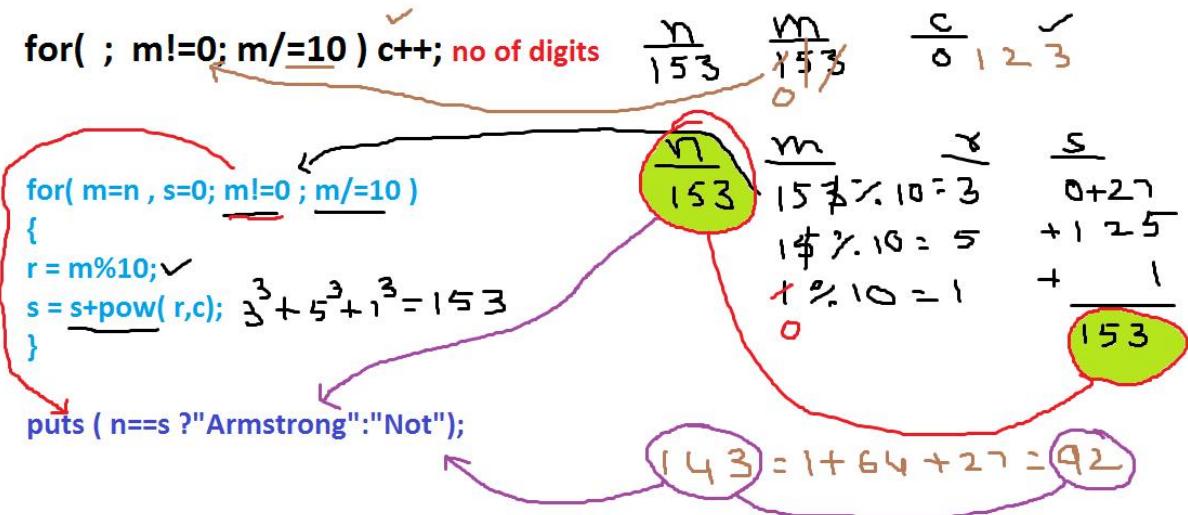
The terminal window displays the following output:

```
Enter n value 153
Armstrong no
```

The desktop taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:45 AM, 18-Nov-24.

```
TC
Enter n value 1634
Armstrong no
```

```
TC
Enter n value 1
Armstrong no
```



```

TC
Enter n value 143
Not an Armstrong no

```

Home work:

12345678 → 78 56 34 12

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program that prints the digits of a given number. The bottom window shows the execution of the program, where the user enters '100000' and the program outputs '00 00 10 -'. The desktop background is blue, and the taskbar at the bottom shows various application icons.

```
#include<stdio.h>
#include<conio.h>
void main()
{
long int n;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
if(n<0)printf("-",n=-n);
do
{
if(n>9 && n%100<10) printf("0");
printf("%-4d",n%100);n/=100;}while(n!=0);
getch();
}
```

Enter n value 100000
00 00 10 -

12345678 ==> 78 56 34 12

1234%100=34

1234/100=12

Finding perfect no: sum of factors is equal to given no.

6 factors are $1 + 2 + 3 = 6$

28 factors are $1 + 2 + 4 + 7 + 14 = 28$

$$6\%1=0$$

$$6\%2=0$$

$$6\%3=0$$

$$6\%4=2$$

$$6\%5=1$$

$$\textcolor{red}{6\%6=0}$$

$$2 \div \underline{1} = \underline{0}$$

$$\cancel{2} \div \cancel{2} = \underline{\circ}$$

$$1+2+3=6$$

The image shows a Windows desktop environment with two Command Prompt windows open, both running the Turbo C++ compiler (TC). The top window displays the source code for a C program that checks if a number is perfect. The bottom window shows the execution of the program, where it prompts for a value and then outputs 'Perfect no'.

TC

File Edit Run Compile Project Options Debug Break/watch

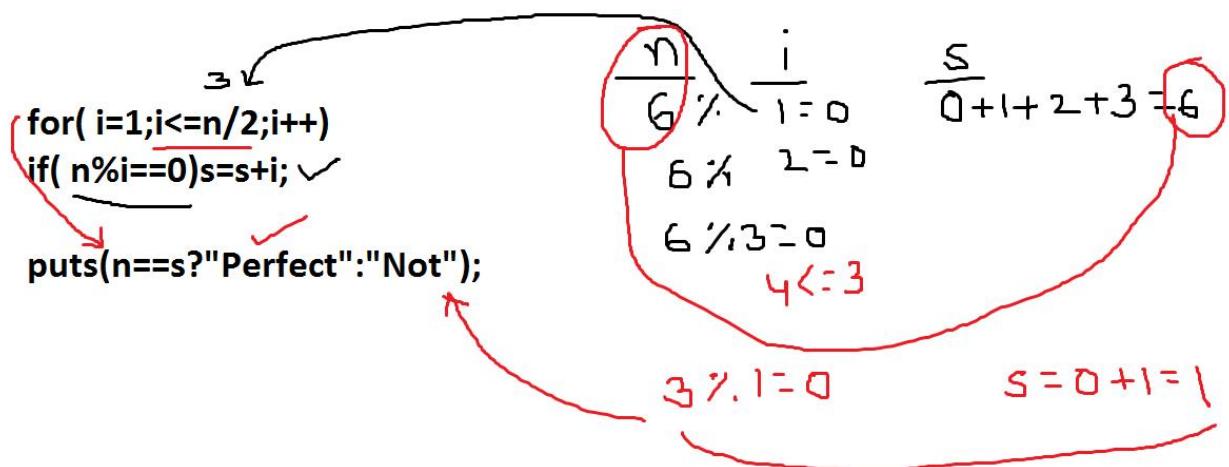
Line 9 Col 44 Insert Indent Tab Fill Unindent * E:9AM.C

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, i, s=0;
clrscr();
printf("Enter n value ");
scanf("%ld",&n);
for(i=1;i<=n/2;i++)
if(n%i==0)s+=i;
puts(n==s?"Perfect no":"Not a Perfect no");
getch();
}
```

Enter n value 6
Perfect no

```
TC
Enter n value 28
Perfect no
```

```
TC
Enter n value 4
Not a Perfect no
```



Finding prime/composite no: When a no is having 2 factors it is a prime / the no divisible with 1 and itself is called prime.

2 factors are 1 and 2 → 2 factors ← prime

3 factors are 1 and 3 → 2 factors ← prime

4 factors are 1, 2, 4 → 3 factors ← composite no

1 divisible with 1 and itself also → not a prime/composite no

The image shows a Windows desktop environment with two Command Prompt windows open. The top window is titled 'TC' and contains a C program. The bottom window is also titled 'TC' and shows the execution of the program.

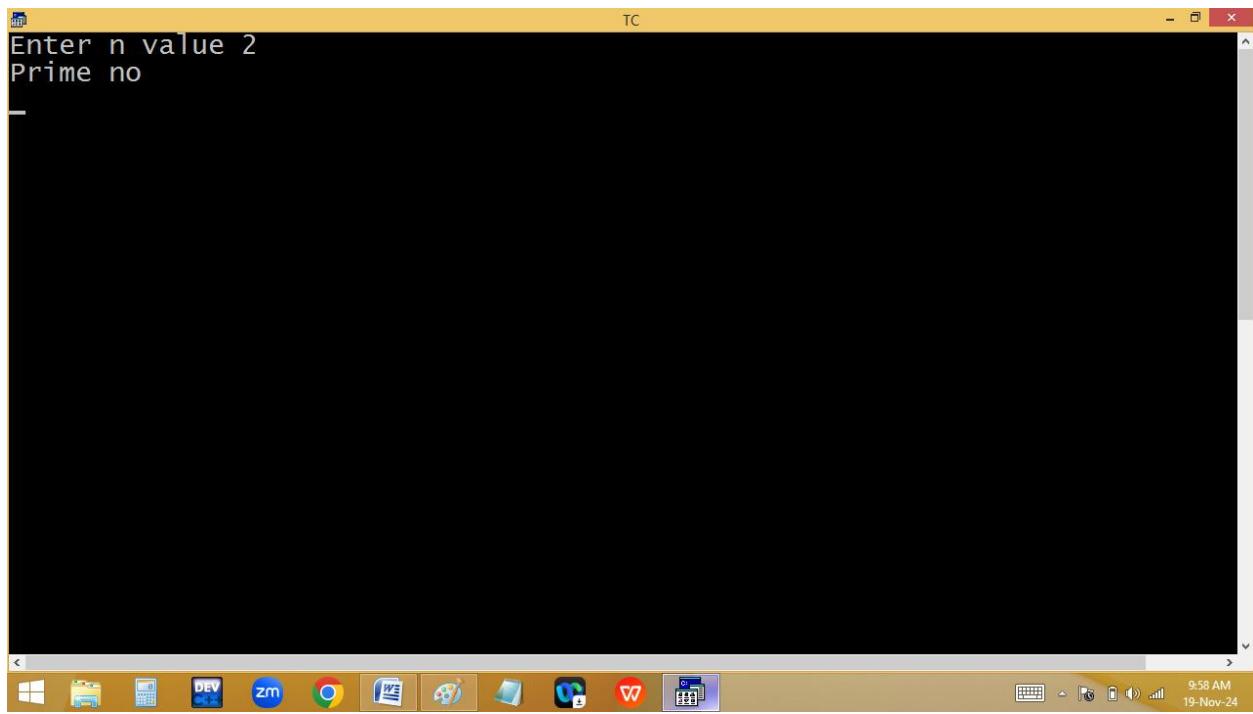
Top Window (TC):

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, i, c=0;
clrscr();
printf("Enter n value "); scanf("%d",&n);
if(n==1)puts("Not a prime/composite no");
else
{
for(i=1;i<=n;i++) if(n%i==0)c++;
puts(c==2?"Prime no":"Composite no");
}
getch();
}
```

Bottom Window (TC):

```
Enter n value 1
Not a prime/composite no
```

```
Enter n value 2
Prime no
-
```



The screenshot shows a Windows desktop environment. A terminal window titled "TC" is open, displaying the text "Enter n value 2" followed by "Prime no" and a blank line. The desktop background is black. At the bottom, a taskbar contains icons for various applications like File Explorer, Edge, and FileZilla. On the right side of the taskbar, there are system status indicators for battery level, signal strength, and the date and time (9:58 AM, 19-Nov-24).

```
Enter n value 3  
Prime no
```

```
Enter n value 4  
Composite no
```

```
for( i=1; i<=n; i++ )  
if( n%i==0)c++; ✓
```

```
puts(c==2?"Prime":"Com");
```

$$\begin{array}{ccc} \underline{n} & \underline{i} & \underline{c} \\ \hline 2 & \% & 1 = 0 \\ 2 & \% & 2 = 0 \\ \hline 3 & <= 1 \end{array} \checkmark$$

$$\begin{array}{ccc} 4 & \% & 1 = 0 \ 0 \ 1 \checkmark \\ 4 & \% & 2 = 0 \ 2 \checkmark \\ 4 & \% & 4 = 0 \ 3 \checkmark \\ \hline \end{array}$$

Method2:

The image shows a Windows desktop environment with two Command Prompt windows open. The top window is titled 'TC' and contains a C program. The bottom window is also a Command Prompt and shows the execution of the program.

Top Window (TC):

```
#include<stdio.h>
#include<conio.h>
void main()
{
long int n, i;
clrscr();
printf("Enter n value "); scanf("%ld",&n);
if(n==1)puts("Not a prime/composite no");
else
{
for(i=2;i<=n/2;i++)
{
if(n%i==0){puts("Composite no");getch();return;}
}
puts("Prime no");
}
getch();
}
```

Bottom Window:

```
Enter n value 1
Not a prime/composite no
```

```
Enter n value 2
Prime no
```

```
Enter n value 4
Composite no
```

```
Enter n value 11  
Prime no  
-
```



```
TC
Enter n value 2000000000
Composite no
```

10 - 1 2 5 10
20 - 1 2 4 5 10 20
100 - 1 2 4 5 10 20 25 50 100
5 - 1 5

for(i=2; i<=n/2;i++)
{
if(n%i==0) {p(com); return;}
p(prime);

$$\frac{n}{100 \times 2} = 0$$

$$\begin{array}{l} 11 \div 2 = 1 \\ 11 \div 3 = 2 \\ 11 \div 4 = 3 \\ 11 \div 5 = 1 \\ 6 <= 11 / 2 = 5 \end{array}$$

Fibonacci series:

n=5 → 0 1 1 2 3

The image shows a Windows desktop environment with two Command Prompt windows. Both windows have a title bar labeled 'TC' and are running the TURBO C compiler.

The top window displays the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, i, f1=0, f2=1, f3;
clrscr();
printf("Enter n value ");
scanf("%d",&n);
for(i=1;i<=n;i++)
{
printf("%4d",f1);
f3=f1+f2;
f1=f2;
f2=f3;
}
getch();
}
```

The bottom window shows the output of the program execution. It prompts the user to enter a value for 'n', which is '5'. The program then prints the first five numbers of the Fibonacci sequence: 0, 1, 1, 2, 3.

```
Enter n value 5
 0   1   1   2   3_
```

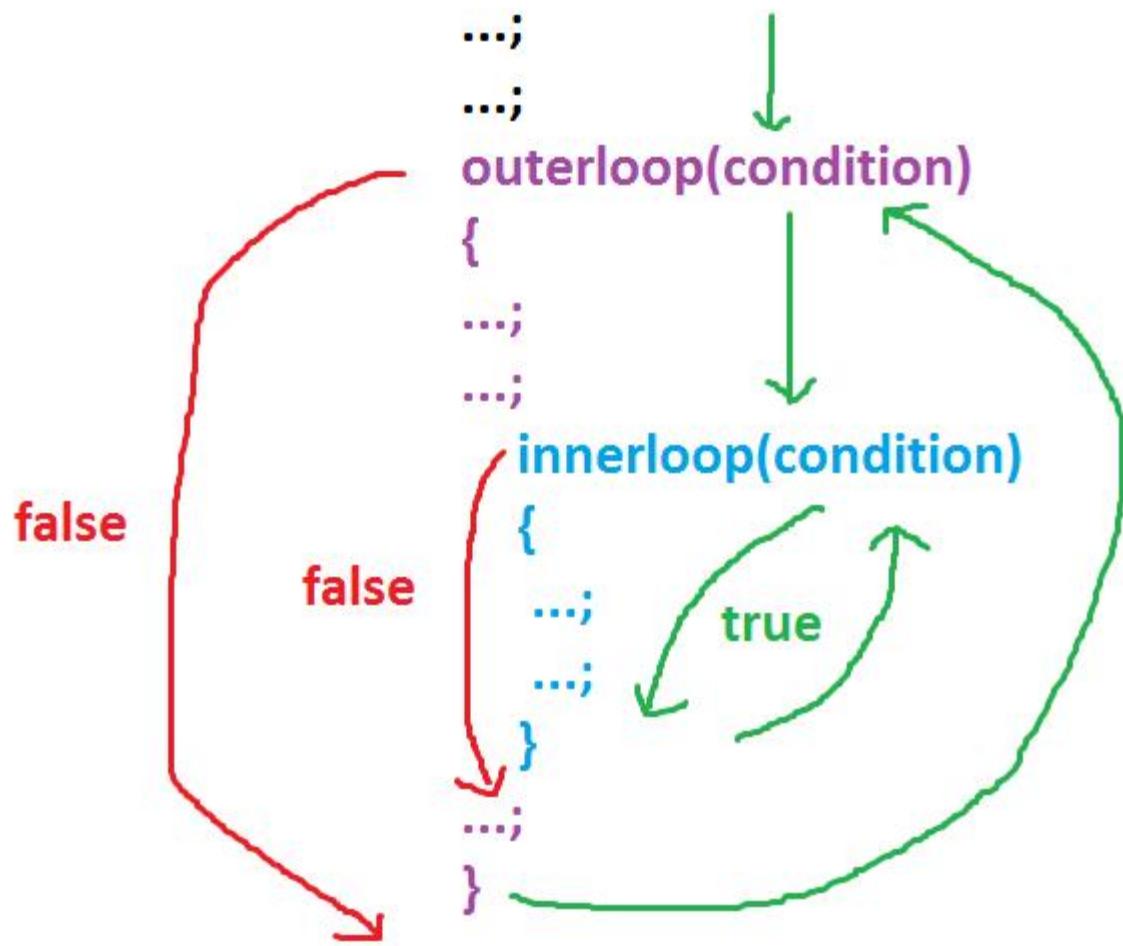
```
TC
Enter n value 10
0 1 1 2 3 5 8 13 21 34_
```

```
for( i=1; i<=n; i++ )  
{  
    p(f1); ✓  
    f3=f1+f2;  
    f1=f2; f2=f3;  
}
```

$$\frac{i \leq n}{1 - 5} \quad \begin{matrix} f_1 & f_2 & f_3 \\ \checkmark 0 & + 1 & = 1 \\ \checkmark 1 & + 1 & = 2 \\ \checkmark 1 & + 2 & = 3 \\ \checkmark 2 & + 3 & = 5 \\ \checkmark 3 & & \end{matrix}$$

0 1 1 2 3

Nested loops: Loop within loop



Printing n tables:

3 tables

The screenshot shows a Windows desktop environment with two open windows. The top window is a Text Editor titled 'TC' with the file name 'E:9AM.C'. It contains the following C code:

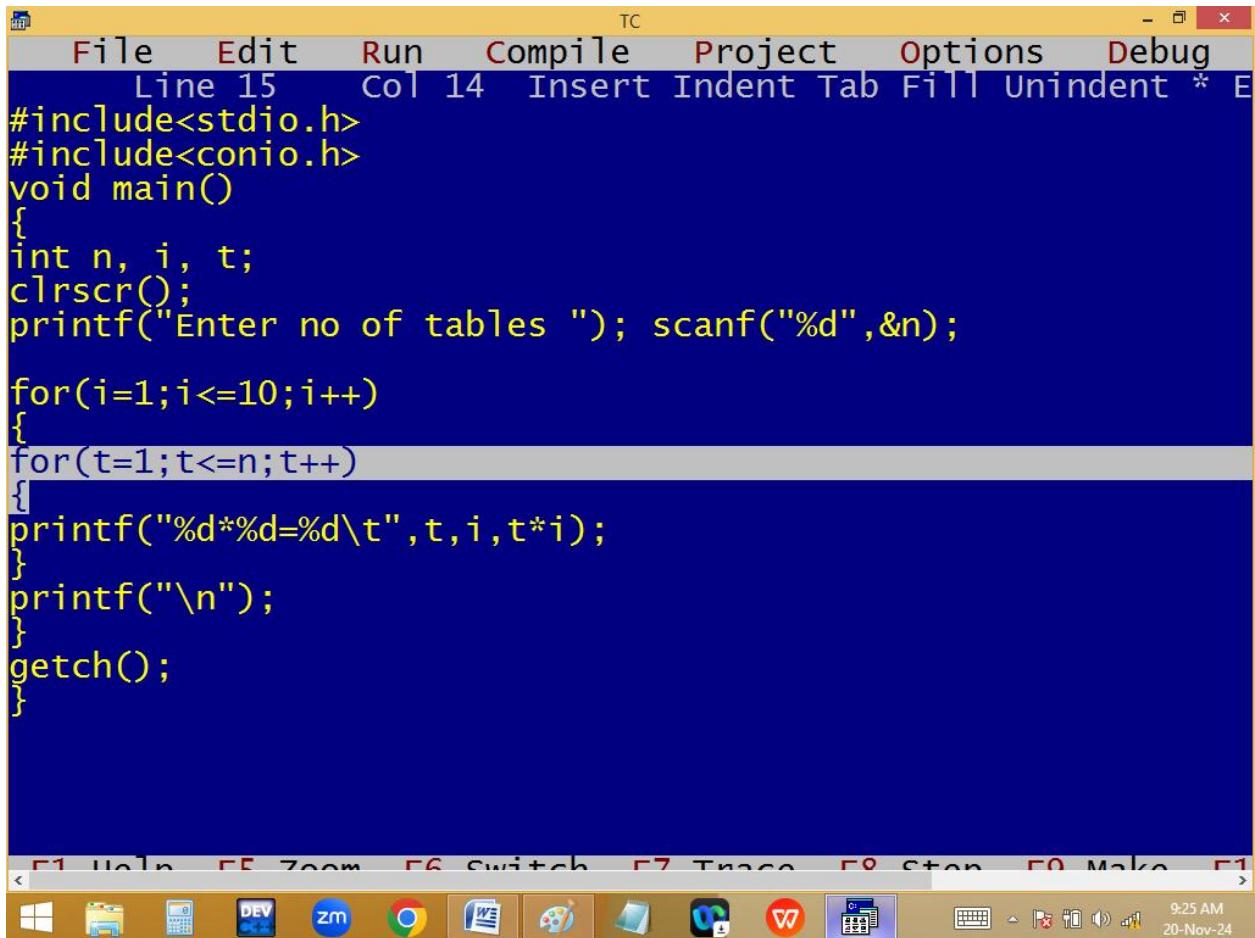
```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, i, t;
clrscr();
printf("Enter no of tables "); scanf("%d",&n);
for(t=1;t<=n;t++)
{
for(i=1;i<=10;i++)
{
printf("%d*d=%d\n",t,i,t*i);
}
}
getch();
}
```

The bottom window is a Command Prompt window. It displays the output of the program. The user enters '2' when prompted 'Enter no of tables'. The program then prints the multiplication tables for 1 and 2.

```
Enter no of tables 2
1*1=1
1*2=2
1*3=3
1*4=4
1*5=5
1*6=6
1*7=7
1*8=8
1*9=9
1*10=10
2*1=2
2*2=4
2*3=6
2*4=8
2*5=10
2*6=12
2*7=14
2*8=16
2*9=18
2*10=20
```

Home work: Tables side by side

Tables side by side:



The screenshot shows a window titled "TC" representing the Turbo C++ IDE. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 15, Col 14, Insert, Indent, Tab, Fill, Unindent, and Exit. The main code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n, i, t;
    clrscr();
    printf("Enter no of tables ");
    scanf("%d", &n);

    for(i=1;i<=10;i++)
    {
        for(t=1;t<=n;t++)
        {
            printf("%d*%d=%d\t", t, i, t*i);
        }
        printf("\n");
    }
    getch();
}
```

The status bar at the bottom shows various icons and the system time: 9:25 AM, 20-Nov-24.

```
TC
Enter no of tables 3
1*1=1 2*1=2 3*1=3
1*2=2 2*2=4 3*2=6
1*3=3 2*3=6 3*3=9
1*4=4 2*4=8 3*4=12
1*5=5 2*5=10 3*5=15
1*6=6 2*6=12 3*6=18
1*7=7 2*7=14 3*7=21
1*8=8 2*8=16 3*8=24
1*9=9 2*9=18 3*9=27
1*10=10 2*10=20 3*10=30
```

```
for( i=1; i<=10; i++ )  
{  
    for( t=1; t<=3; t++ )  
    {  
        p(t*i\|t");  
    }  
    p("\n");  
}
```

✓
t
1 2 3 4 * 2
1 2 3
- -
|Q

1*1=1 2*1=2 3*1=3 10*1=10

Finding generic root of given no.

$$5677 = 5+6+7+7=25 \rightarrow 2+5=7$$

TC

File Edit Run Compile Project Options Debug

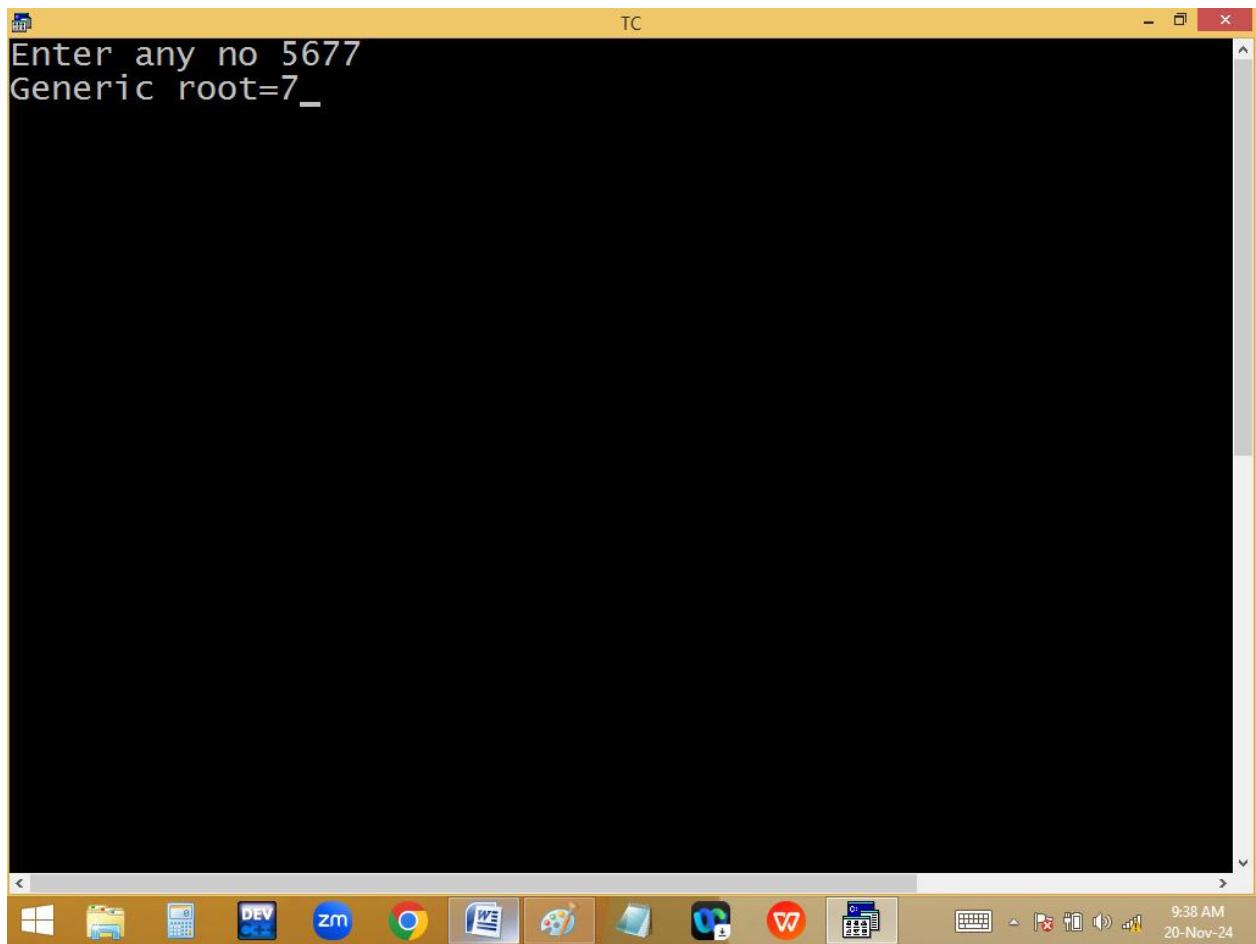
Line 16 Col 29 Insert Indent Tab Fill Unindent * E

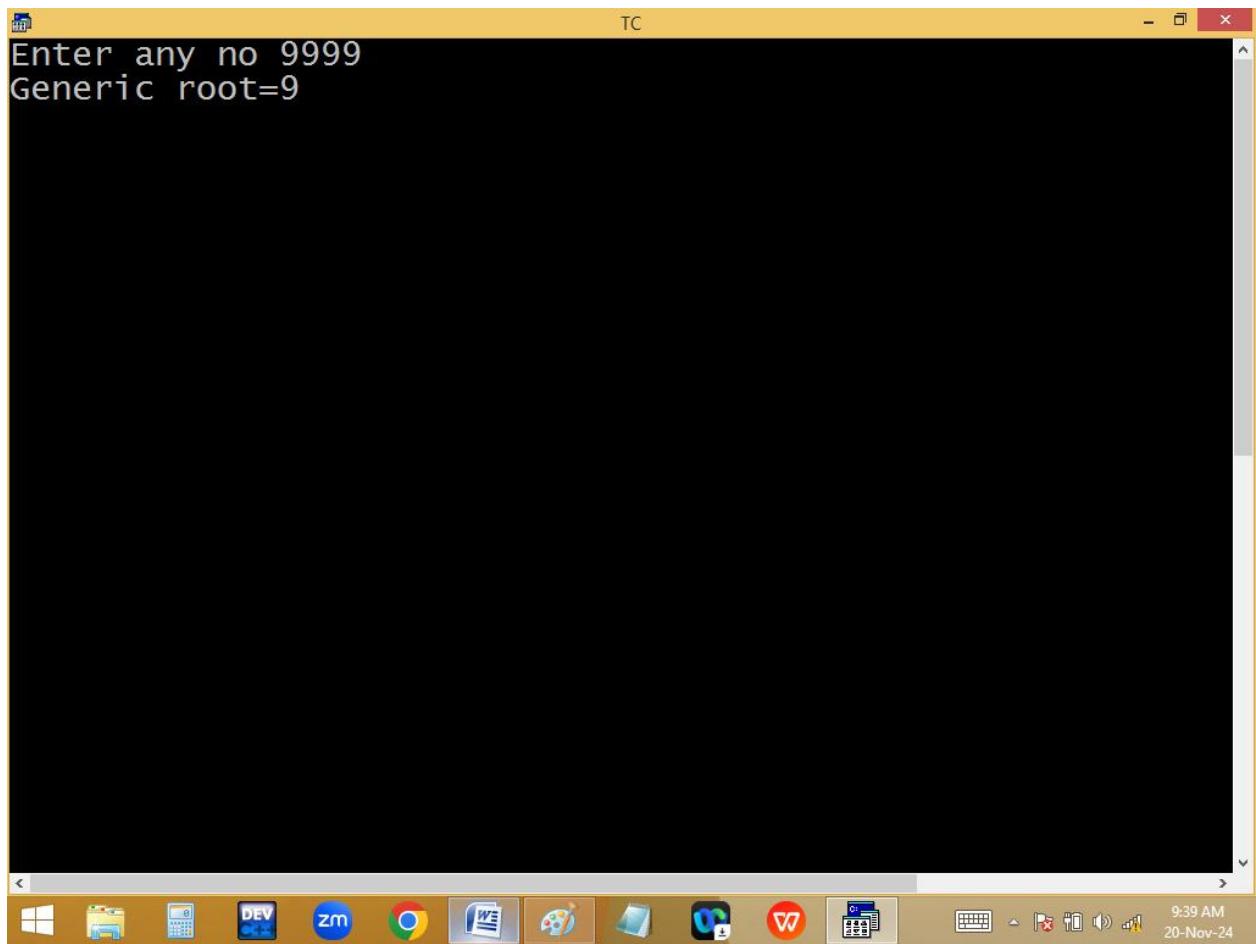
```
#include<stdio.h>
#include<conio.h>
void main()
{
long n, s=0;
clrscr();
printf("Enter any no "); scanf("%ld",&n);
while(n>9)
{
for(s=0;n!=0;n=n/10)
{
s=s+n%10;
}
n=s;
}
printf("Generic root=%d",s);
getch();
}
```

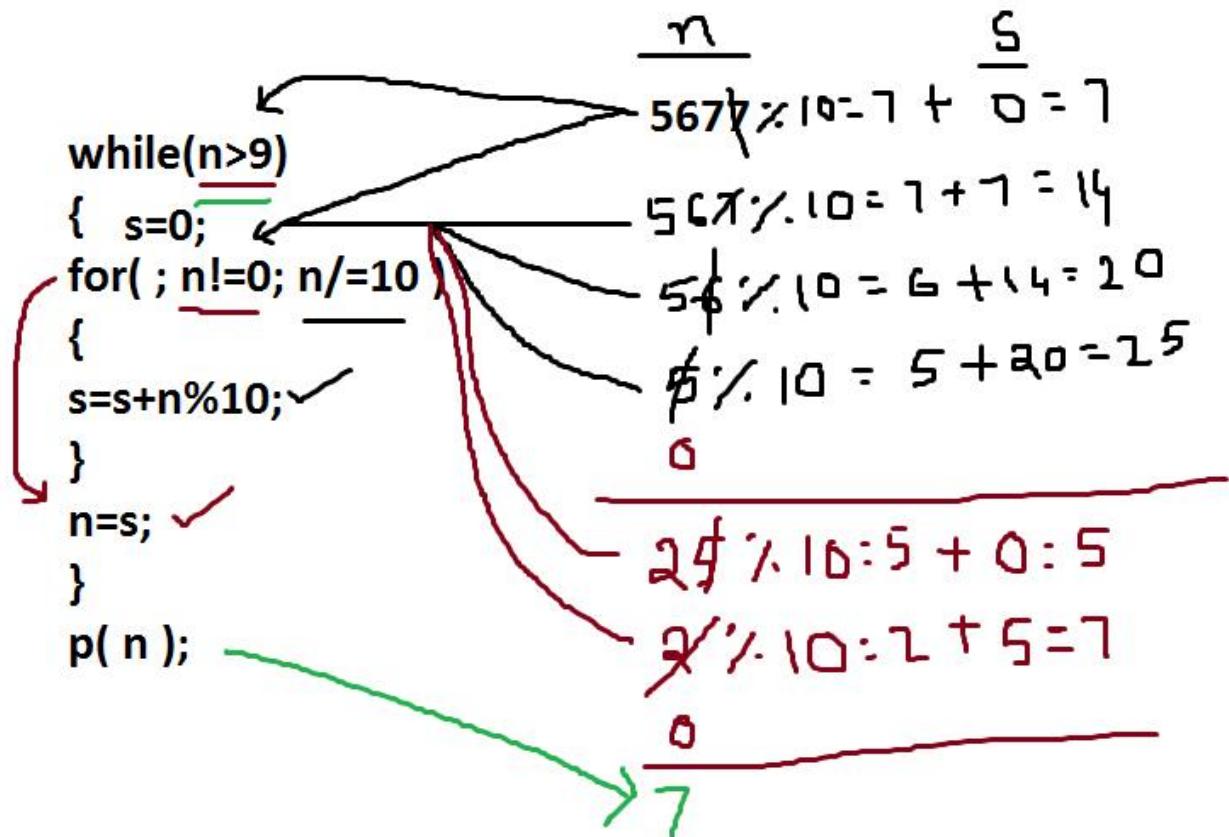
F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:38 AM
20-Nov-24







Finding strong no or not?

1 factorial is 1

2 factorial is 2

$$145 \rightarrow 1! + 4! + 5! = 1 + 24 + 120 = 145$$

$$123 \rightarrow 1! + 2! + 3! = 1 + 2 + 6 = 9 \leftarrow \text{not a strong no}$$

TC

File Edit Run Compile Project Options Debug

Line 16 Col 42 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,m,r,f,s=0;
clrscr();
printf("Enter any no "); scanf("%d",&n);
for(m=n;m!=0;m=m/10)
{
for(r=m%10,f=1;r>1;r--)
{
f=f*r;
}
s+=f;
}
puts(n==s?"Strong no":"Not a Strong no");
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:48 AM
20-Nov-24

```
TC
Enter any no 1
Strong no
```

Windows Start button File Explorer Task View Taskbar icon zM Google Chrome Microsoft Edge Paint Mail Word Calendar Keyboard Mouse Volume Date and Time: 9:48 AM Date: 20-Nov-24

```
TC
Enter any no 2
Strong no
```



```
TC
Enter any no 145
Strong no
```



```
TC
Enter any no 123
Not a Strong no
```

```
for(m=n;m!=0;m/=10)
{
    for(r=m%10,f=1;r>1;r--)f=f*r;
    s=s+f;
}
puts(n==s?"Strong":"Not");
```

$$\begin{array}{r} \frac{n}{145} \\ \frac{m}{145} \times 10 = 50 : 100 \\ 145 \times 10 = 450 = 24 \\ 145 \times 10 = 10 = 1 \\ \hline 145 \end{array}$$

Printing 1..n palindrome no's and count:

n=50 → 1...9

The screenshot shows a Microsoft Windows operating system interface. At the top is the Windows title bar. Below it is a menu bar with File, Edit, Run, Compile, Project, Options, and Debug. A status bar at the bottom displays "Line 17 Col 30". The main area contains a C program for finding palindromes. The taskbar at the bottom has icons for various applications like File Explorer, Control Panel, and Microsoft Word. The system tray shows the date and time as 10:02 AM on 20-Nov-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,a,b,r,rev,c=0;
clrscr();
printf("Enter any no "); scanf("%d",&n);
for(a=1;a<=n;a++)
{
for(b=a,rev=0;b!=0;b/=10)
{
r=b%10;
rev=rev*10+r;
}
if(a==rev)printf("%4d",a,c++);
}
printf("\n%d palindromes",c);
getch();
}
```

```
TC
Enter any no 50
 1 2 3 4 5 6 7 8 9 11 22 33 44
13 palindromes
```



TC

```
Enter any no 200
  1   2   3   4   5   6   7   8   9   11  22  33  44  55  6
  121 131 141 151 161 171 181 191
28 palindromes_
```

```
for( a=1; a<=n; a++ )
{
    for(b=a, rev=0; b!=0; b/=10)
    {
        r=b%10;
        rev=rev*10+r;
    }
    puts(a==rev)p(a,c++);
}
p(c no of palindromes");
```

$$\begin{array}{ccccccc}
 n & \frac{a}{50} \rightarrow \frac{b}{1} & \frac{1}{10} = & \frac{1}{1} & \frac{1}{10} & \frac{1}{10} & \frac{1}{10} \\
 & \checkmark & 1 & 1 & 1 & 1 & 1 \\
 & \checkmark & 2 & 2 & 2 & 2 & 2 \\
 & \times & 10 & 10 & 10 & 10 & 10 \\
 & & 1 & 1 & 1 & 1 & 1 \\
 & \checkmark & 11 & 11 & 11 & 11 & 11
 \end{array}$$

50

Print 1..n primes and count:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 16 Col 17 Insert Indent Tab Fill Unindent * E". The main code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,a,b,f,c=0;
clrscr();
printf("Enter any no "); scanf("%d",&n);
for(a=2;a<=n;a++)
{
for(b=1,f=0;b<=a;b++)
{
if(a%b==0)f++;
}
if(f==2)printf("%4d",a,c++);
}
printf("\n%d primes",c);
getch();
}
```

The taskbar at the bottom of the screen displays various application icons, including Windows Explorer, File Explorer, Task View, DEV, zm, Google Chrome, File Manager, Paint, FileZilla, Word, and Filezilla. The system tray shows the date and time as "10:14 AM 20-Nov-24".

```
TC
Enter any no 10
      2      3      5      7
4 primes
```



```
TC
Enter any no 50
 2   3   5   7   11  13  17  19  23  29  31  37  41  43  4
15 primes_
```



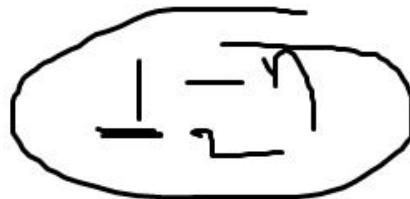
```

for ( a=2; a<=n ; a++ ) ✓
{
    for(b =1;b<=a; b++)
    {
        if(a%b==0)f++;
    }
    if(f==2)p(a,c++);
}
p(c no of primes);

```

$$\frac{n}{10} \quad \frac{a}{2} \% 1 = 0$$

2 = 0



$\frac{n}{10}$	\checkmark	$\frac{a}{2} \% 1 = 0$	$\frac{f}{0} 1 L$	\checkmark	$\frac{c}{0}$
$2 \% 1 = 0$					1
$\checkmark 3 \% 1 = 0$		$0 1 2$	\checkmark		2
$3 \% 3 = 0$					
$\times 4 \% 1 = 0$			$0 1 2 3$		
$4 \% 2 = 0$					
$\checkmark 4 \% 4 = 0$					
$5 \% 1 = 0$		$0 1 2$			3
$5 \% 5 = 0$					

Print n to n primes and count:

TC

File Edit Run Compile Project Options Debug

Line 9 Col 28 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,a,b,f,c=0;
clrscr();
printf("Enter starting and ending no's ");
scanf("%d%d",&a,&n);
if(a>n){int t=a; a=n;n=t; }_
for(;a<=n;a++)
{
for(b=1,f=0;b<=a;b++)
{
if(a%b==0)f++;
}
if(f==2)printf("%4d",a,c++);
printf("\n%d primes",c);
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



10:26 AM
20-Nov-24

TC

```
Enter starting and ending no's 25 10
  11 13 17 19 23
5 primes
```

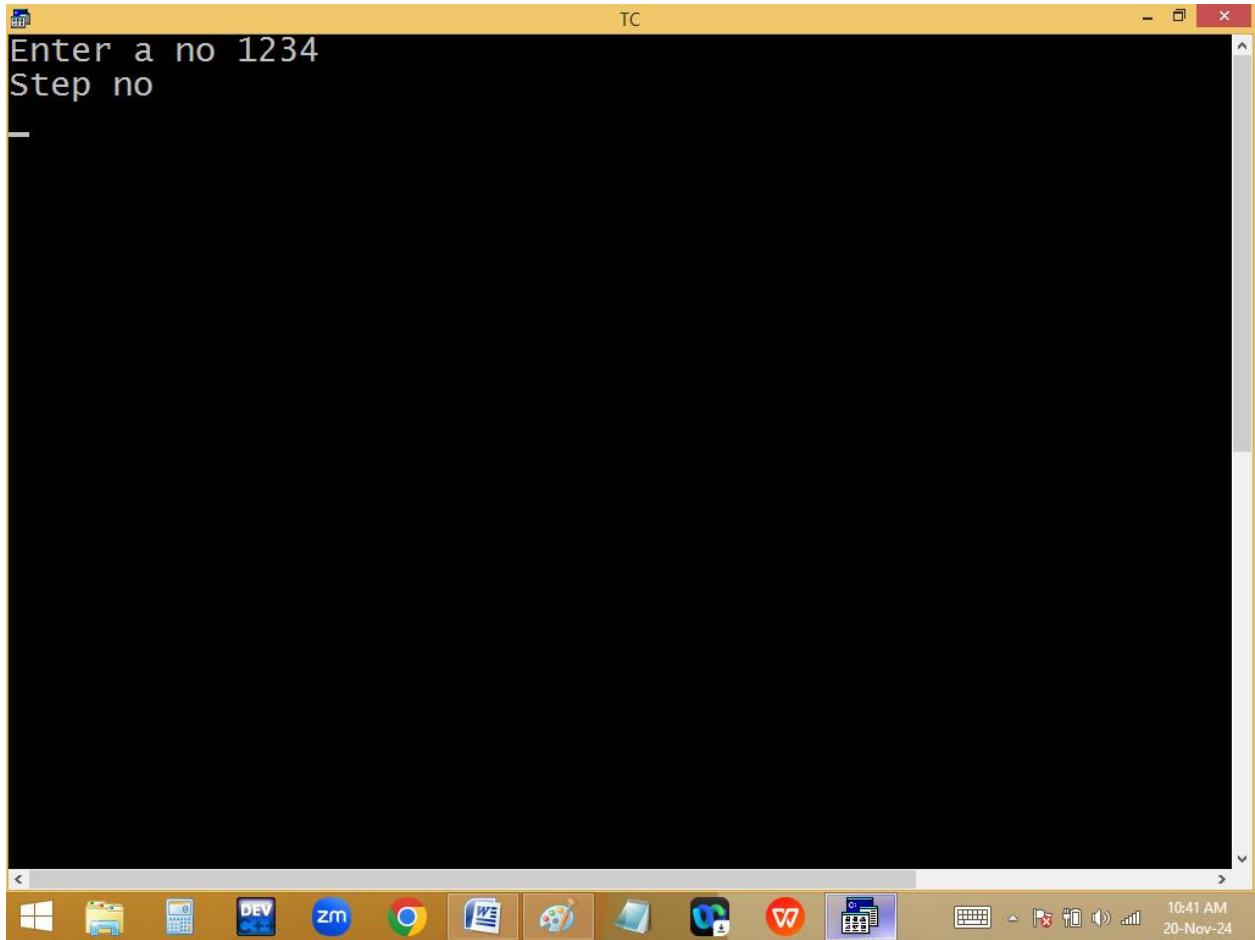
Windows taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, File Explorer, Paint, Mail, Word, Calendar. Date and time: 10:26 AM, 20-Nov-24.

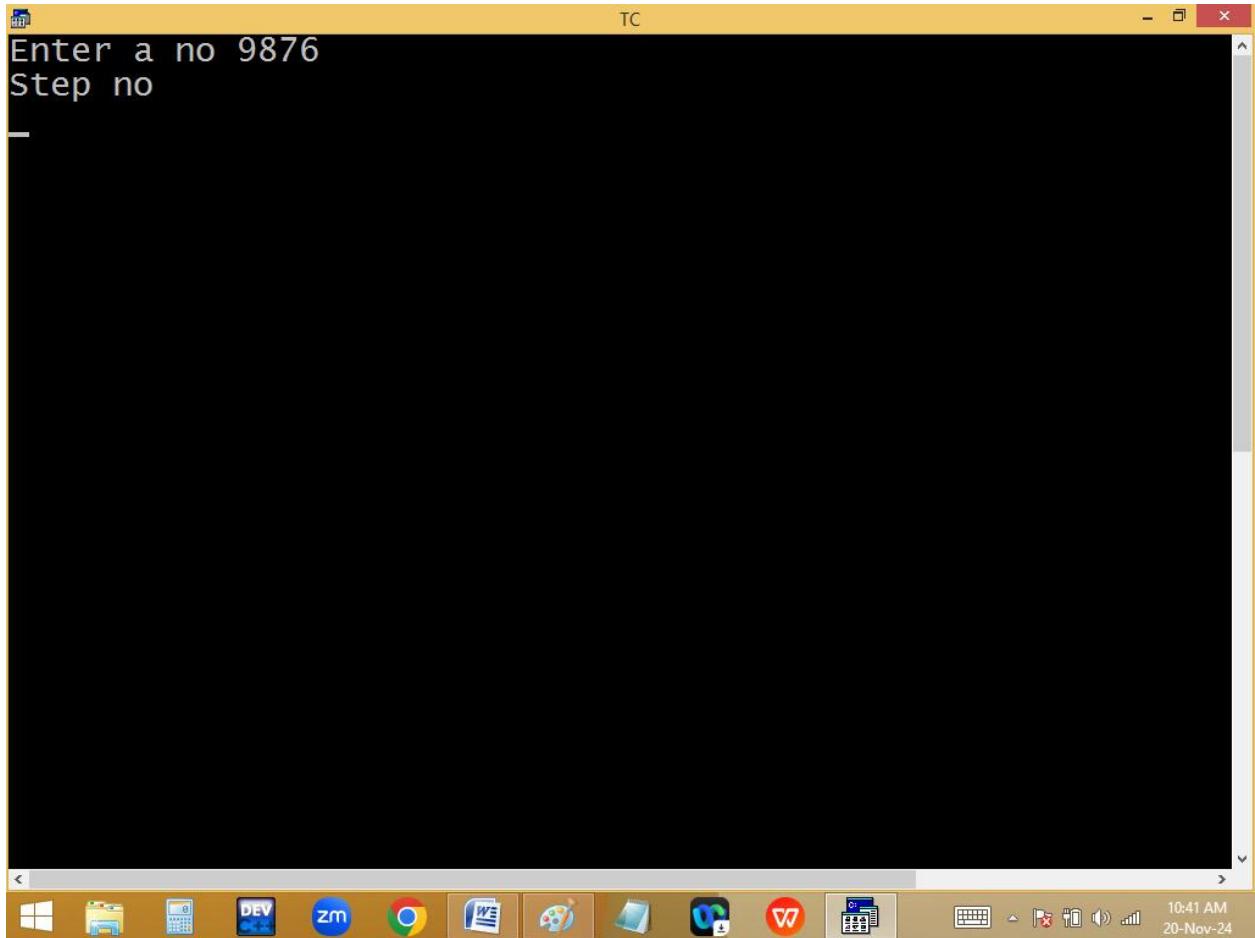
Finding step no:

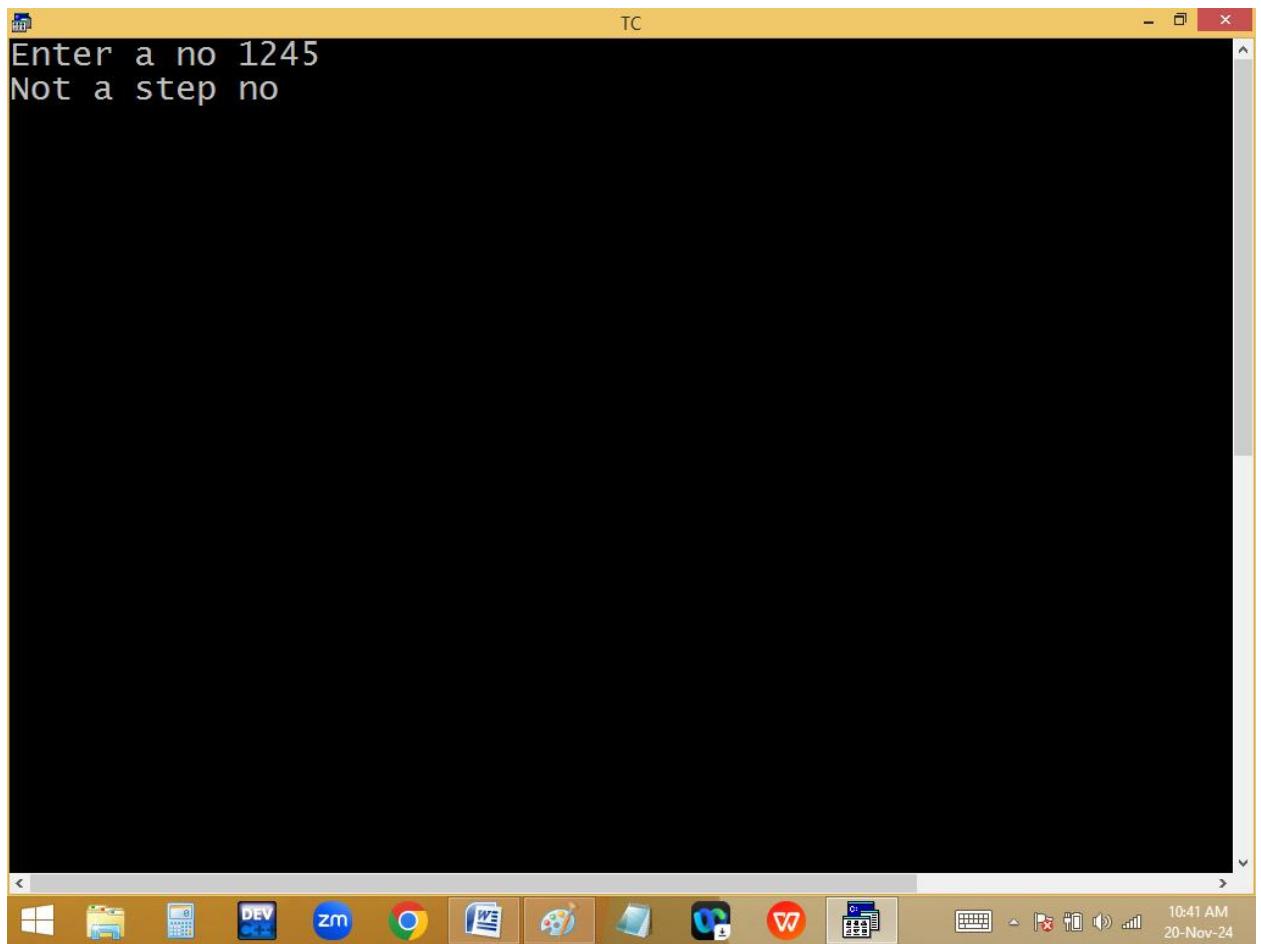
1234 → all the digits difference is 1

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 13, Col 37. The code area contains a C program to determine if a given number is a step number. It uses standard input-output libraries and a loop to check each digit of the number.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    long n,r1,r2;
    clrscr();
    printf("Enter a no ");
    scanf("%ld",&n);
    for( r1=n%10, n=n/10; n!=0; n/=10)
    {
        r2=n%10;
        if(r1-r2==1||r2-r1==1)r1=r2;
        else {puts("Not a step no");getch();_return; }
    }
    puts("Step no");
    getch();
}
```







```
TC
Enter a no 10101
Step no
-
```

Windows Taskbar icons: File Explorer, File Manager, Task View, DEV, zm, Google Chrome, File Explorer, Paint, Mail, Word, Calendar. Date/Time: 10:42 AM 20-Nov-24

```
r1 = n%10;
n=n/10;
for ( ; n!=0; n/=10 )
{
    r2 = n%10;
    if(r1-r2==1 || r2-r1==1) r1=r2;
    else p(not); return;
}
p(step no);
```

$$\begin{array}{r} \underline{1} \\ 12345 \end{array} \div 10 = \overline{1} \leftarrow \begin{array}{l} 2 \\ 3 \\ 4 \\ 5 \end{array}$$
$$\begin{array}{r} \underline{1} \\ 1234 \end{array} \div 10 = \overline{3} \leftarrow \begin{array}{l} 2 \\ 3 \end{array}$$
$$\begin{array}{r} \underline{1} \\ 123 \end{array} \div 10 = \overline{1} \leftarrow \begin{array}{l} 2 \\ 3 \end{array}$$

786

Automorphic no:

$$n=5 \rightarrow 5 * 5 = 25$$

$$n=25 \rightarrow 25 * 25 \rightarrow 625$$

Patterns:

The screenshot shows a window titled "TC" (Turbo C++) with a menu bar including File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom displays "Line 17 Col 1 Insert Indent Tab Fill Unindent * E". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("*");
}
printf("\n");
}
getch();
}
```

The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 9:40 AM on 21-Nov-24.

```
TC
Enter no of rows and columns 3 4
*****
*****
*****
```

The image shows a Windows operating system desktop environment. A terminal window titled 'TC' is open, displaying the output of a program that asks for the number of rows and columns and then prints a pattern of asterisks. Below the terminal is a standard Windows taskbar with several pinned icons, including File Explorer, Edge, Google Chrome, Paint, and File History. The taskbar also displays the date and time as 9:40 AM on 21-Nov-24.

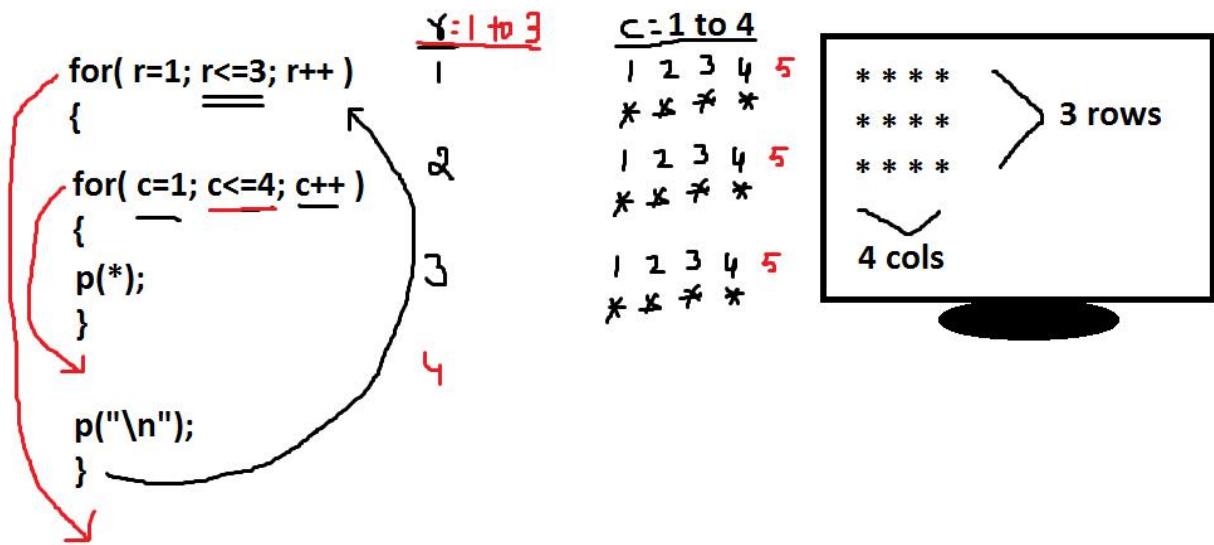
The screenshot shows a window titled "TC" (Turbo C++) with a menu bar including File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates "Line 13 Col 11 Insert Indent Tab Fill Unindent * E". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("* ");
}
printf("\n");
}
getch();
}
```

The taskbar at the bottom shows various application icons, and the system tray displays the date and time as "9:41 AM 21-Nov-24".

TC

```
Enter no of rows and columns 7 10
* * * * * * *
* * * * * * *
* * * * * * *
* * * * * * *
* * * * * * *
* * * * * * *
* * * * * * *
```



TC

File Edit Run Compile Project Options Debug

Line 13 Col 15 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%3d",c);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:43 AM
21-Nov-24

```
TC
Enter no of rows and columns 5 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
```

```
for( r=1; r<=3; r++ )  
{  
    for( c=1; c<=4; c++ )  
    {  
        p( c );  
    }  
    p("\n");  
}
```

TC

File Edit Run Compile Project Options Debug

Line 13 Col 15 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%3d",r);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:44 AM
21-Nov-24

```
TC
Enter no of rows and columns 10 9
1 1 1 1 1 1 1 1 1
2 2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3 3
4 4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5 5
6 6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9 9
10 10 10 10 10 10 10 10 10
```



The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window displays "Line 13 Col 18 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

Below the window, the Windows taskbar is visible, featuring icons for various applications like File Explorer, Control Panel, and Device Manager. The system tray shows the date and time as "9:46 AM 21-Nov-24".

```
TC
Enter no of rows and columns 10 26
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
```



TC

File Edit Run Compile Project Options Debug

Line 13 Col 16 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%2c",96+c);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:47 AM
21-Nov-24

```
TC
Enter no of rows and columns 10 26
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
a b c d e f g h i j k l m n o p q r s t u v w x y z
```



9:47 AM
21-Nov-24

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 13, Col 18, and various editing options like Insert, Indent, Tab, Fill, Unindent, and End. The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%2c",96+r);
}
printf("\n");
}
getch();
}
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and Run. The taskbar at the bottom right shows the date and time as 9:47 AM, 21-Nov-24.

```
TC
Enter no of rows and columns 5 5
a a a a a
b b b b b
c c c c c
d d d d d
e e e e e
```



The screenshot shows a Windows desktop environment. A command-line window titled 'TC' is open, displaying a 5x5 grid of lowercase letters (a-e) repeated across five columns. Below the taskbar, several pinned application icons are visible, including File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer again, Paint, File Explorer again, OneDrive, Word, and File Explorer again. The taskbar also shows the date and time as '9:48 AM 21-Nov-24'.

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window displays "Line 13 Col 16 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
printf("%2c",64+r);
}
printf("\n");
}
getch();
}
```

Below the window, the Windows taskbar is visible, featuring icons for various applications like File Explorer, Control Panel, and Device Manager. The system tray shows the date and time as "9:48 AM 21-Nov-24".

```
TC
Enter no of rows and columns 7 7
A A A A A A A
B B B B B B B
C C C C C C C
D D D D D D D
E E E E E E E
F F F F F F F
G G G G G G G
```



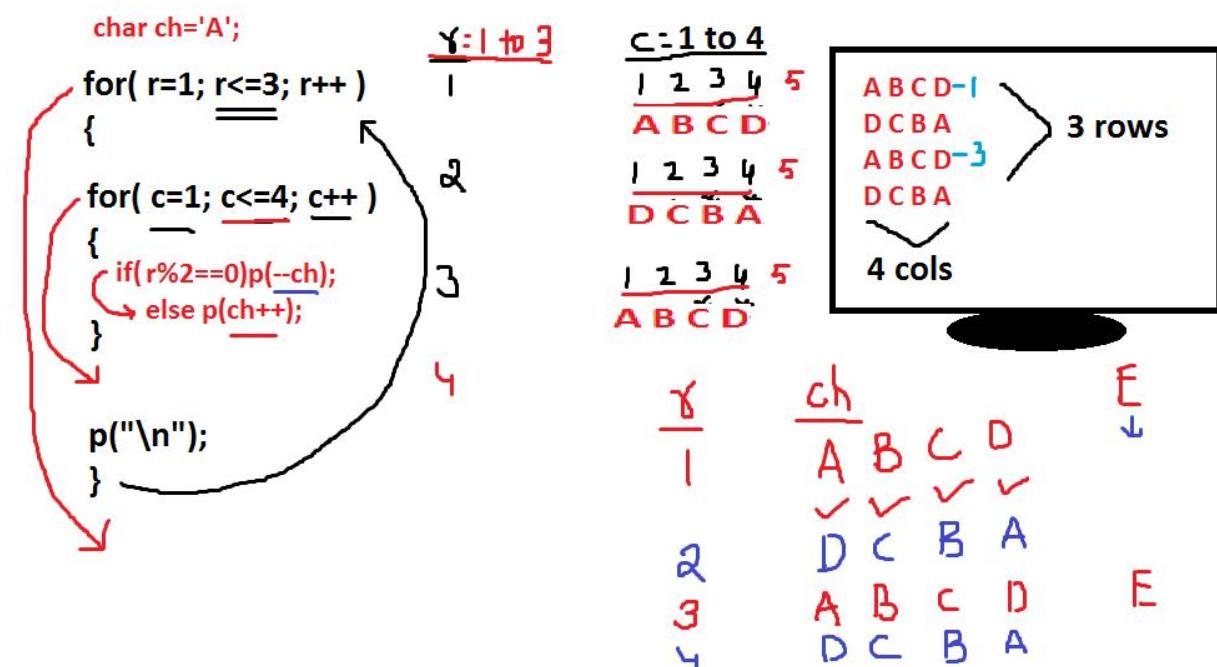
The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 13 Col 55 Insert Indent Tab Fill Unindent * E". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int nr,nc,r,c; char ch='A';
    clrscr();
    printf("Enter no of rows and columns ");
    scanf("%d %d",&nr,&nc);
    for( r=1; r<=nr; r++ )
    {
        for( c=1; c<=nc; c++ )
        {
            if(r%2==0)printf("%2c",--ch); else printf("%2c",ch++);
        }
        printf("\n");
    }
    getch();
}
```

The taskbar at the bottom of the screen displays various application icons, including Windows File Explorer, Task View, Task Manager, Zoom, Switch, Trace, Stop, Make, and several others. The system tray shows the date and time as "9:56 AM 21-Nov-24".

TC

```
Enter no of rows and columns 5 26
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
```



TC

File Edit Run Compile Project Options Debug

Line 14 Col 53 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
char ch=64+nc;
for( c=1; c<=nc; c++ )
{
if(r%2==0)printf("%2c",ch--); else printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:04 AM
21-Nov-24

TC

```
Enter no of rows and columns 8 26
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A
```

for(r=1; r<=3; r++) $r = 1 \text{ to } 3$

{ char ch=64+nc;

 for(c=1; c<=4; c++) $c = 1 \text{ to } 4$

 { if(r%2==0)p(ch--);

 } else p(64+c);

 }

 p("\n");

}

1 $1 \ 2 \ 3 \ 4 \ 5$

2 $A \ B \ C \ D$

3 $1 \ 2 \ 3 \ 4 \ 5$

4 $D \ C \ B \ A$

ABCD-1
DCBA
ABCD-3
DCBA

3 rows

4 cols

$ch = 64 + 4 = 68 \ 67 \ 66 \ 65$

D C B A
A B C D

1
2
3
4

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 13, Col 51. The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
if(r%2==0)printf("%2c",96+c); else printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

The taskbar at the bottom shows various application icons, and the system tray displays the date and time as 10:08 AM on 21-Nov-24.

```
TC
Enter no of rows and columns 10 26
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u v w x y z
```



The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom displays "Line 13 Col 4 TC". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
if(c%2==0)printf("%2c",96+c); else printf("%2c",64+c);
}
printf("\n");
}
getch();
}
```

The taskbar at the bottom shows various pinned icons, including Windows Start, File Explorer, Task View, DEV, Zoom, Switch, Trace, Stop, Make, and others. The system tray indicates the date and time as 10:10 AM on 21-Nov-24.

```
TC
Enter no of rows and columns 10 26
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
A b C d E f G h I j K l M n O p Q r S t U v W x Y z
```



TC

File Edit Run Compile Project Options Debug

Line 15 Col 38 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c; char L='a', U='A';
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
for( c=1; c<=nc; c++ )
{
if(r%2==0)printf("%2c",L); else printf("%2c",U);
}
printf("\n"); if(r%2==0)L++;else U++;
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:21 AM
21-Nov-24

```
TC
Enter no of rows and columns 10 20
A A A A A A A A A A
a a a a a a a a a a
B B B B B B B B B B
b b b b b b b b b b
C C C C C C C C C C
c c c c c c c c c c
D D D D D D D D D D
d d d d d d d d d d
E E E E E E E E E E
e e e e e e e e e e
```



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 17, Col 1, and various editing options like Insert, Indent, Tab, Fill, Unindent, and End. The code area contains a C program that prompts the user for rows and columns, then prints a diamond pattern of lowercase and uppercase letters. The taskbar at the bottom shows icons for various applications including Windows, File Explorer, Task View, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as 10:32 AM on 21-Nov-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
char L='a', U='A';
for( c=1; c<=nc; c++ )
{
if(c%2==0)printf("%2c",L++); else printf("%2c",U++);
}
printf("\n");
}
getch();
}
```

TC

```
Enter no of rows and columns 10 26
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
A a B b C c D d E e F f G g H h I i J j K k L l M m
```

Windows Taskbar: 10:32 AM 21-Nov-24

$r=1 \text{ to } 3$

$c=1 \text{ to } 4$

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

3 rows

4 cols

```

for( r=1; r<=3; r++ )
{
    char L='a', U='A';
    for( c=1; c<=4; c++ )
    {
        if(c %2==0) p( L++ );
        else p( U++ );
    }
    if(r%2==0)L++;else U++;
    p("\n");
}

```

1 2 3 4 5 6

A a B b C c

TC

File Edit Run Compile Project Options Debug

Line 14 Col 19 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c,a;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{
a=r;
for( c=1; c<=nc; c++ )
{
printf("%3d",a++);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



10:36 AM
21-Nov-24

```
TC
Enter no of rows and columns 4 4
1 2 3 4
2 3 4 5
3 4 5 6
4 5 6 7
```

for(r=1; r<=3; r++) ✓
{ int a=r; ✓
for(c=1; c<=4; c++)
{
p(a++); ✓
}
}
p("\n");

r=1 to 3 c=1 to 4

1 | 1 2 3 | 1 2 3 4 5
2 | 2 3 4 | 1 2 3 4 5
3 | 3 4 5 | 1 2 3 4 5
4 | 4 5 6 | 1 2 3 4 5

3 rows
4 cols

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 13, Col 19, and various editing options like Insert, Indent, Tab, Fill, Unindent, and End. The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int nr,nc,r,c;
    clrscr();
    printf("Enter no of rows and columns ");
    scanf("%d %d",&nr,&nc);
    for( r=1; r<=nr; r++ )
    {
        for( c=1; c<=nc; c++ )
        {
            printf("%3d",r+c-1);
        }
        printf("\n");
    }
    getch();
}
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and Run. The system tray shows the date and time as 10:40 AM on 21-Nov-24.

```

TC
Enter no of rows and columns 5 7
1 2 3 4 5 6 7
2 3 4 5 6 7 8
3 4 5 6 7 8 9
4 5 6 7 8 9 10
5 6 7 8 9 10 11

```

for(r=1; r<=3; r++) ✓
 {
 for(c=1; c<=4; c++)
 {
 p(r+c-1);
 }
 p("\n");

r = 1 to 3 c = 1 to 4
 1 1 2 3 4 5
 2 1 2 3 4 5
 3 1 2 3 4 5
 4 1 2 3 4 5

1 2 3 4	-1	>	3 rows
2 3 4 5	-2		
3 4 5 6	-3		
4 5 6 7	-4		

4 cols

$1+1-1=1$ $1+2-1=2$ $1+3-1=3$ $1+4-1=4$
 $2+1-1=2$ $2+2-1=3$ $2+3-1=4$ $2+4-1=5$
 $3+1-1=3$ $3+2-1=4$ $3+3-1=5$ $3+4-1=6$

TC

File Edit Run Compile Project Options Debug

Line 13 Col 50 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int nr,nc,r,c,a;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
for( r=1; r<=nr; r++ )
{ a=nc;
for( c=1; c<=nc; c++ )
{
if(r%2==0)printf("%3d",a--);else printf("%3d",c);_
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:45 AM
21-Nov-24

```
TC
Enter no of rows and columns 7 8
1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8
```



TC

File Edit Run Compile Project Options Debug

Line 13 Col 14 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
printf("* ");
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:29 AM
22-Nov-24

A screenshot of a Windows operating system taskbar. It features a dark blue header bar with the Windows logo on the left and a search bar with the text "TC" in the center. Below the header is a row of pinned application icons, including File Explorer, Task View, Start, Taskbar settings, and several other icons for Microsoft Edge, File Explorer, File History, and others. The taskbar is located at the bottom of the screen.

```

for( r=1; r<=4; r++ )
{
    for( c=1; c<=r; c++ )
    {
        p( * );
    }
    p("\n");
}

```

$\frac{n}{4}$	$\frac{1}{1}$	$\frac{c=1 \text{ to } 1}{1 \text{ to } 1}$	$\frac{1}{1}$	*	
		$\frac{2}{2}$	$\frac{1 \text{ to } 2}{1 \text{ to } 2}$	$\frac{1}{1}$	$\frac{* *}{* *}$
		$\frac{3}{3}$	$\frac{1 \text{ to } 3}{1 \text{ to } 3}$	$\frac{1}{1}$	$\frac{* * *}{* * *}$
		$\frac{4}{4}$	$\frac{1 \text{ to } 4}{1 \text{ to } 4}$	$\frac{1}{1}$	$\frac{* * * *}{* * * *}$

The screenshot shows a Windows desktop environment with the Turbo C++ IDE open. The title bar of the IDE window displays "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", "Debug", "Line 9", "Col 20", "Insert", "Indent", "Tab", "Fill", "Unindent", and "* E". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,r,c;
    clrscr();
    printf("Enter no of rows ");
    scanf("%d",&n);
    for( r=n; r>=1; r-- )
    {
        for( c=1; c<=r; c++ )
        {
            printf("* ");
        }
        printf("\n");
    }
    getch();
}
```

The status bar at the bottom shows various icons for file operations like "File", "Help", "Zoom", "Switch", "Trace", "Stop", "Make", and "Run". The date and time "22-Nov-24" are also visible in the bottom right corner.

```
for(r=n; r>=1 ; r--  
{  
for( c=1; c<=r; c++  
{  
p( * );  
}  
p("\n");  
}
```

$$\frac{n}{4} \rightarrow \frac{r}{4} \quad \begin{matrix} c = 1 \text{ to } r \\ 1 \text{ to } 4 \end{matrix}$$

- - - *
- - - *
- - - *
- - - *

TC

File Edit Run Compile Project Options Debug

Line 13 Col 17 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,a=1;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
printf("%3d",a++);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:34 AM
22-Nov-24

```
TC
Enter no of rows 4
1
2 3
4 5 6
7 8 9 10
```



TC

File Edit Run Compile Project Options Debug

Line 13 Col 17 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,a;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n); a=n*(n+1)/2;
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
printf("%3d",a--);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:38 AM
22-Nov-24

```
TC
Enter no of rows 4
10
 9  8
 7  6  5
 4  3  2  1
```



```
TC
Enter no of rows 3
6
5 4
3 2 1
```



```
TC
Enter no of rows 10
55
54 53
52 51 50
49 48 47 46
45 44 43 42 41
40 39 38 37 36 35
34 33 32 31 30 29 28
27 26 25 24 23 22 21 20
19 18 17 16 15 14 13 12 11
10 9 8 7 6 5 4 3 2 1
```

```
int a=n * ( n+1 )/2;      n           n
for( r=1; r<=4; r++ )    a = 4 *(4+1)/2=10 a= 3 *(3+1)/2=6
{
for( c=1; c<=r; c++ )
{
p(a-- );
}
p("\n");
}
```

1 -	10
2 -	9 8
3 -	7 6 5
4 -	4 3 2 1

TC

File Edit Run Compile Project Options Debug

Line 13 Col 46 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
if((r+c)%2==0)printf("$ ");else printf("* ");
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >



9:43 AM
22-Nov-24

```
TC
Enter no of rows 10
$*
$ $ $ $
$ $ $ $ $
$ $ $ $ $ $
$ $ $ $ $ $ $
$ $ $ $ $ $ $ $
$ $ $ $ $ $ $ $ $
$ $ $ $ $ $ $ $ $ $
$ $ $ $ $ $ $ $ $ $
```

```
for( r=1; r<=4; r++ )  
{  
for( c=1; c<=r; c++ )  
{  
if(r+c)%2==0)p($);else p(*);  
}  
p("\n");  
}
```

4

\$ * \$
1+1=2
* \$ 2+2=4
\$ * \$
3+1=4 3+2=5 3+3=6
* \$ *

The screenshot shows a window titled "TC" representing the Turbo C++ IDE. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates "Line 14 Col 1 Insert Indent Tab Fill Unindent * E". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,r,c; char ch='A';
    clrscr();
    printf("Enter no of rows ");
    scanf("%d",&n);
    for( r=1; r<=n; r++ )
    {
        for( c=1; c<=r; c++ )
        {
            if(r==c||c==1||n==r)printf("%2c",'*');
            else printf("%2c",ch++);
        }
        printf("\n");
    }
    getch();
}
```

The status bar at the bottom displays various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and Run. The taskbar at the very bottom shows icons for Windows, File Explorer, Task View, DEV, Zoom, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer, Keyboard, Task View, and a battery icon. The system tray shows the date and time as 9:48 AM on 22-Nov-24.

```
TC
Enter no of rows 5
*
*
* A *
* B C *
* * * * *
```



The screenshot shows a Windows desktop environment. In the center is a terminal window titled 'TC' with a black background and white text. It displays the prompt 'Enter no of rows 5' followed by a series of asterisks and a single letter 'A'. Below the terminal is a standard Windows taskbar with a yellow-orange theme. On the taskbar, there are icons for the Start button, File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, OneDrive, Word, and File Explorer. To the right of the taskbar, the system tray shows the date and time as '9:48 AM 22-Nov-24'.

TC

```
File Edit Run Compile Project Options Debug
Line 15 Col 18 Insert Indent Tab Fill Unindent * E
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c; char ch='A';
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
if(r==c||c==1||n==r)printf("%2c",'*');
else printf("%2c",ch++);
if(ch>'Z')ch='A';
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



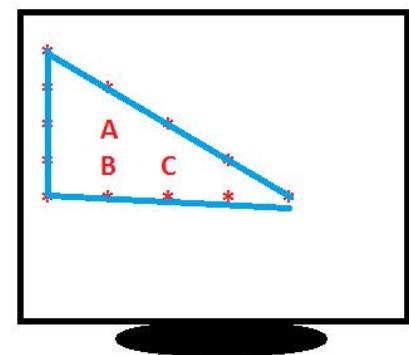
9:50 AM
22-Nov-24

TC

```
Enter no of rows 12
*
* *
* A *
* B C *
* D E F *
* G H I J *
* K L M N O *
* P Q R S T U *
* V W X Y Z A B *
* C D E F G H I J *
* K L M N O P Q R S *
* * * * * * * * * * *
```

ch = 'A';
for(r=1; r<=4; r++)
{
for(c=1; c<=r; c++)
{
if(c==1 || c==r || n==r)p(*); else p(ch++);
}
p("\n");
}

1
4



TC

File Edit Run Compile Project Options Debug

Line 15 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,e=2,o=1;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=r; c++ )
{
if(r%2==0){printf("%3d",e);e+=2;}
else {printf("%3d",o); o+=2;}
}
printf("\n");
}
getch();
}
```

Friday, 22 November, 2024



9:55 AM
22-Nov-24

```
TC
Enter no of rows 10
1
2 4
3 5 7
6 8 10 12
9 11 13 15 17
14 16 18 20 22 24
19 21 23 25 27 29 31
26 28 30 32 34 36 38 40
33 35 37 39 41 43 45 47 49
42 44 46 48 50 52 54 56 58 60
```

```
e=2; o=1;
for( r=1; r<=4; r++ )
{
    for( c=1; c<=r; c++ )
    {
        if(r%2==0) {p(e);e+=2;} else {p(o); o+=2;}
    }
    p("\n");
}
```

1
4

1
2 4
3 5 7
6 8 10 12

9:55 AM
22-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 14 Col 20 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,a=1,b;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{b=a+r-1;
for( c=1; c<=r; c++,a++)
{
if(r%2==0)printf("%3d",b--);
else printf("%3d",a);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:10 AM
22-Nov-24

```

TC
Enter no of rows 10
1
3 2
4 5 6
10 9 8 7
11 12 13 14 15
21 20 19 18 17 16
22 23 24 25 26 27 28
36 35 34 33 32 31 30 29
37 38 39 40 41 42 43 44 45
55 54 53 52 51 50 49 48 47 46

```

$\frac{n}{4}$ $\frac{\alpha++}{1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7}$

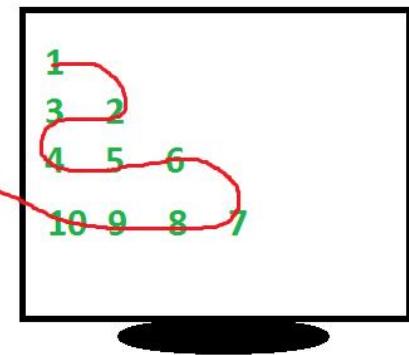
```

for( r=1; r<=4; r++ )
{
    for( c=1; c<=r; c++ )
    {
        }
    p("\n");
}

```

$$b = \frac{1}{2+2:4-1} = \begin{matrix} 1 \\ 3 \ 2 \\ 4 \ 5 \ 6 \end{matrix} \rightarrow \alpha$$

$$b = 4+7-1 = 10 \ 9 \ 8 \ 7$$



The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 12, Col 20. The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,r,c,a,b;
    clrscr();
    printf("Enter no of rows ");
    scanf("%d",&n);
    for( r=1; r<=n; r++ )
    {
        a=n-1; b=a+r;
        for( c=1; c<=r; c++ )
        {
            if(c==1)printf("%3d",r); else {printf("%3d",b);a--;b=b+a;}
        }
        printf("\n");
    }
    getch();
}
```

The taskbar at the bottom displays various application icons, including Windows, File Explorer, Task View, DEV, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as 10:33 AM, 22-Nov-24.

TC

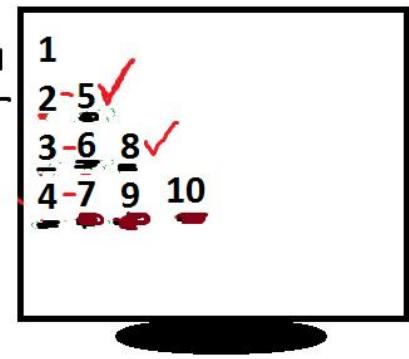
```
Enter no of rows 4
1
2 5
3 6 8
4 7 9 10
```

```

for( r=1; r<=4; r++)
{
    a=n-1; b=a+r;
    for( c=1; c<=r; c++)
    {
        if(c==1)p(r); else {p(b); a--; b=b+a;}
    }
    p("\n");
}
```

$$\begin{array}{r}
 \frac{n}{4} \quad \frac{a}{3} \quad \frac{b}{3+2=5} \\
 3 \quad 3+3=6+2=8 \\
 2 \quad 3+4=7+1=9 \\
 1 \quad 9+1=10
 \end{array}$$

$$\begin{array}{r}
 \frac{x}{4} + \frac{a}{3} = 7 \\
 2 + 7 = 9 \\
 1 + 9 = 10
 \end{array}$$



TC

File Edit Run Compile Project Options Debug

Line 14 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=n; c++)
{
if(c==r)printf("1 ");
else if(r>c)printf("2 ");
else printf("0 ");
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:38 AM
22-Nov-24

```
TC
Enter no of rows 10
1 0 0 0 0 0 0 0 0 0
2 1 0 0 0 0 0 0 0 0
2 2 1 0 0 0 0 0 0 0
2 2 2 1 0 0 0 0 0 0
2 2 2 2 1 0 0 0 0 0
2 2 2 2 2 1 0 0 0 0
2 2 2 2 2 2 1 0 0 0
2 2 2 2 2 2 2 1 0 0
2 2 2 2 2 2 2 2 1 0
2 2 2 2 2 2 2 2 2 1
```

```
for( r=1; r<=4; r++)
{
for( c=1; c<=r; c++ )
{
if(r==c)p(1);else if(r>c)p(2);else p(0);
}
p("\n");
}
```

1	0	0
1,1	1,2	1,3
2	1	0
2,1	2,2	2,3
2	2	1
3,1	3,2	3,3

TC

File Edit Run Compile Project Options Debug

Line 15 Col 44 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=n; c++)
{
if(c==r){textcolor(LIGHTRED);cprintf("1 ");}
else if(r>c){textcolor(YELLOW);cprintf("2 ");}
else {textcolor(LIGHTGREEN);cprintf("0 ");}
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:40 AM
22-Nov-24

```
TC
Enter no of rows 10
1 0 0 0 0 0 0 0 0 0
2 1 0 0 0 0 0 0 0 0
2 2 1 0 0 0 0 0 0 0
2 2 2 1 0 0 0 0 0 0
2 2 2 2 1 0 0 0 0 0
2 2 2 2 2 1 0 0 0 0
2 2 2 2 2 2 1 0 0 0
2 2 2 2 2 2 2 1 0 0
2 2 2 2 2 2 2 2 1 0
2 2 2 2 2 2 2 2 2 1
```

Windows Taskbar icons: File Explorer, File Manager, Task View, ZM, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, File Explorer. Date and time: 10:40 AM, 22-Nov-24.

TC

File Edit Run Compile Project Options Debug

Line 13 Col 40 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=n; c++)
{
if(c<=n-r)printf(" ");else printf("*");
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:47 AM
22-Nov-24

```
TC
Enter no of rows 10
*
**
***
****
*****
*****
*****
*****
*****
*****
*****
```

```
for( r=1; r<=4; r++)
{
    for( c=1; c<=4;c++)
    {
        if(c<=n-r)p(" ");
        else p(*);
    }
    p("\n");
}
```

TC

File Edit Run Compile Project Options Debug

Line 13 Col 38 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for( c=1; c<=n; c++)
{
if(c<=n-r)printf(" ");
else printf("* ");
}
printf("\n");
}
getch();
}
```

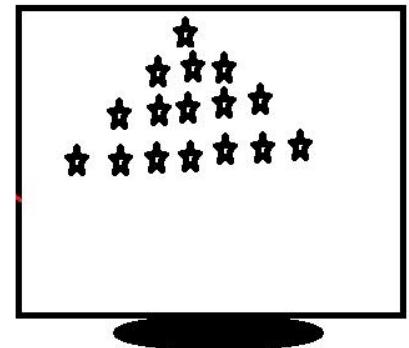
F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:56 AM
22-Nov-24

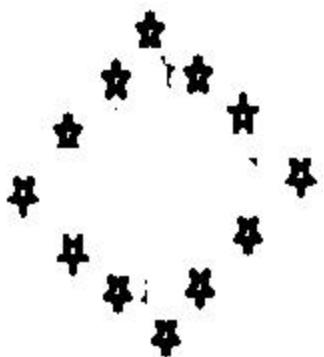
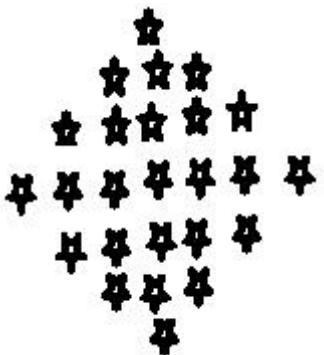
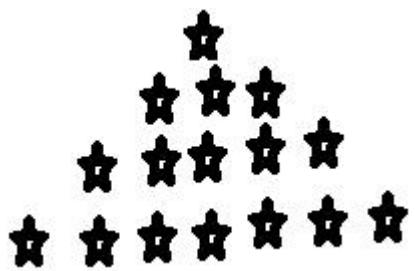
```
for( r=1; r<=4; r++)
{
    for( c=1; c<=4;c++)
    {
        if(c<=n-r)p(" ");
        else p(*);
    }
    p("\n");
}
```

$\frac{7}{4}$	$\frac{1}{1}$	$\frac{5}{5}$	$c=1$ to x	*
$4 - 1 =$	3		$1 - 1$	1
$4 - 2 =$	2		$1 - 2$	2
$4 - 3 =$	1		$1 - 3$	3
$4 - 4 =$	0		$1 - 4$	4



* - * - * - *

Home work:



TC

File Edit Run Compile Project Options Debug

Line 14 Col 12 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,s;
clrscr();

printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=r; c++)printf("**");
printf("\b \n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:30 AM
23-Nov-24

```
TC
Enter no of rows 5
*
 ***
 *****
 **** *****
 **** **** *
```



Without using \b:

TC

File Edit Run Compile Project Options Debug

Line 13 Col 34 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,s;
clrscr();

printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=2*r-1; c++)printf("*");
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:31 AM
23-Nov-24

```
Enter no of rows 10
*
 ***
 ****
 *****
 **** ****
 **** *****
 **** *****
 **** **** ****
 **** **** *****
 **** **** *****
 **** **** *****
 **** **** *****
 **** **** *****
 **** **** *****
```

```
for( r=1; r<=4; r++ )  
{  
    for(s=1;s<=n-r;s++) p(" ");  
  
    for(c=1;c<=r;c++)p("****");  
    p("    \n");  
}
```

$$\begin{array}{l} \underline{2^*r-1} \\ 2^*1-1=1 \\ 2^*2-1=3 \\ 2^*3-1=5 \\ 2^*4-1=7 \end{array}$$

$$\frac{n}{4} - \frac{8}{1} = \frac{5}{3}$$

$$4 - 2 = 2$$

$$4 - 3 = 1$$

$$4 - 4 = 0$$



TC

File Edit Run Compile Project Options Debug

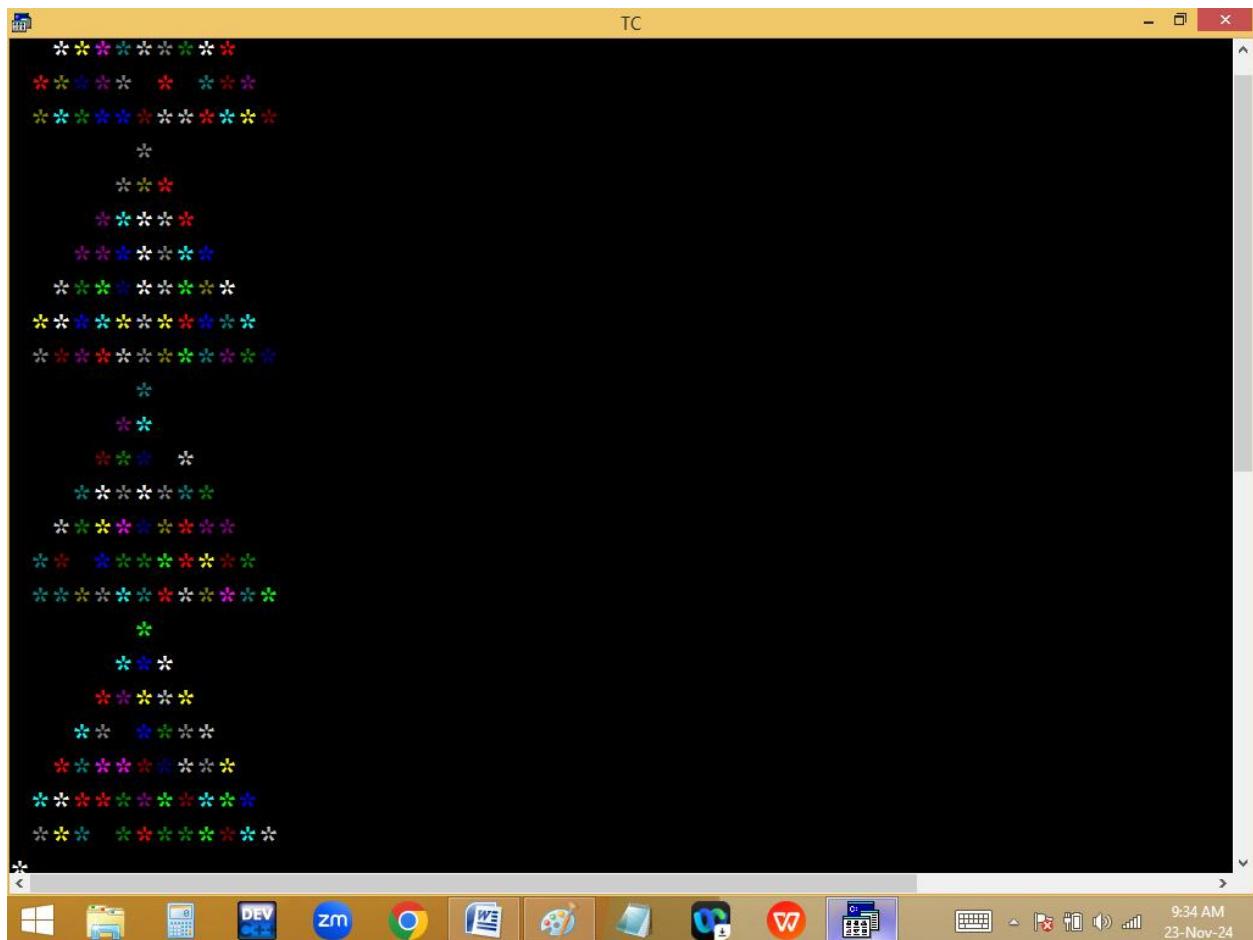
Line 8 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
while(!kbhit())
{
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)cprintf(" ");
for( c=1; c<=2*r-1; c++)
{
textcolor(random(16));cprintf("*");
}
printf("\n");
}
}
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:34 AM
23-Nov-24



TC

File Edit Run Compile Project Options Debug

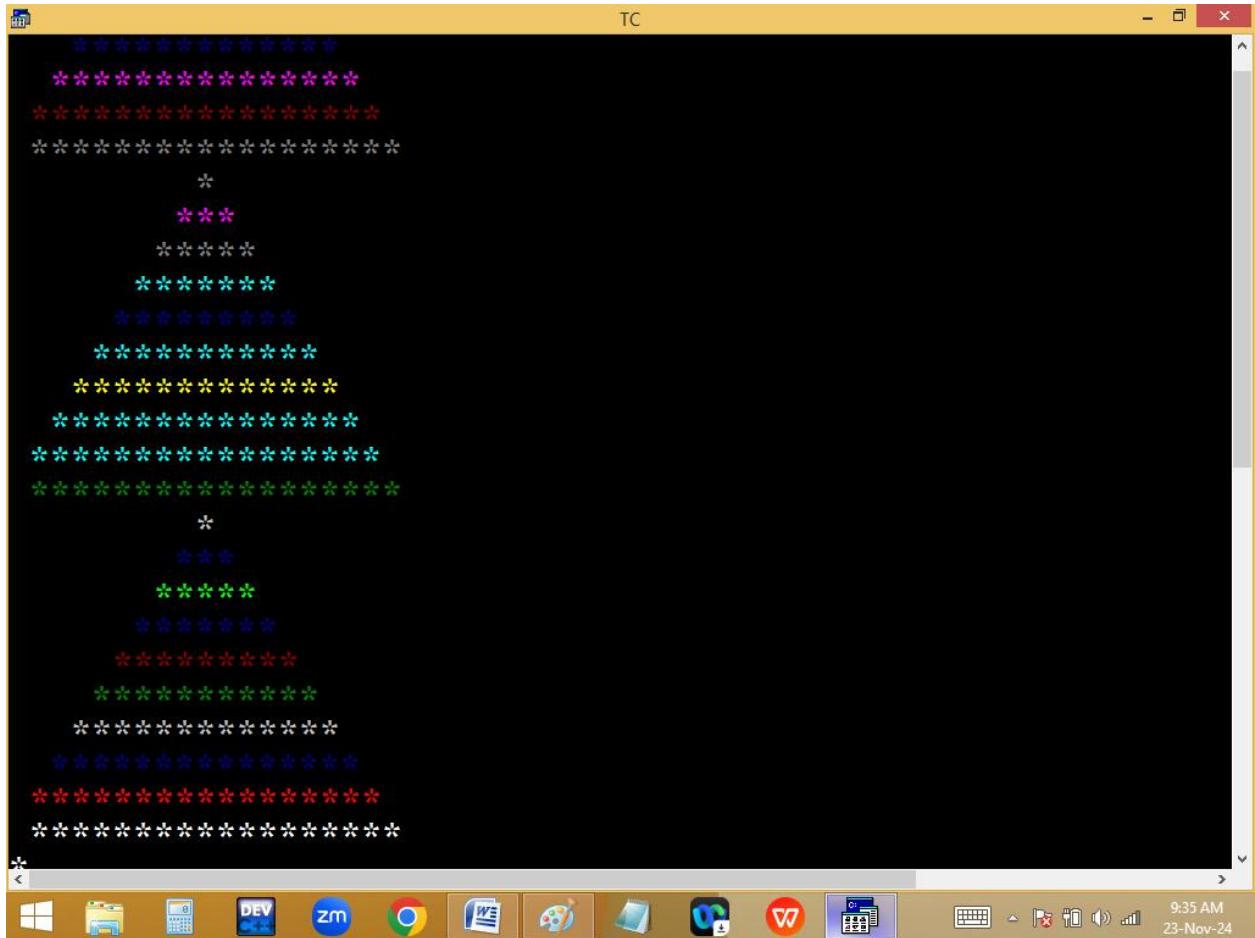
Line 14 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
while(!kbhit())
{
for( r=1; r<=n; r++ )
{
textcolor(random(16));
for(s=1;s<=n-r;s++)cprintf(" ");
for( c=1; c<=2*r-1; c++)cprintf("*");
printf("\n");
}
}
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:35 AM
23-Nov-24



TC

File Edit Run Compile Project Options Debug

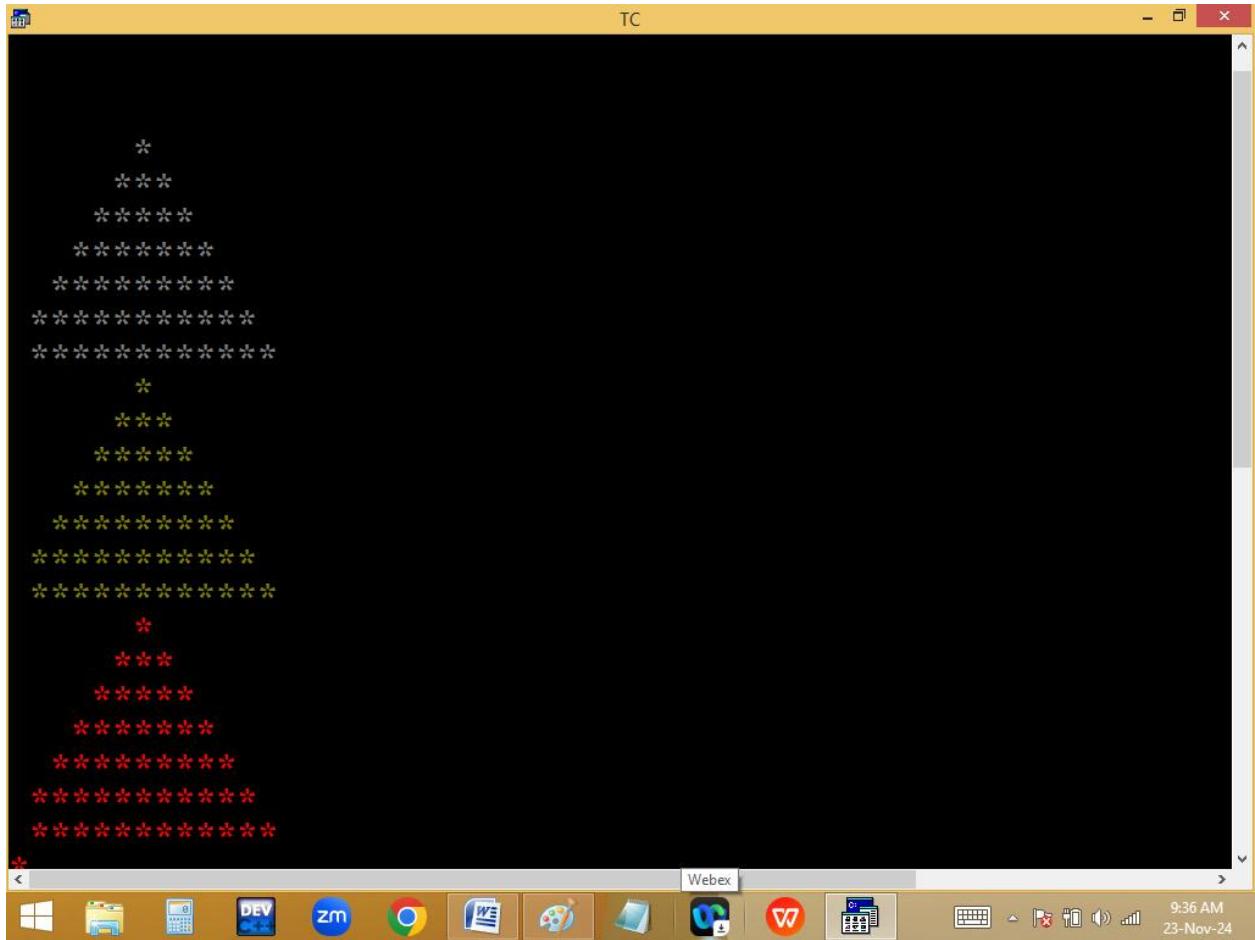
Line 15 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
while(!kbhit())
{
textcolor(random(16));
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)cprintf(" ");
for( c=1; c<=2*r-1; c++)cprintf("*");
printf("\n");
}
}
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:36 AM
23-Nov-24



TC

File Edit Run Compile Project Options Debug

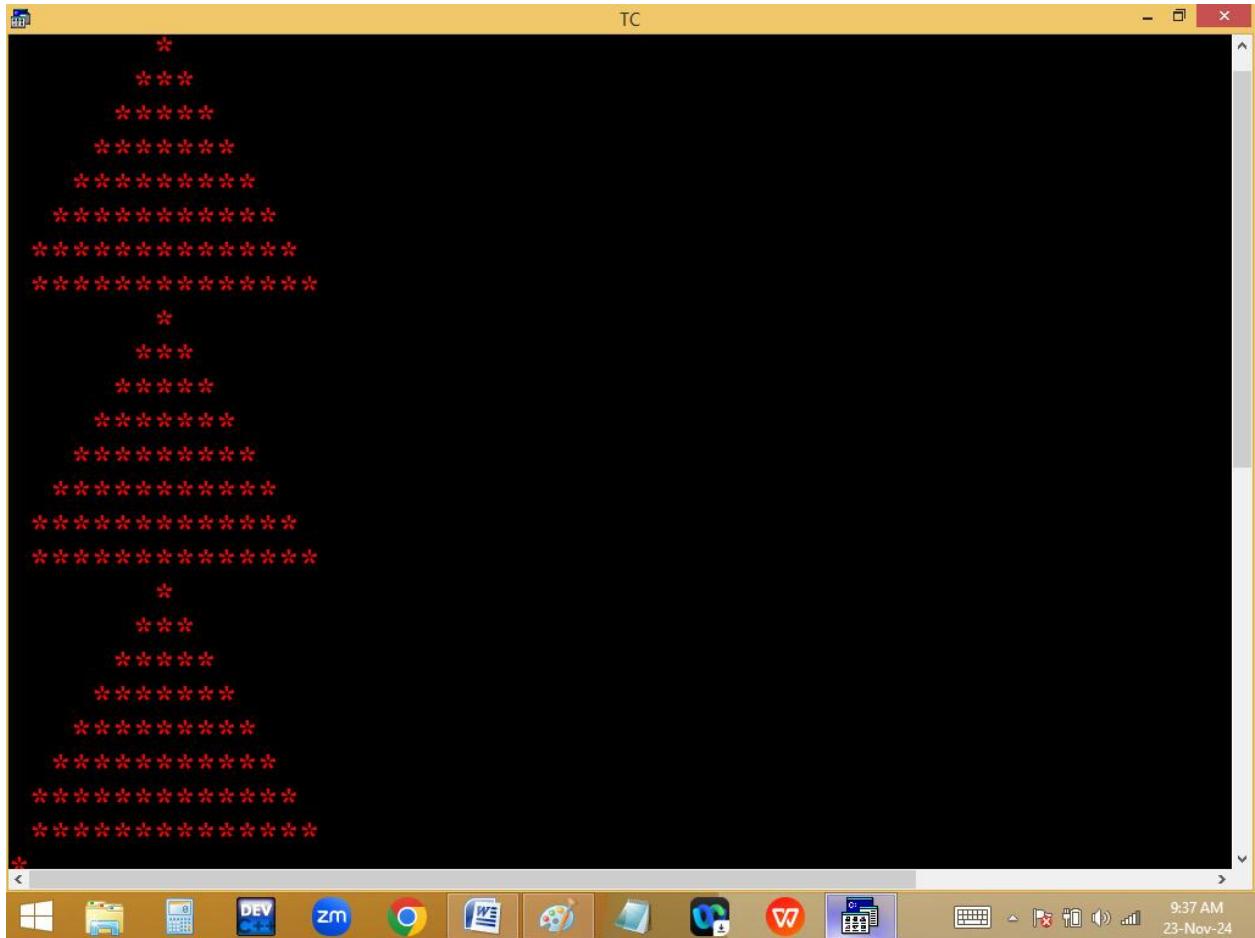
Line 12 Col 19 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
while(!kbhit())
{
textcolor(LIGHTRED);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)cprintf(" ");
for( c=1; c<=2*r-1; c++)cprintf("*");
printf("\n");
}
}
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:37 AM
23-Nov-24



TC

File Edit Run Compile Project Options Debug

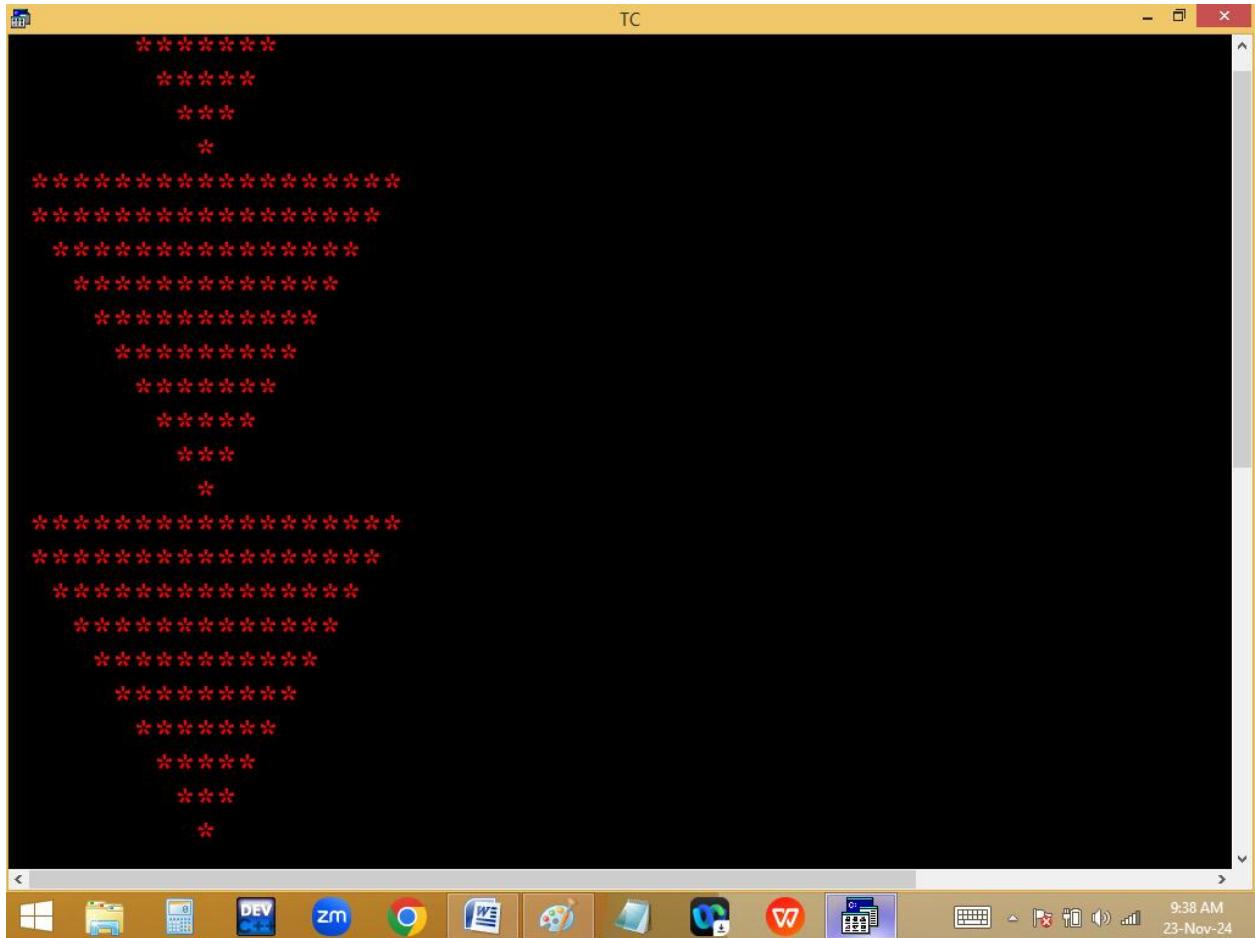
Line 13 Col 20 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;
clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
while(!kbhit())
{
textcolor(LIGHTRED);
for( r=n; r>=1; r-- )
{
for(s=1;s<=n-r;s++)cprintf(" ");
for( c=1; c<=2*r-1; c++)cprintf("*");
printf("\n");
}
}
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:38 AM
23-Nov-24



TC

Line 6 Col 13 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
int n,r,c,s;clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=2*r-1; c++)printf("*");
printf("\n");
}
for( r=n-1; r>=1; r-- )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=2*r-1; c++)printf("*");
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:40 AM
23-Nov-24

```
TC
Enter no of rows 5
*
 ***
 *****
 **** *****
 **** **** ****
 **** **** ****
 **** ****
 ****
 *
```

Windows Start button Taskbar 9:40 AM 23-Nov-24

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 1 Col 19 Insert Indent Tab Fill Unindent * E". The main code area contains the following C code:

```
#include<stdio.h> #include<conio.h>
void main()
{
int n,r,c,s;clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=2*r-1; c++)
if(c==1||c==r)printf("* ");else printf(" ");
printf("\n");
}
for( r=n-1; r>=1; r-- )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=2*r-1; c++)
if(c==1||c==r)printf("* ");else printf(" ");
printf("\n");
}
getch();
}
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and Run. On the far right of the status bar, it displays the time "9:42 AM" and date "23-Nov-24".

```
TC
Enter no of rows 5
*
 *
* *
* * *
*   *
*   *
*   *
*   *
*   *
*   *
```

Windows Taskbar icons: File Explorer, File Manager, Task View, ZM, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer. Date and time: 9:42 AM, 23-Nov-24.

TC

File Edit Run Compile Project Options Debug

Line 12 Col 32 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,r,c,s;clrscr();
printf("Enter no of rows ");
scanf("%d",&n);
for( r=1; r<=n; r++ )
{
for(s=1;s<=n-r;s++)printf(" ");
for( c=1; c<=r; c++)printf("%2d",c);
for( c=r-1; c>=1;c--)printf("%2d",c);
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



9:48 AM
23-Nov-24

```
TC
Enter no of rows 12
      1
     1 2 1
    1 2 3 2 1
   1 2 3 4 3 2 1
  1 2 3 4 5 4 3 2 1
 1 2 3 4 5 6 5 4 3 2 1
1 2 3 4 5 6 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 10 9 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 10 11 10 9 8 7 6 5 4 3 2 1
1 2 3 4 5 6 7 8 9 10 11 12 11 10 9 8 7 6 5 4 3 2 1
```

PASCAL TRIANGLE:

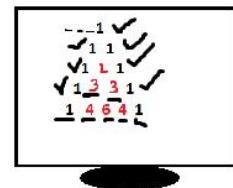
The screenshot shows a window titled "TC" (Turbo C++) with a menu bar including File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates "Line 14 Col 12". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,r,c,s,a;clrscr();
    printf("Enter no of rows ");
    scanf("%d",&n);
    for( r=0; r<n; r++ )
    {
        for(s=1;s<n-r;s++)printf("   ");
        for(c=0; c<=r; c++)
        {
            if(c==0||c==r)a=1;else a=a*(r-c+1)/c;
            printf("%4d",a);
        }
        printf("\n");
    }
    getch();
}
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and a date/time stamp of "10:04 AM 23-Nov-24".

```
TC
Enter no of rows 10
      1
      1 1 1
      1 2 1
      1 3 3 1
      1 4 6 4 1
      1 5 10 10 5 1
      1 6 15 20 15 6 1
      1 7 21 35 35 21 7 1
      1 8 28 56 70 56 28 8 1
      1 9 36 84 126 126 84 36 9 1
      1
```

for(r=0; r<n; r++)	$\frac{n}{4}$	Σ	$\frac{C}{D}$	$\frac{a}{b}$
{	0	0	0	1
for(s=1; s<=n-r; s++) p(" ");	1	0	1	1
for(c=0; c<r; c++)	2	0/2	1	$(2-1+1)/1=2$
{	3	0/23	1	$(3-1+1)/1=3$
if(c==0 c==r) a=1; ✓	4	0/234	1	$3*(3-2+1)/2=3$
else a=a*(r-c+1)/c;				$*(4-1+1)/1=4$
p(a); ✓				$4*(4-2+1)/2=6$
}				
p("\n");				$6*(4-3+1)/3=4$
}				



Interview questions:

TC

File Edit Run Compile Project Options Debug

Error: Expression syntax in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
while( )
{
printf("%3d",a++);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >



10:05 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 7 Col 13 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
while("false")
{
printf("%d\t",a++);
}
getch();
}
/* 1 to 1 infinite */
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



10:07 AM
23-Nov-24

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window shows "Line 13 Col 16 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
while("abc">"ab")
{
printf("%d\t",a++);
}
getch();
/* Blank screen_*/
```

The taskbar at the bottom of the screen displays several icons for various applications, including File Explorer, Control Panel, Task View, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, File Explorer, Word, File Explorer, and Task View. The system tray shows the date and time as "10:10 AM 23-Nov-24".

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the Turbo C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window shows "Line 10 Col 16 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
while(a++)
{
printf("%d\t",a);
}
getch();
/* Blank screen */
```

The taskbar at the bottom of the screen displays several icons for various applications, including File Explorer, Control Panel, Task View, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, File Explorer, Word, File Explorer, and Task View. The system tray shows the date and time as "10:11 AM 23-Nov-24".

A screenshot of a Windows desktop environment. In the center is a terminal window titled "TC" with a dark blue background. The window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
while(++a)
{
printf("%d\t",a);
}
getch();
/* 1 2 3 ... 32767 -32768 -32767 .... -1_ */
```

The terminal output shows the numbers 1 through 32767 followed by -32768, -32767, and so on, indicating a loop that has wrapped around from the maximum value of an integer to the minimum. The status bar at the bottom of the terminal window shows "Line 13 Col 41".

Below the terminal window is a taskbar with several icons, including the Start button, File Explorer, Task View, Task Manager, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as "10:12 AM 23-Nov-24".

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar shows Line 13, Col 5, Insert, Indent, Tab, Fill, Unindent, and E. The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(++a);
    {
        printf("%d\t",a);
    }
    getch();
}
/* 0 */
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and a date/time stamp of 10:14 AM, 23-Nov-24.

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top shows "Line 13 Col 5". The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a++);
    {
        printf("%d\t",a);
    }
    getch();
}
/* 1_ */
```

The status bar at the bottom shows various icons for system functions like Help, Zoom, Switch, Trace, Stop, Make, and a date/time stamp of "10:15 AM 23-Nov-24".

TC

File Edit Run Compile Project Options Debug Edit

Line 7 Col 25 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(1);
    {
        printf("%d\t",a++);
    }
    getch();
}
/* infinite blank screen */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Task Manager, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View. Date and time: 10:17 AM 23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 4 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(++a);
    switch(a)
    {
        printf("%d\t", ++a);
    }
    getch();
}
/* blank screen */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:19 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 11 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(++a)
    {
        if(a<5)printf("%d\t",a);
        else break;
    }
    getch();
}
/* 1 2 3 4 */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:21 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 7 Col 21 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a<=5)
    {
        printf("%d\t",a);
    }
    getch();
}
/* 0 infinite times */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, File Explorer, Keyboard, Task View, Volume, Network, Date/Time: 10:22 AM, 23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 17 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a<=5)
    {
        printf("%d\t",a++);
        printf("%d",++a);
        getch();
    }
/* 0 1 2 3 4 5 7 */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View. Date and time: 10:24 AM 23-Nov-24

Line 14 Col 8 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a++<=5);
    {
        printf("%d\t",a);
    }
    printf("%d",++a);
    getch();
}
/* 7 8 */
```

— Watch —

The screenshot shows a Windows operating system interface. At the top is the Turbo C (TC) IDE window with a yellow title bar containing the menu bar: File, Edit, Run, Compile, Project, Options, Debug, and Edit. The main area of the window displays a C program. Below the menu bar, there is a status bar showing "Line 14 Col 8 Insert Indent Tab Fill Unindent *". The code itself includes #include directives for stdio.h and conio.h, a main function with a while loop that prints numbers from 1 to 5 followed by a tab, and a final printf statement before getch(). A multi-line comment /* 7 8 */ is at the bottom. The window has standard Windows window controls (minimize, maximize, close) in the top right corner. At the bottom of the screen is the Windows taskbar, which contains icons for various applications like File Explorer, Control Panel, and several pinned icons. To the right of the taskbar, the system tray shows the date and time as "10:26 AM 23-Nov-24".

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 15 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a++<=5)
    {
        printf("%d\t",a);
    }
    printf("%d",++a);
    getch();
}
/* 1 2 3 4 5 6 8 */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, File Explorer, Keyboard, Task View, 10:28 AM, 23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 15 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(++a<=5)
    {
        printf("%d\t",a);
    }
    printf("%d",++a);
    getch();
}
/* 1 2 3 4 5 7 */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:29 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

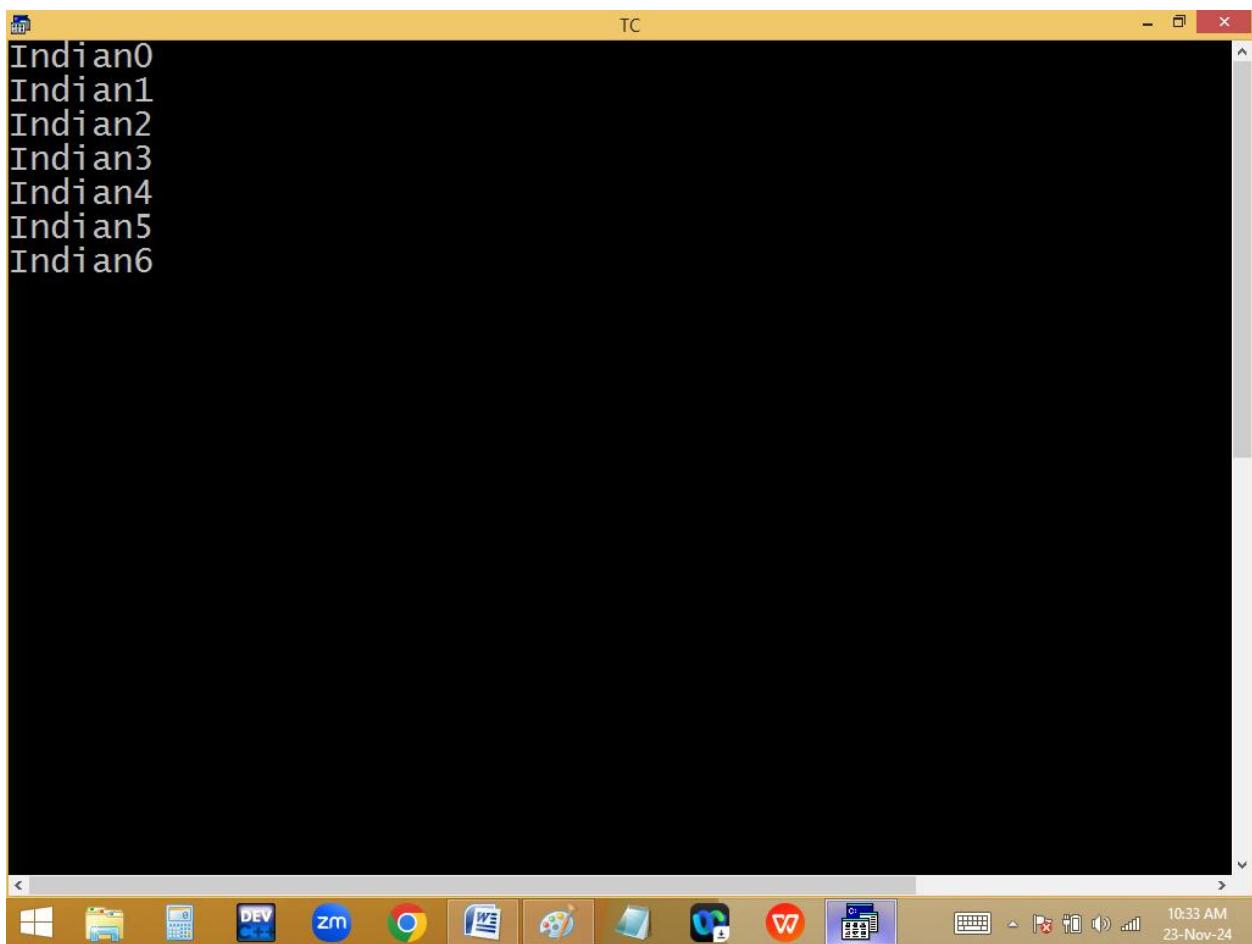
Line 14 Col 1 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while_printf("Indian")-a)
    {
        printf("%d\n",a++);
    }
    printf("%d",a);
    getch();
}
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View. Date and time: 10:33 AM 23-Nov-24



TC

File Edit Run Compile Project Options Debug Edit

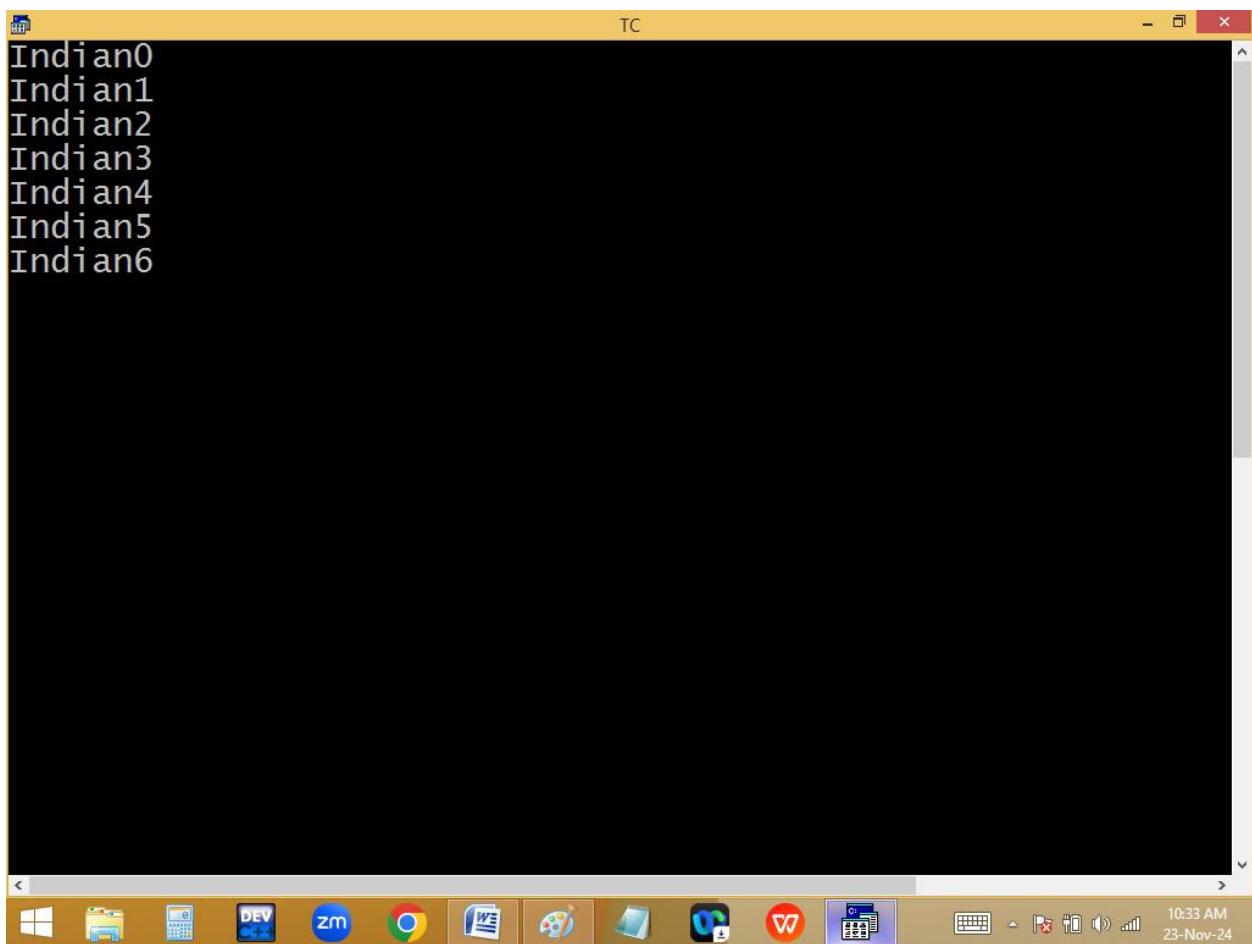
Line 7 Col 8 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while(a<=printf("Indian"))
    {
        printf("%d\n",a++);
    }
    printf("%d",a);
    getch();
}
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, File Explorer. Date and time: 10:33 AM 23-Nov-24



TC

File Edit Run Compile Project Options Debug Edit

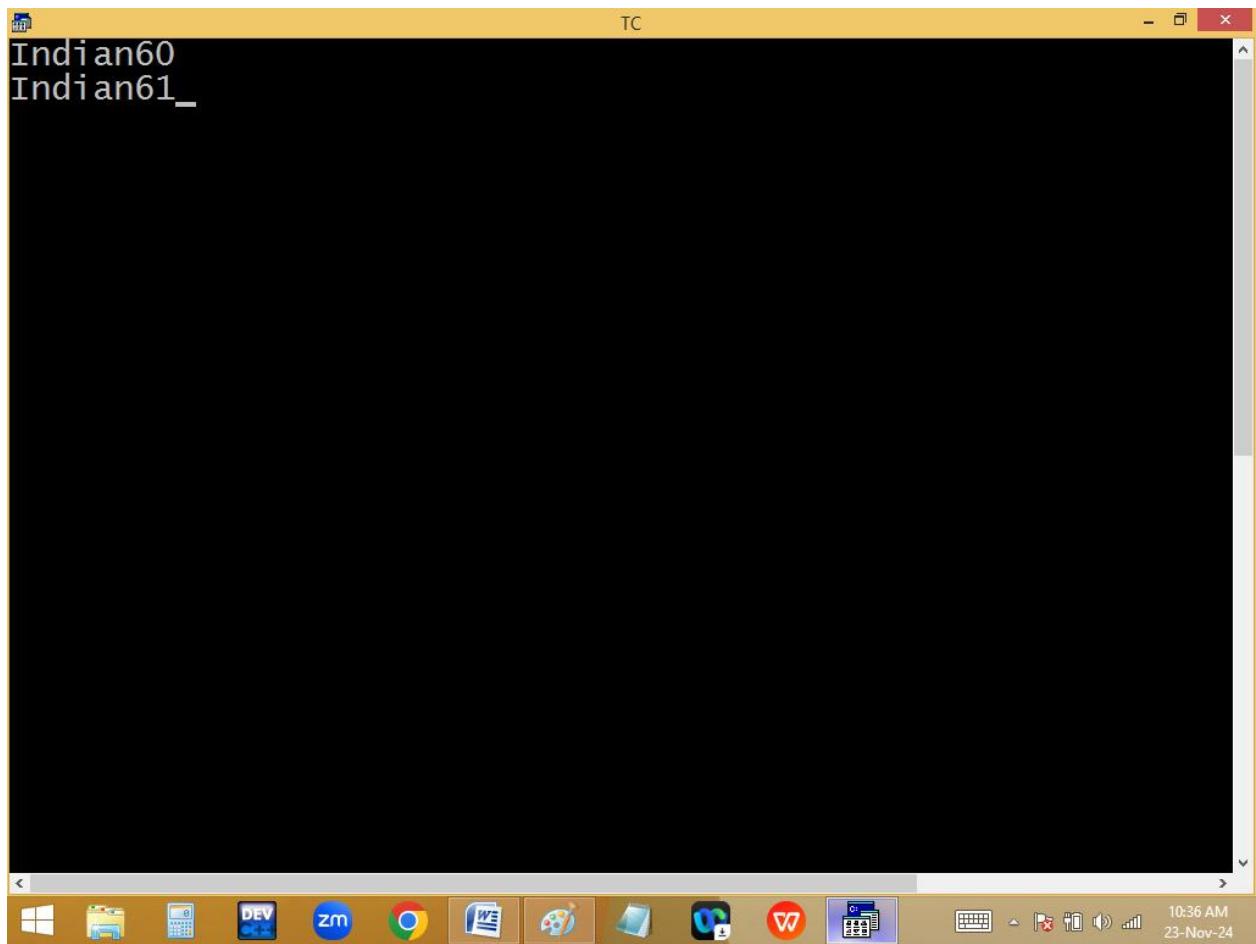
Line 7 Col 35 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    while_printf("%d",printf("Indian"))-a)
    {
        printf("%d\n",a++);
    }
    printf("%d",a);
    getch();
}
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View. Date and time: 10:36 AM 23-Nov-24



TC

File Edit Run Compile Project Options Debug Edit

Error: For statement missing ; in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    for( ; a++)
    {
        printf("%d\n",a);
    }
    getch();
}
```

Message

Compiling E:\TC\9AM.C:

- Error E:\TC\9AM.C 7: For statement missing ; in function m
- Warning E:\TC\9AM.C 12: 'a' is assigned a value which is n

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >

Windows Start File Explorer Control Panel ZM Google Chrome File Explorer Paint Notepad Word Calendar Keyboard 10:37 AM 23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 1 Col 22 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=0;
    clrscr();
    for( ; ; a++)
    {
        printf("%d\t",a);
    }
    getch();
}

/* 0 to 0 infinite */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >



10:39 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 13 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0;
clrscr();
for(a++;a<=10 ; a++)
{
printf("%d\t",a++);
}
getch();
}

/* 1 3 5 7 9_ */
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



10:40 AM
23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 16 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0,b=100;
clrscr();
for( ;a<=2 , b<=13 ; a++,b++)
{
printf("%d\t%d\n",a,b);
}
getch();
}

/* Blank screen_*/
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar: File Explorer, Task View, Task Manager, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View, Keyboard, Task View, 10:42 AM, 23-Nov-24

TC

File Edit Run Compile Project Options Debug Edit

Line 14 Col 1 Insert Indent Tab Fill Unindent *

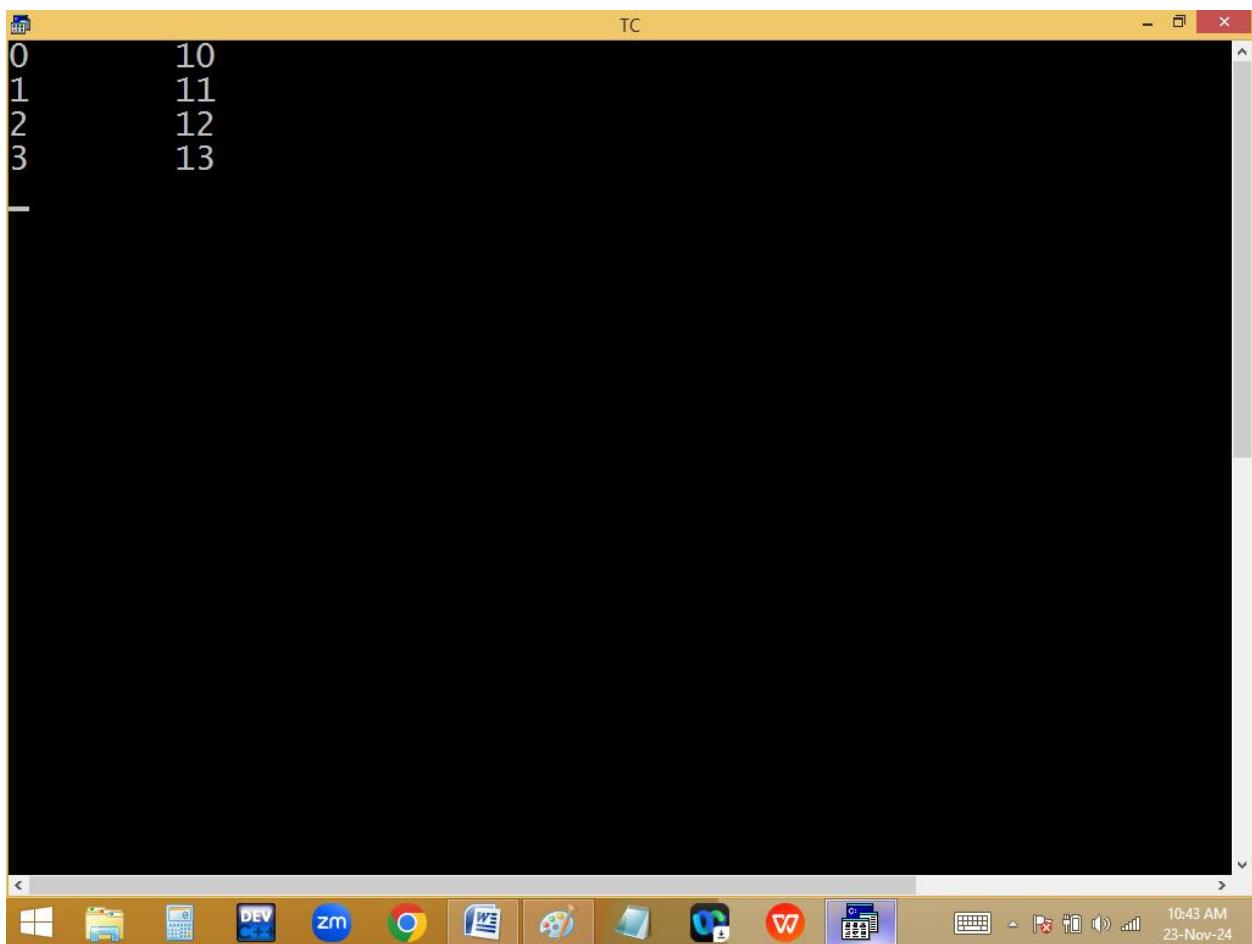
```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0,b=10;
clrscr();
for( ;a<=2 , b<=13 ; a++,b++)
{
printf("%d\t%d\n",a,b);
}
getch();
}
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer.

System tray: 10:43 AM, 23-Nov-24



TC

File Edit Run Compile Project Options Debug Edit

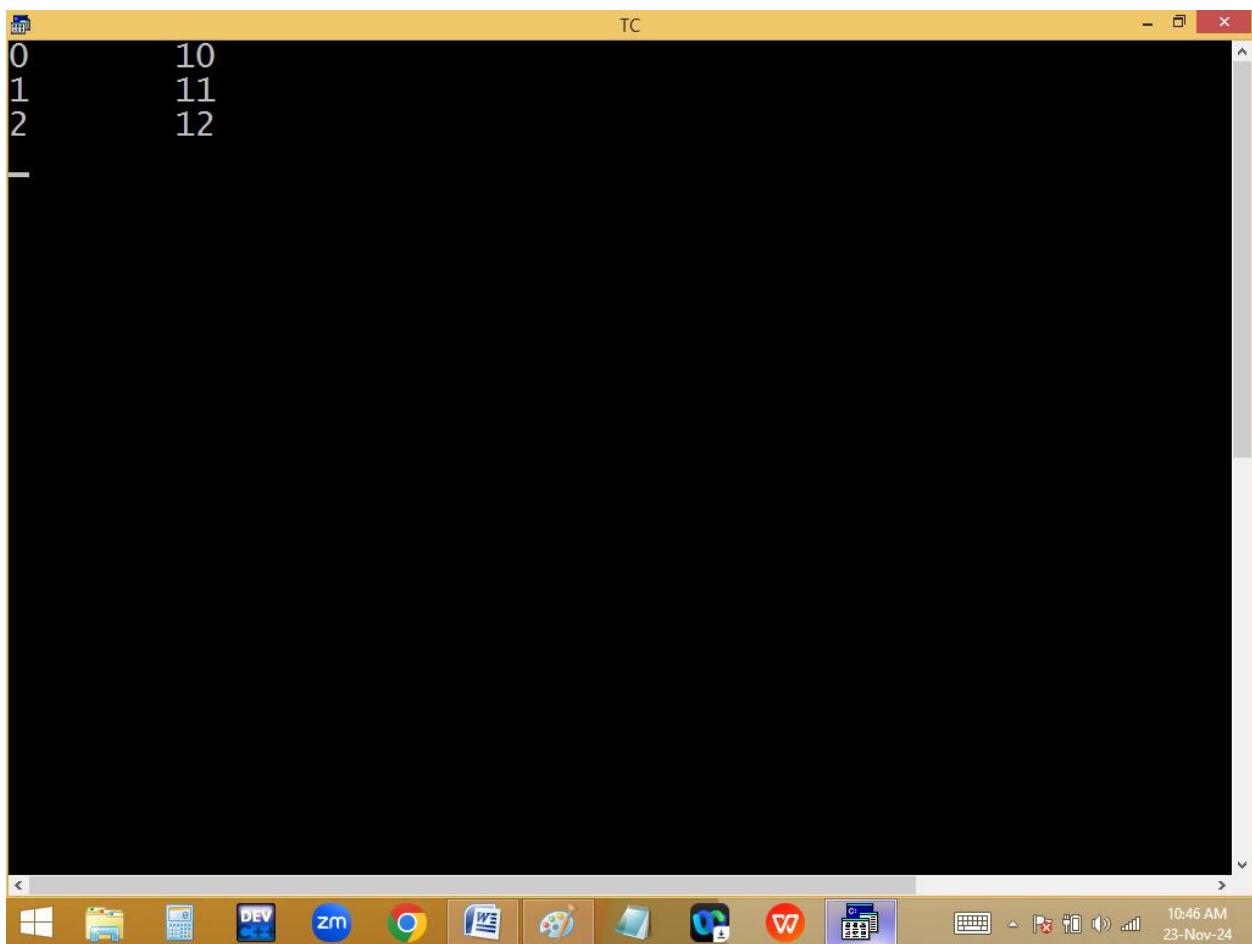
Line 7 Col 18 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=0,b=10;
clrscr();
for( ; b<=13, a<=2 ; a++,b++)
{
printf("%d\t%d\n",a,b);
}
getch();
}
```

Watch

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows Taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Word, Task View. Date and time: 10:46 AM 23-Nov-24



TC

File Edit Run Compile Project Options Debug

Line 7 Col 54 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=1;
clrscr();
for( ; printf("Enter a no ") -a ; printf("a=%d\n",a))_
{
scanf("%d",&a);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:25 AM
25-Nov-24

```
TC
Enter a no 2
a=2
Enter a no 9
a=9
Enter a no 0
a=0
Enter a no 11
a=11
Enter a no _
```



A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window shows "Line 9 Col 23 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=1;
clrscr();
for( ; a ; printf("a=%d\n",a))
{
printf("Enter a no ");
scanf("%d",&a);
}
getch();
}
```

The taskbar at the bottom of the screen displays various application icons, including Windows Explorer, File Explorer, Task View, DEV, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as 9:26 AM on 25-Nov-24.

```
TC
Enter a no 4
a=4
Enter a no 1
a=1
Enter a no -3
a=-3
Enter a no 0
a=0
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying a series of user inputs and corresponding outputs. The inputs are 'Enter a no 4', 'Enter a no 1', 'Enter a no -3', and 'Enter a no 0'. The outputs are 'a=4', 'a=1', 'a=-3', and 'a=0' respectively. Below the terminal window is a standard Windows taskbar. On the taskbar, there are several pinned icons: File Explorer, File History, Task View, Microsoft Edge (Dev), Zoom (zm), Google Chrome, File Explorer (WE), Paint, File Explorer (F), Microsoft Word (W), and Microsoft Outlook. To the right of the taskbar, the system tray displays the date and time as '9:26 AM 25-Nov-24'.

A screenshot of a Microsoft Windows desktop environment. At the top is the taskbar with various pinned icons. Below the taskbar is the system tray showing the date and time (9:29 AM, 25-Nov-24). The main focus is a code editor window titled "TC" (Turbo C++). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the editor window shows "Line 9 Col 1 Insert Indent Tab Fill Unindent * E". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100;
clrscr();
for( ; a > printf("Enter a no ") ; printf("a=%d\n",a))
{
scanf("%d",&a);
}
getch();
}
```

```
TC
Enter a no 23
a=23
Enter a no 12
a=12
Enter a no 4
a=4
Enter a no _
```

TC

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()
{
int a=100;
clrscr();
for(printf("Enter a no ");scanf("%d",&a);printf("Enter a no"))
{
printf("a=%d\n",a);
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Menu NUM

```
Enter a no 1
a=1
Enter a no2
a=2
Enter a no3
a=3
Enter a no0
a=0
Enter a no-1
a=-1
Enter a no
```

Infinite times reading and printing the value

TC

File Edit Run Compile Project Options Debug

Line 11 Col 20 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=5;
clrscr();
for(;a++)
{
printf("Enter a no ");
a = scanf("%d",&a);
printf("a=%d\n",a);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >



9:36 AM
25-Nov-24

```
TC
Enter a no 9
a=1
Enter a no -4
a=1
Enter a no 0
a=1
Enter a no 1
a=1
Enter a no
```

A screenshot of a Windows desktop environment. A terminal window titled 'TC' is open, displaying a series of text entries and responses. Below the terminal is a standard Windows taskbar with a row of icons for common applications like File Explorer, Edge, and Paint. The taskbar also shows the date and time as '9:36 AM 25-Nov-24'.

Windows taskbar icons include: Start button, File Explorer, Edge browser, Task View, ZM, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer. System status icons show signal strength, battery level, and volume.

break:

TC

File Edit Run Compile Project Options Debug

Error: Misplaced break in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
clrscr();
puts("Good morning");
break;
puts("Good night");
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >

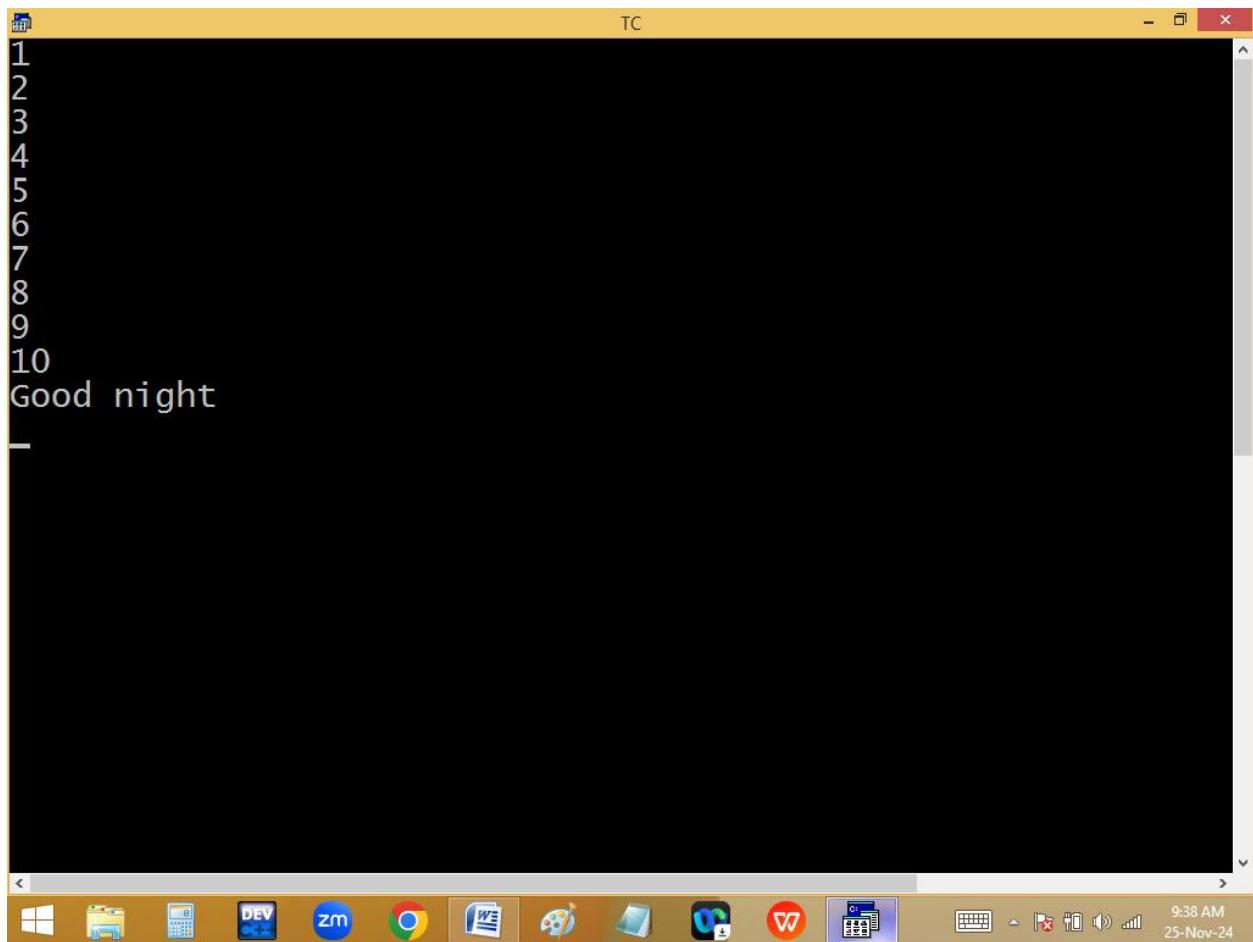
Windows File Explorer Task View DEV zm Google File Explorer Paint Notepad Word Calendar 9:37 AM 25-Nov-24

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. Below the menu is a status bar showing "Line 11 Col 7". The main code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=1;i<=10;i++)
{
printf("%d\n",i);
}
puts("Good night");
getch();
}
```

The taskbar at the bottom shows several pinned icons: Start, File Explorer, Task View, Task Switcher, Zoom, Switch, Trace, Stop, Make, and a folder icon. To the right of the taskbar are the system tray icons for battery, signal strength, volume, and date/time (9:38 AM, 25-Nov-24).

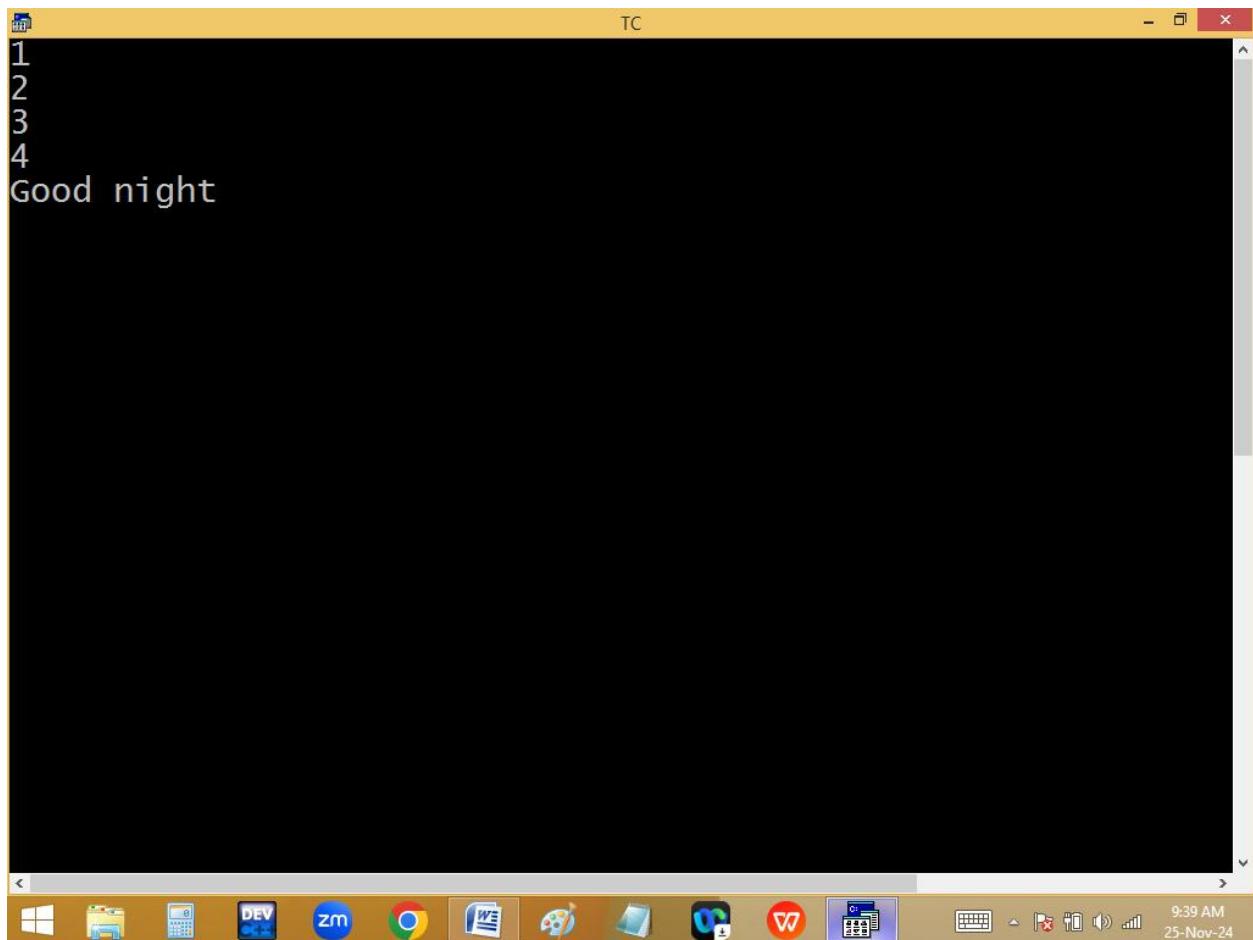
```
1  
2  
3  
4  
5  
6  
7  
8  
9  
10 Good night
```

A screenshot of a Windows operating system desktop. At the top is a yellow taskbar with several pinned icons: File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, OneDrive, Word, and File Explorer. To the right of the taskbar are the system clock (9:38 AM) and date (25-Nov-24). Below the taskbar is a black terminal window titled 'TC'. The terminal contains the following text:
1
2
3
4
5
6
7
8
9
10 Good night
The terminal has a vertical scroll bar on the right side.

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top shows "Line 13 Col 15 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i;
    clrscr();
    for(i=1;i<=10;i++)
    {
        if(i==5)break;
        printf("%d\n",i);
    }
    puts("Good night");
    getch();
}
```

The taskbar at the bottom shows various application icons, including Windows, File Explorer, Task View, DEV, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as 9:39 AM on 25-Nov-24.



TC

File Edit Run Compile Project Options Debug

Error: Misplaced break in function show

```
#include<stdio.h>
#include<conio.h>
void show()
{
    puts("Good afternoon");
    break;
    puts("Good evening");
}
void main()
{
    clrscr();
    puts("Good morning");
    show();
    puts("Good night");
    getch();
}
```

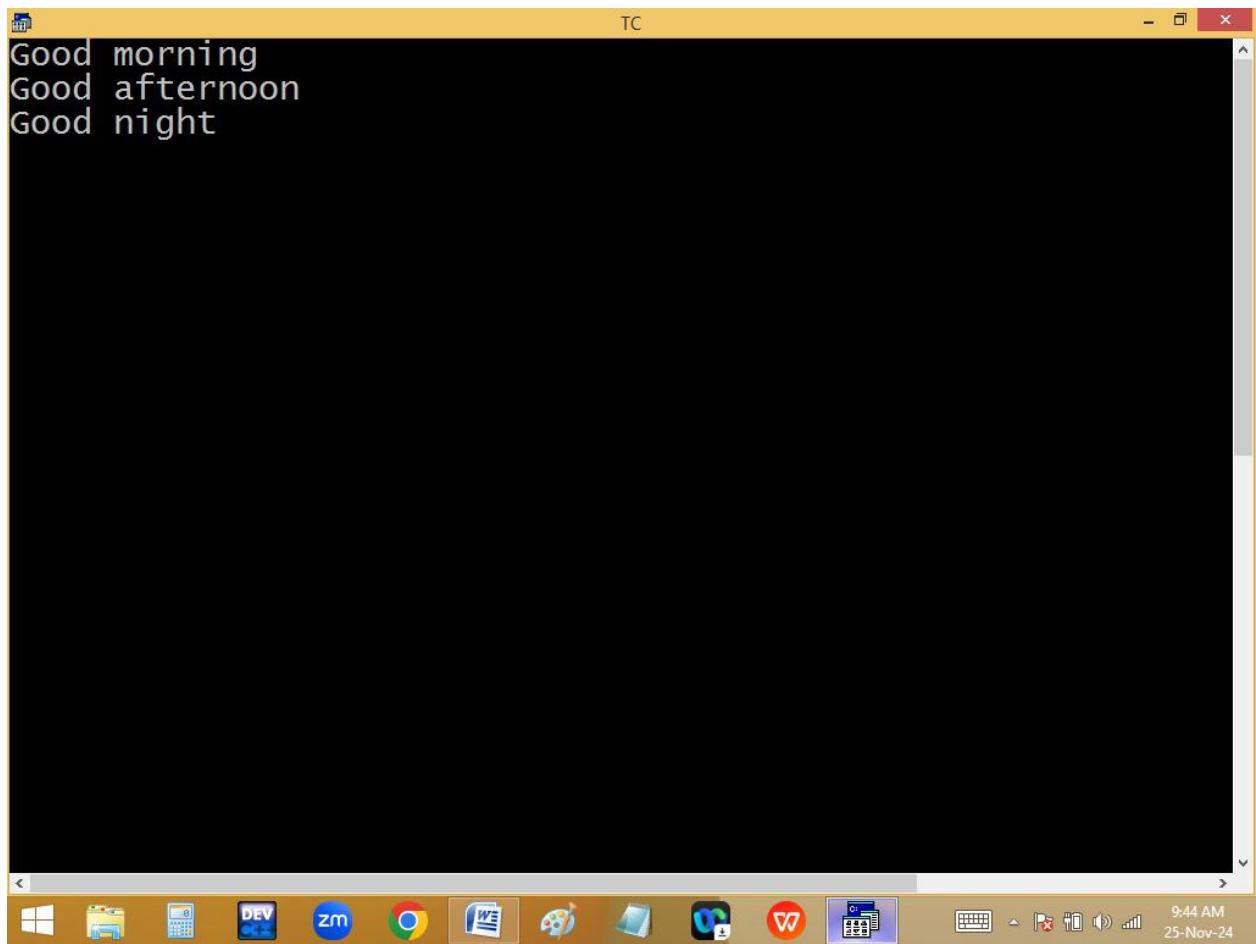
F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F1 >

Windows File Explorer Task View DEV zm Google Sheets Paint Notepad Word Calendar 9:41 AM 25-Nov-24

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 6 Col 6 Insert Indent Tab Fill Unindent * E". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void show()
{
    puts("Good afternoon");
    return;
    puts("Good evening");
}
void main()
{
    clrscr();
    puts("Good morning");
    show();
    puts("Good night");
    getch();
}
```

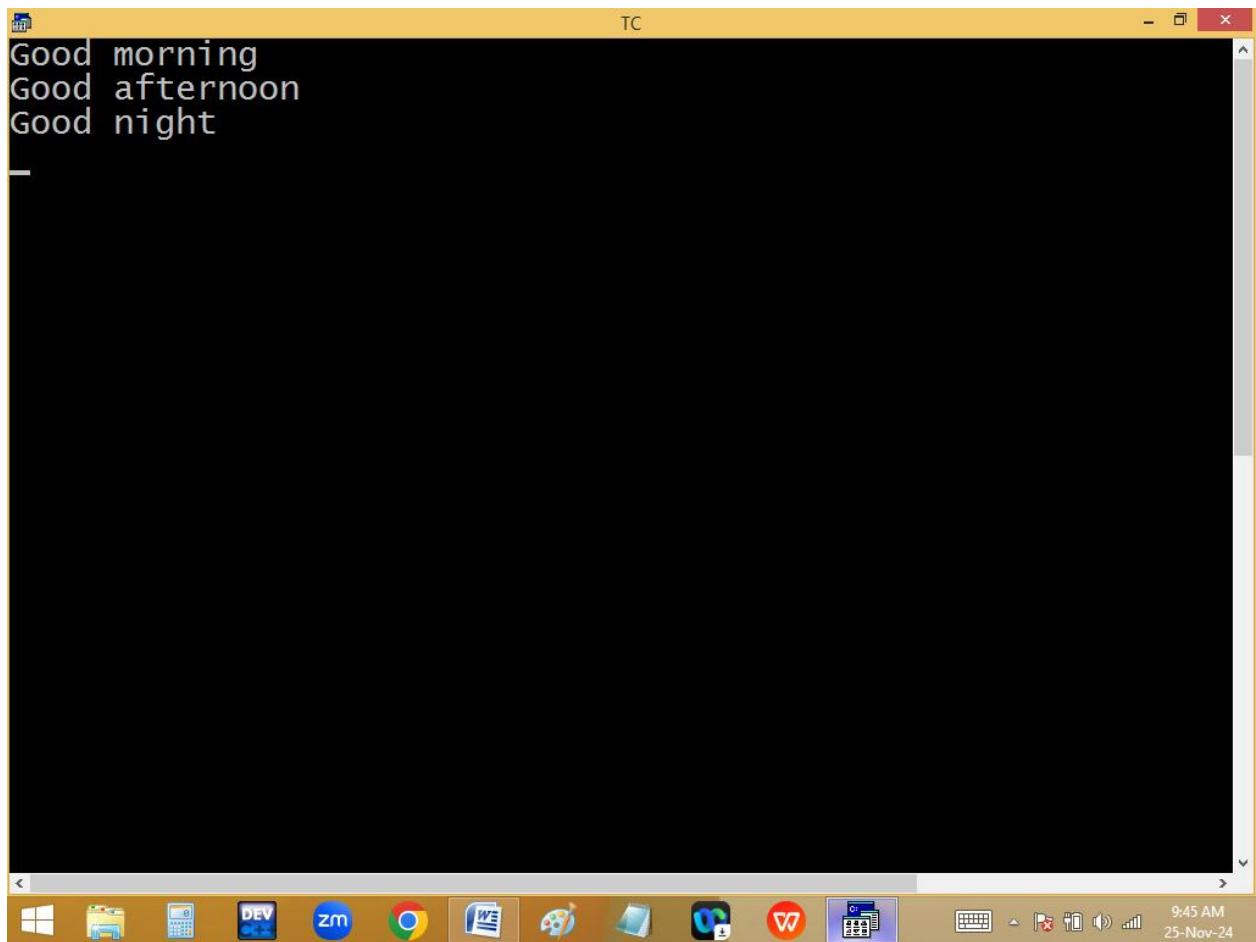
The taskbar at the bottom shows various pinned icons, including File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, File Explorer, Word, File Explorer, and Task View again. The system tray shows the date and time as "9:44 AM 25-Nov-24".



A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 6 Col 9 Insert Indent Tab Fill Unindent * E". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
int show()
{
    puts("Good afternoon");
    return 1;
    puts("Good evening");
}
void main()
{
    clrscr();
    puts("Good morning");
    show();
    puts("Good night");
    getch();
}
```

The taskbar at the bottom shows various pinned icons, including File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer, and Task View again. The system tray shows the date and time as "9:45 AM 25-Nov-24".



A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 3 Col 39 Insert Indent Tab Fill Unindent * E". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h> /* <process.h> */
void show()
{
    puts("Good afternoon");
    exit(0);
    puts("Good evening");
}
void main()
{
    clrscr();
    puts("Good morning");
    show();
    puts("Good night");
    getch();
}
```

The taskbar at the bottom shows several pinned icons: File Explorer, Task View, Calculator, DEV, Zoom, zm, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer, and Task View. The system tray shows the date and time as "9:47 AM 25-Nov-24".

The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. Below it is a terminal window titled 'TC' with a black background. The window displays the text 'Good morning' and 'Good afternoon' on separate lines. The desktop background is visible behind the terminal window.

break	exit()	Return
Keyword	Function	Keyword
Header file not required	stdlib.h / process.h required	Header file not required
Terminates switch / loop	Terminates total program	Closes that function only
Should be used within switch/loop	Used any where	Used any where

continue: It is a keyword using within loop only. When continue occurred the remaining statements in that loop are skipped and program jumped to loop ending and later to the beginning.

TC

File Edit Run Compile Project Options Debug

Error: Misplaced continue in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
if(i%2==0) continue;
i++;
printf("%d\n",i);
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >

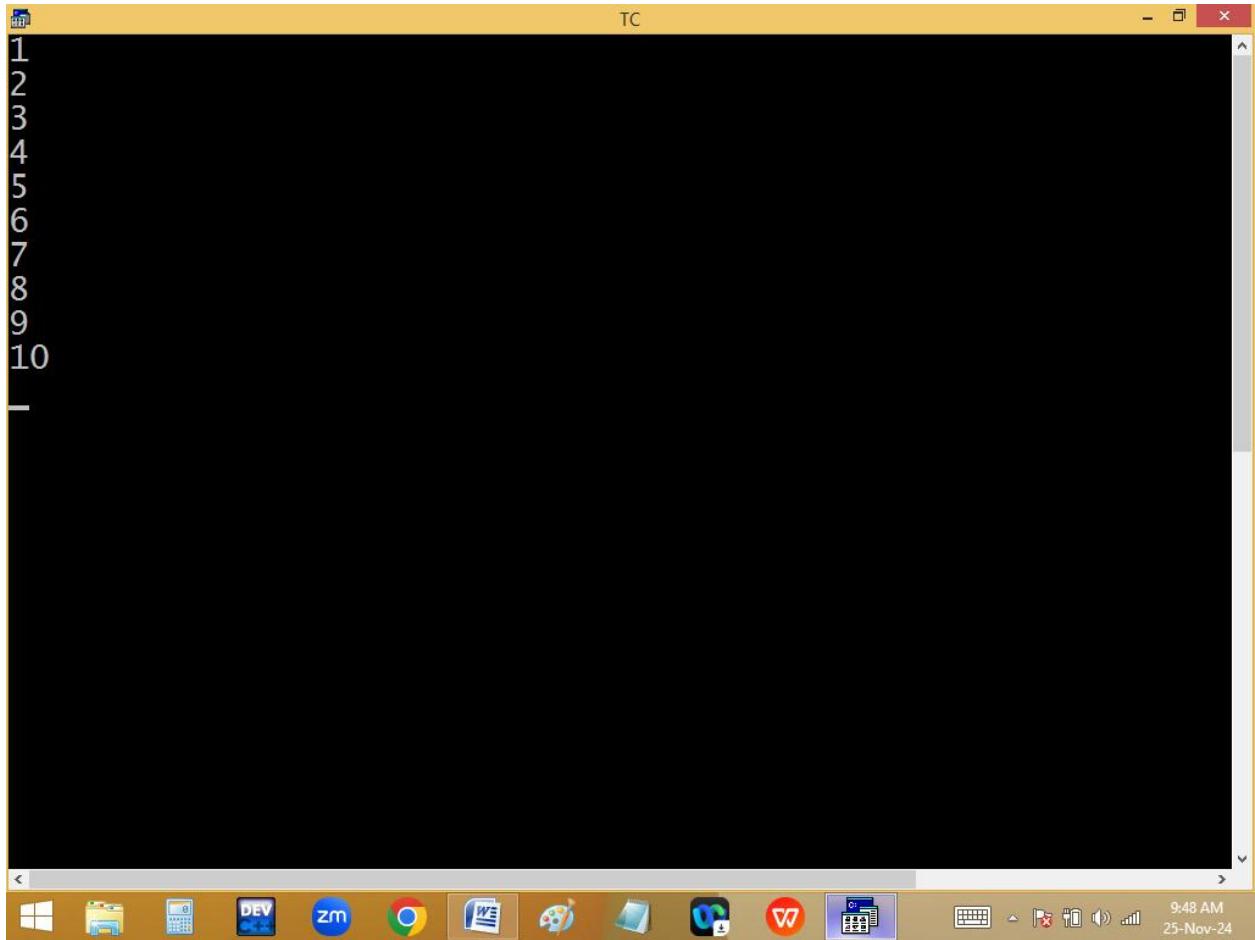


9:55 AM
25-Nov-24

A screenshot of the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 11, Col 1, Insert, Indent, Tab, Fill, Unindent, and E. The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i;
    clrscr();
    for(i=1;i<=10;i++)
    {
        printf("%d\n",i);
    }
    getch();
}
```

The status bar at the bottom shows various icons and the text "9:48 AM 25-Nov-24".



TC

File Edit Run Compile Project Options Debug

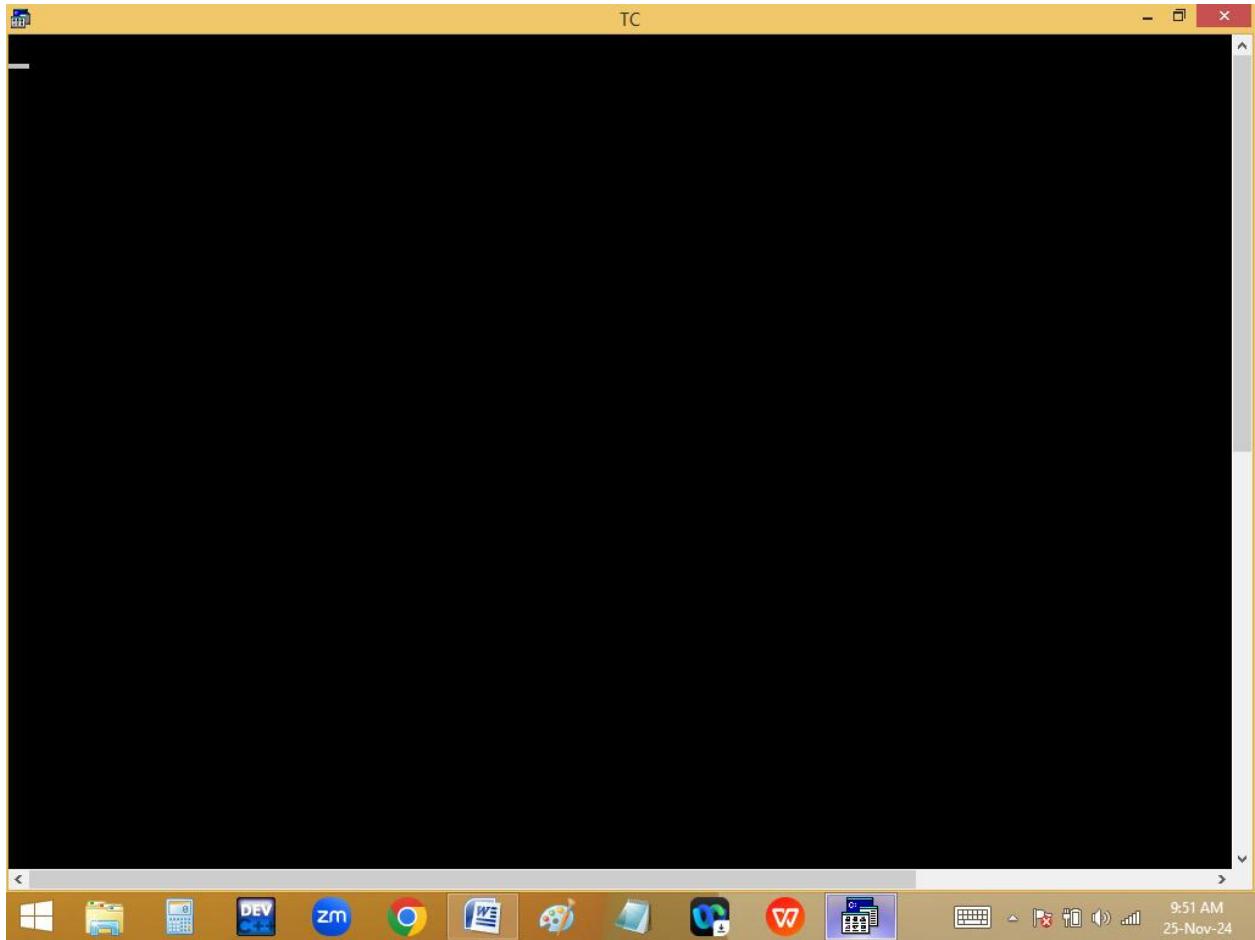
Line 10 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=1;i<=10;i++)
{
continue;
printf("%d\n",i);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F9 Stop F10 Make F11 >



9:51 AM
25-Nov-24



Print 1..10 even no's using continue:

TC

File Edit Run Compile Project Options Debug

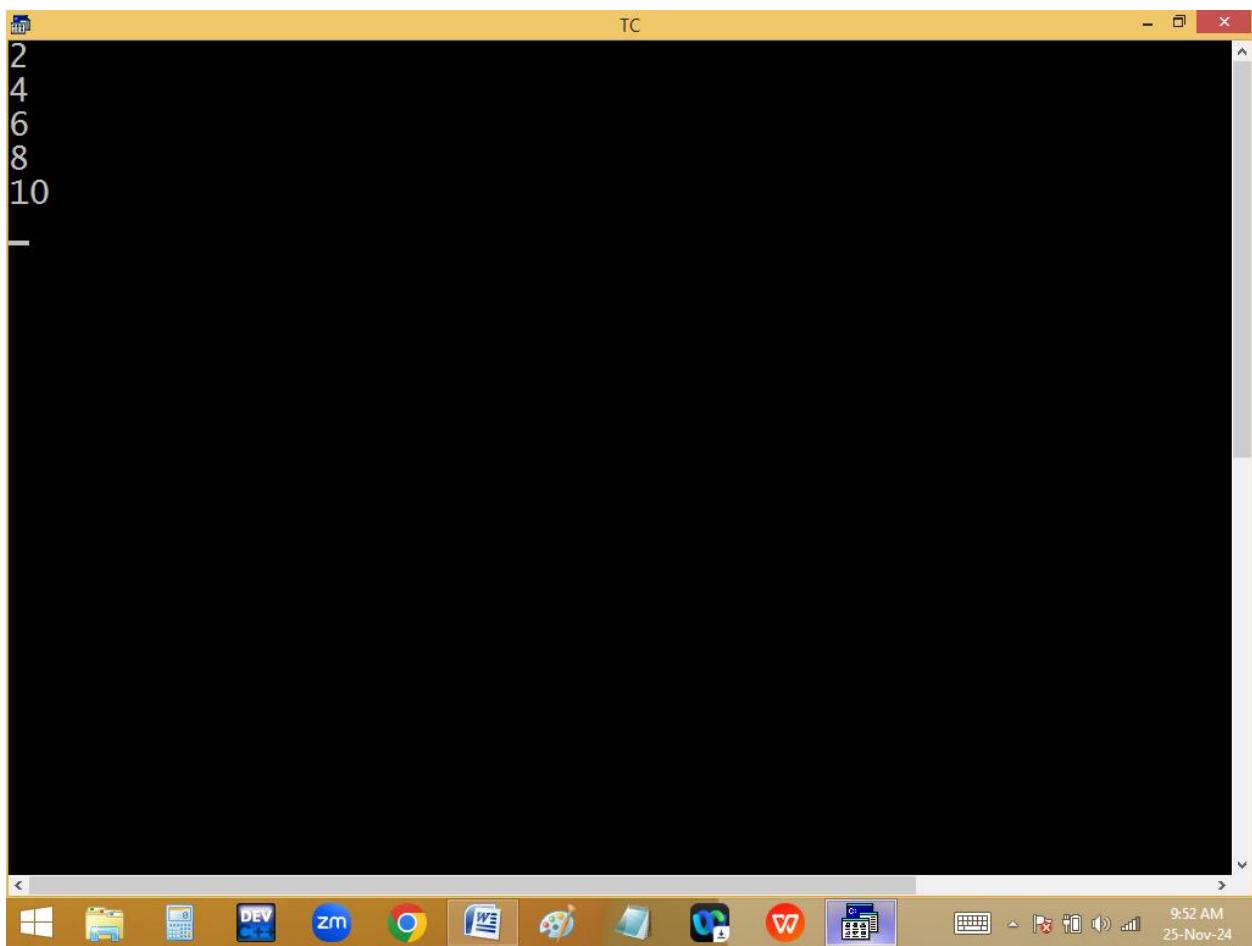
Line 10 Col 13 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=1;i<=10;i++)
{
if(i%2!=0) continue;
printf("%d\n",i);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:52 AM
25-Nov-24



TC

File Edit Run Compile Project Options Debug

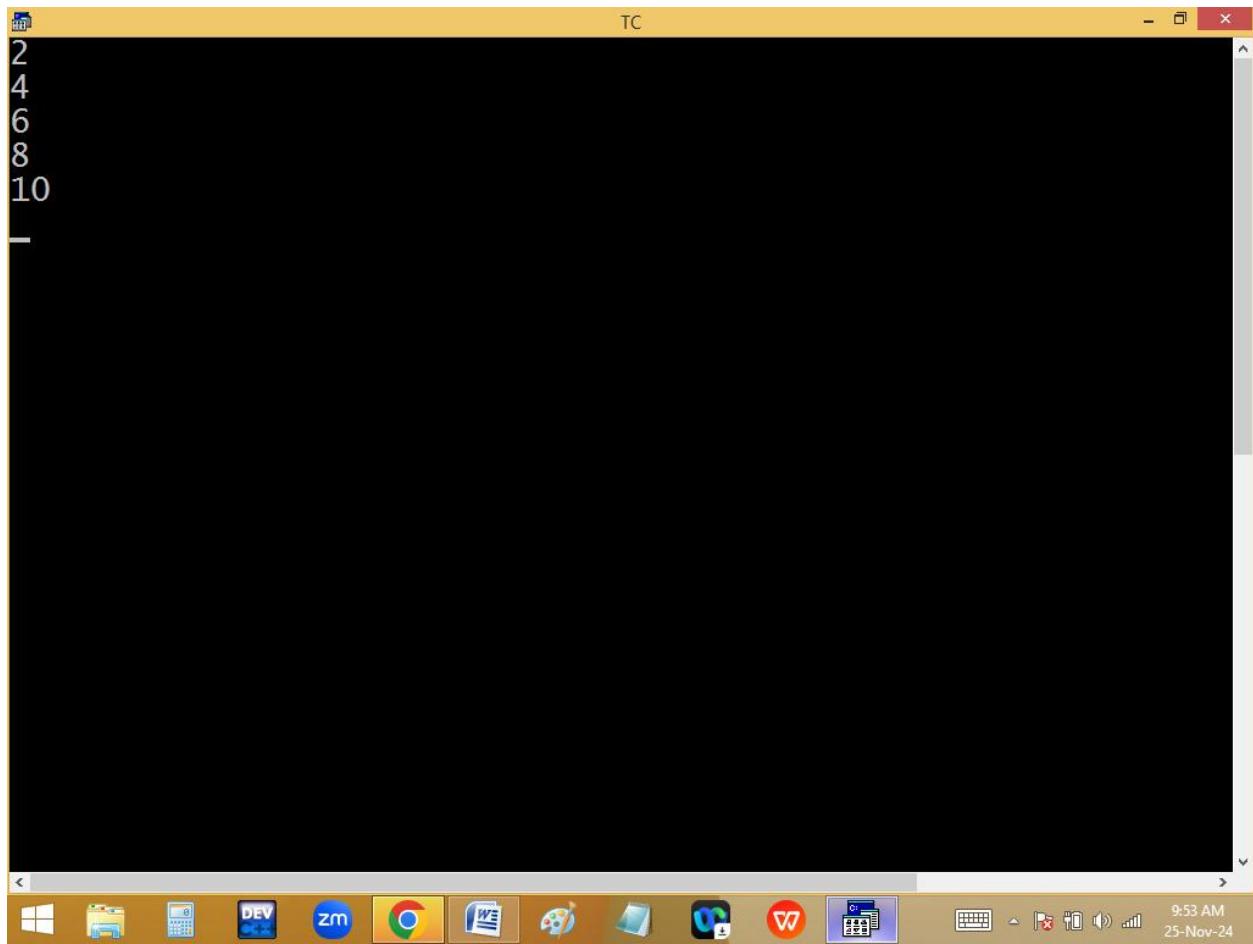
Line 9 Col 7 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=1;i<=10;i++)
{
if(i%2) continue;
printf("%d\n",i);
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:53 AM
25-Nov-24

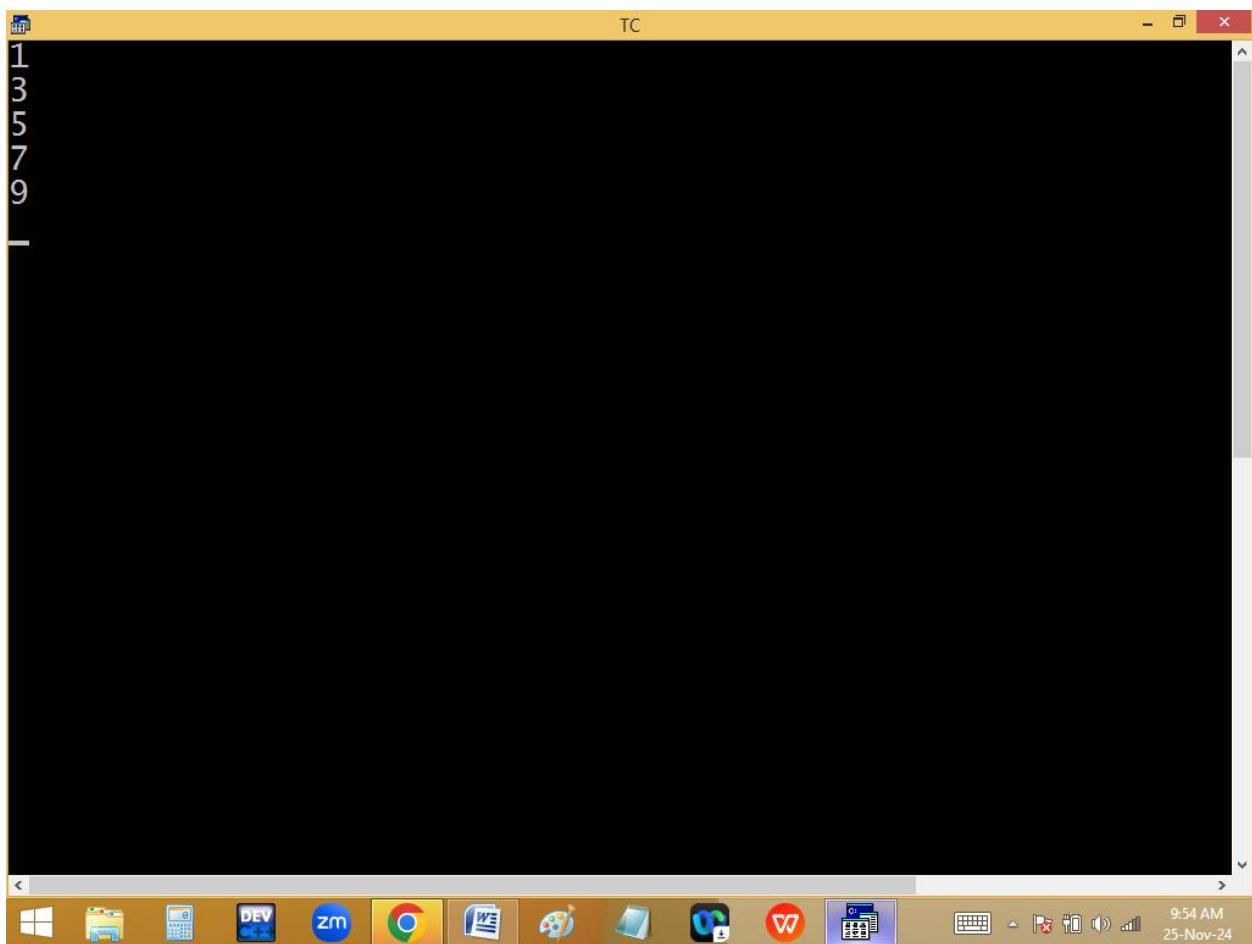


Odd no's:

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window shows "Line 9 Col 10 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i;
clrscr();
for(i=1;i<=10;i++)
{
if(i%2==0) continue;
printf("%d\n",i);
}
getch();
}
```

The taskbar at the bottom of the screen displays several icons for various applications, including File Explorer, Task View, Control Panel, DEV, zm, Google Chrome, File Explorer, Paint, File Explorer, Word, File Explorer, and Task View. The system tray shows the date and time as "9:54 AM 25-Nov-24".



TC

File Edit Run Compile Project Options Debug

Line 12 Col 11 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j;
clrscr();
for(i=1;i<=10;i++)
{
for(j=1;j<=10;j++)
{
if(j>i) continue;
printf("%3d",j);
}
printf("\n");
}
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10 >



9:59 AM
25-Nov-24

```
TC
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9 10
```

A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the TURBO C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top shows "Line 11 Col 14 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i,j;
    clrscr();
    for(i=1;i<=10;i++)
    {
        for(j=1;j<=10;j++)
        {
            if(j>i) break;
            printf("%3d",j);
        }
        printf("\n");
    }
    getch();
}
```

The taskbar at the bottom displays various pinned icons, including DEV, zm, Google Chrome, File Explorer, Paint, Task View, Word, and File Explorer again. The system tray shows the date and time as 10:01 AM on 25-Nov-24.

```
TC
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8 9
1 2 3 4 5 6 7 8 9 10
```

A screenshot of a Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top shows "Line 12 Col 15 Insert Indent Tab Fill Unindent * E". The main code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
int i,j;
clrscr();
for(i=1;i<=10;i++)
{
if(i%2==0)continue;
for(j=1;j<=10;j++)
{
printf("%3d",i);
}
printf("\n");
}
getch();
}
```

The taskbar at the bottom has icons for various applications like File Explorer, Task View, Control Panel, and Microsoft Edge. The system tray shows the date and time as "10:03 AM 25-Nov-24".

```
1 1 1 1 1 1 1 1 1 1 TC
3 3 3 3 3 3 3 3 3 3
5 5 5 5 5 5 5 5 5 5
7 7 7 7 7 7 7 7 7 7
9 9 9 9 9 9 9 9 9 9
```



A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the Turbo C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom of the window shows "Line 14 Col 15 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i,j;
    clrscr();
    for(i=1;i<=10;i++)
    {
        if(i%2==0)continue;
        for(j=1;j<=10;j++)
        {
            if(j%2!=0)continue;
            printf("%3d",j);
        }
        printf("\n");
    }
    getch();
}
```

The taskbar at the bottom of the screen displays various pinned icons, including Windows Start, File Explorer, Task View, Task Switcher, Zoom, Switch, Trace, Stop, Make, and others. The system tray shows the date and time as 10:05 AM on 25-Nov-24.

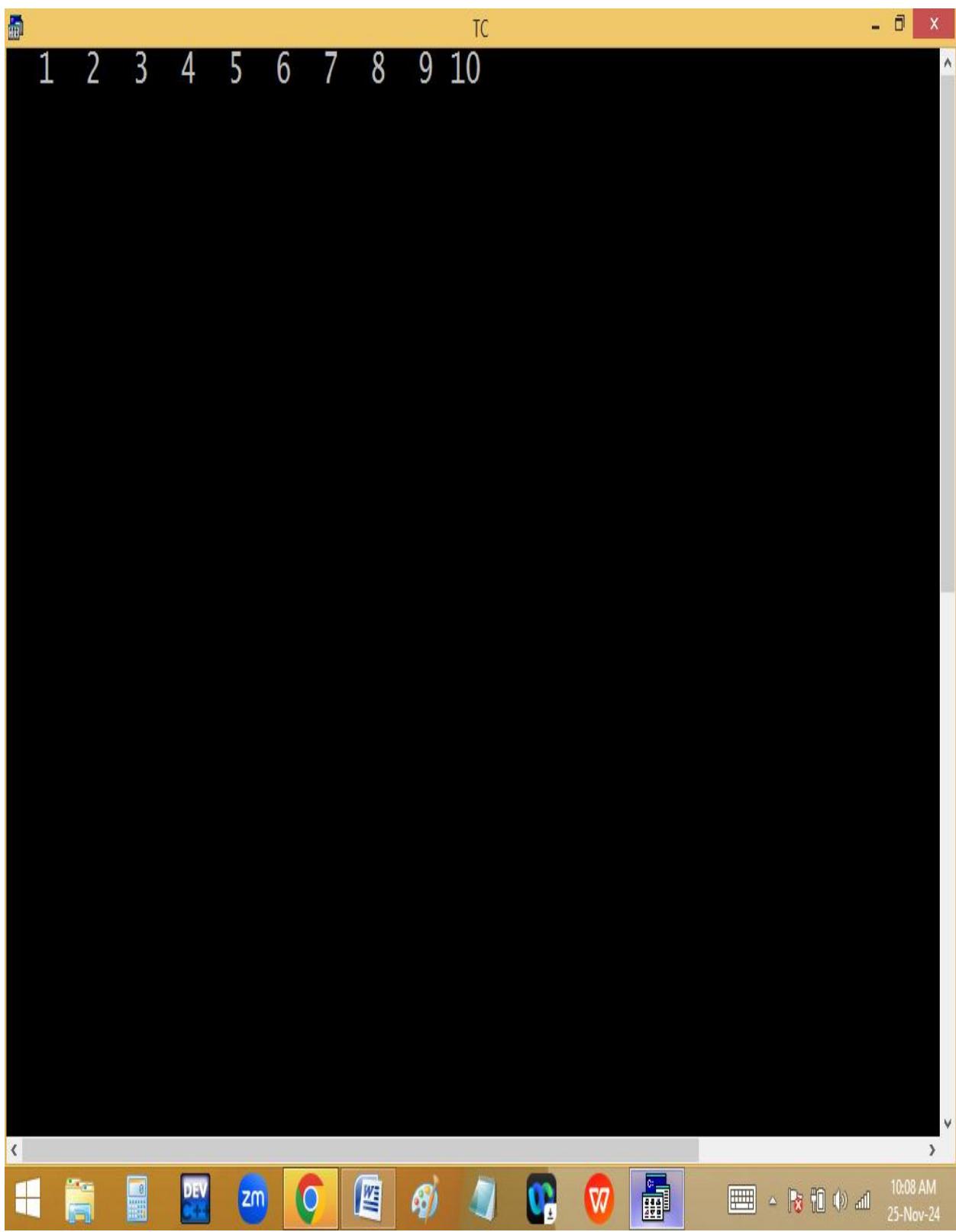
```
TC
2 4 6 8 10
2 4 6 8 10
2 4 6 8 10
2 4 6 8 10
2 4 6 8 10
```



A screenshot of a Microsoft Windows operating system desktop. In the center is a window for the Turbo C++ compiler (TC). The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 12 Col 14 Insert Indent Tab Fill Unindent * E". The code editor contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int i,j;
    clrscr();
    for(i=1;i<=10;i++)
    {
        if(i%2==0)continue;
        for(j=1;j<=10;j++)
        {
            if(i>j)break;
            printf("%3d",j);
        }
        printf("\n");
    }
    getch();
}
```

The taskbar at the bottom of the screen shows several pinned icons: File Explorer, Task View, Calculator, DEV, Zoom, Switch, Trace, Stop, Make, and a folder icon. To the right of the taskbar, the system tray displays the date and time as "10:08 AM 25-Nov-24".



ARRAYS

It is collection of homogeneous [same type] variables.

Array is nothing but collection of contiguous memory locations, where we can store and manage more than one value of same type under one name.

It is a derived data type.

It is an implicit / internal pointer.

It is a implicit const pointer

It is one of data structure.

Advantages:

Generally to store several values of same type, we have to declare several variables. Here we have to remember all these variable names also. When the program is too big, it is very difficult to remember all the variable names. In this situation, the only solution is array.

Array reduce program length.

Array minimize the errors.

In functions to carry several values of same type at a time, we are using arrays.

It allows to arrange our data in a order.

Disadvantage:

Array size is Constant Positive Integer value. Due to this we are not able to change the array size at run time. Sometimes it causes memory wastage / shortage.

In C language we are using

- 1. One dimensional arrays**
- 2. Multi dimensional arrays**

One dimensional arrays:

- An array with one row and several columns.**
- An array with single subscripting operator [] is called one dimensional array.**
- It is an implicit single pointer.**

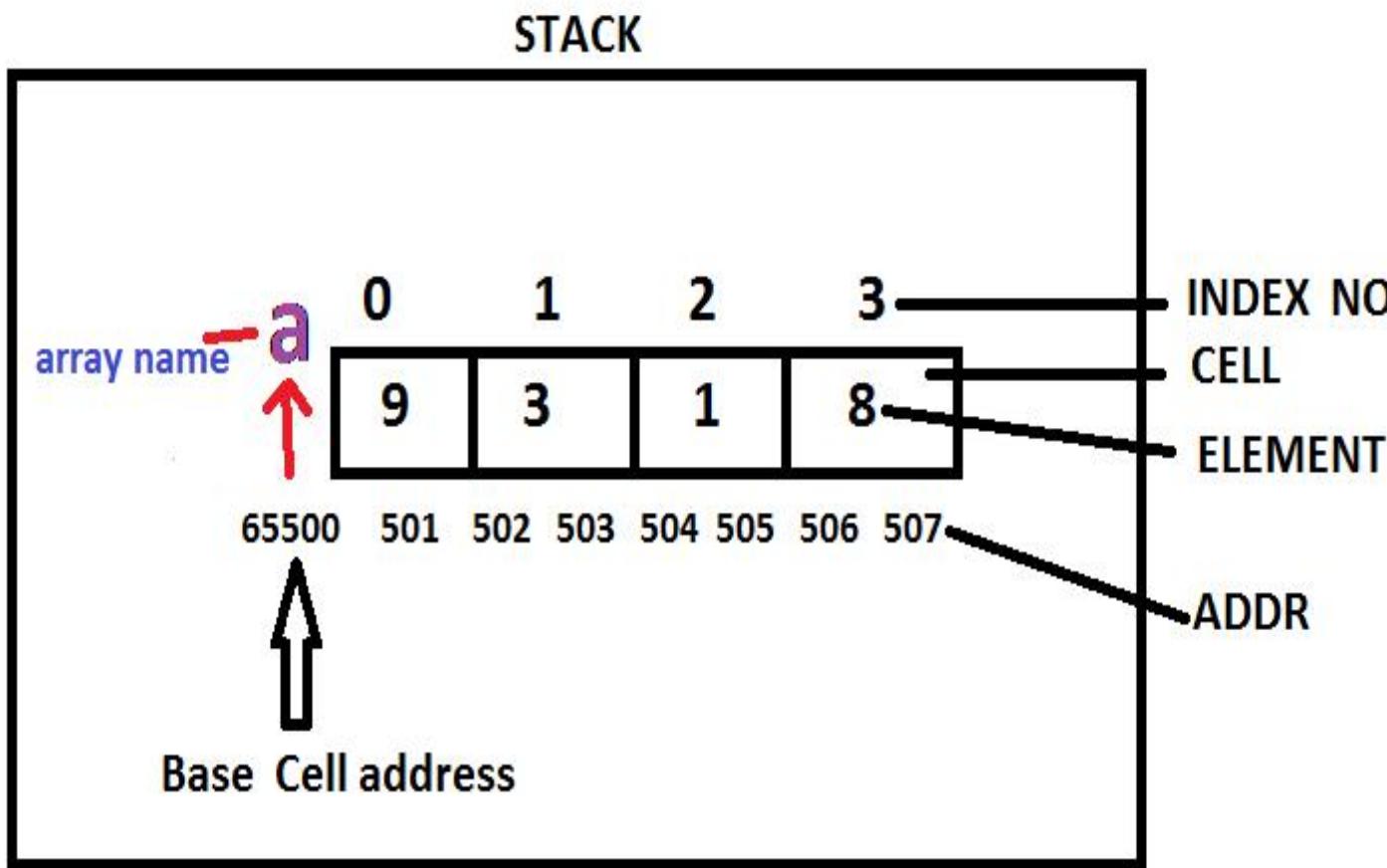
Syntax:

datatype variable[size] = {elements};

Eg:

int a[4] = { 9, 3, 1, 8 };

Memory allocation for array:



Array is implicit pointer because of array variable stores base cell [0 cell 1st byte] address. Hence array variable value and 0 cell address both are same.

Array declaration methods:

int a[3]; Ok

int a[]; No

int a[3]={1,2,3}; Ok

int a[]={1,2,3}; Ok

int a[0]={1,2,3}; Ok

int a[-5]; No

int a[5.5]; No

int n = 5, a[n]; No

int a[3]={10,20}; Ok

int a[3]={1, 2, 3, 4}; No

int a[0]; error

#define n 5 /* macro */

int a[n]; Ok

const int n=5, a[n]; No

int a[5>3]; → int a[1]; Ok

int a[3<2]; → int a[0]; No

int a[2+3]; → int a[5]; Ok

int a[5%3]; → int a[2]; Ok

int a[5%5]; → int a[0]; No

int a[1,2,3]; → error

int a[40000]; → 40000 * 2 = 80000 bytes → No

Note: Stack size is 65536 bytes(64kb) Only.

float a[10000]; Ok → 10000 * 4 = 40000 bytes

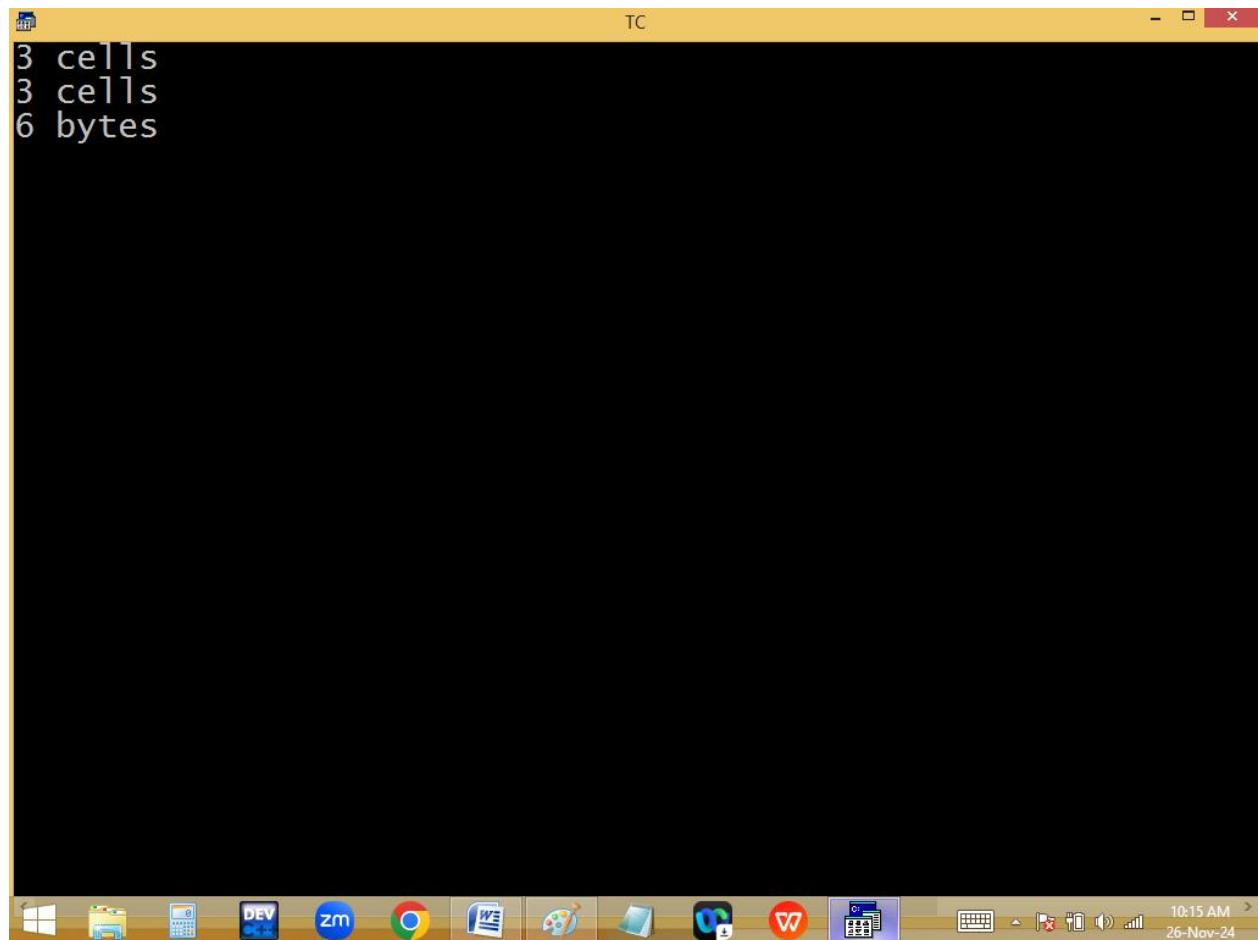
float a[20000]; No → 20000 * 4 = 80000 bytes

Finding array size:

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 9, Col 32. The code window contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[3]={9,15,27};
    clrscr();
    printf("%d cells\n",sizeof(a)/sizeof(int));
    printf("%d cells\n",sizeof(a)/sizeof(a[0]));
    printf("%d bytes\n",sizeof(a));
    getch();
}
```

The F1 key is highlighted in red, and the F1 key label is also red. The taskbar at the bottom shows various application icons, and the system tray indicates the date and time as 10:15 AM, 26-Nov-24.



TC

File Edit Run Compile Project Options Debug

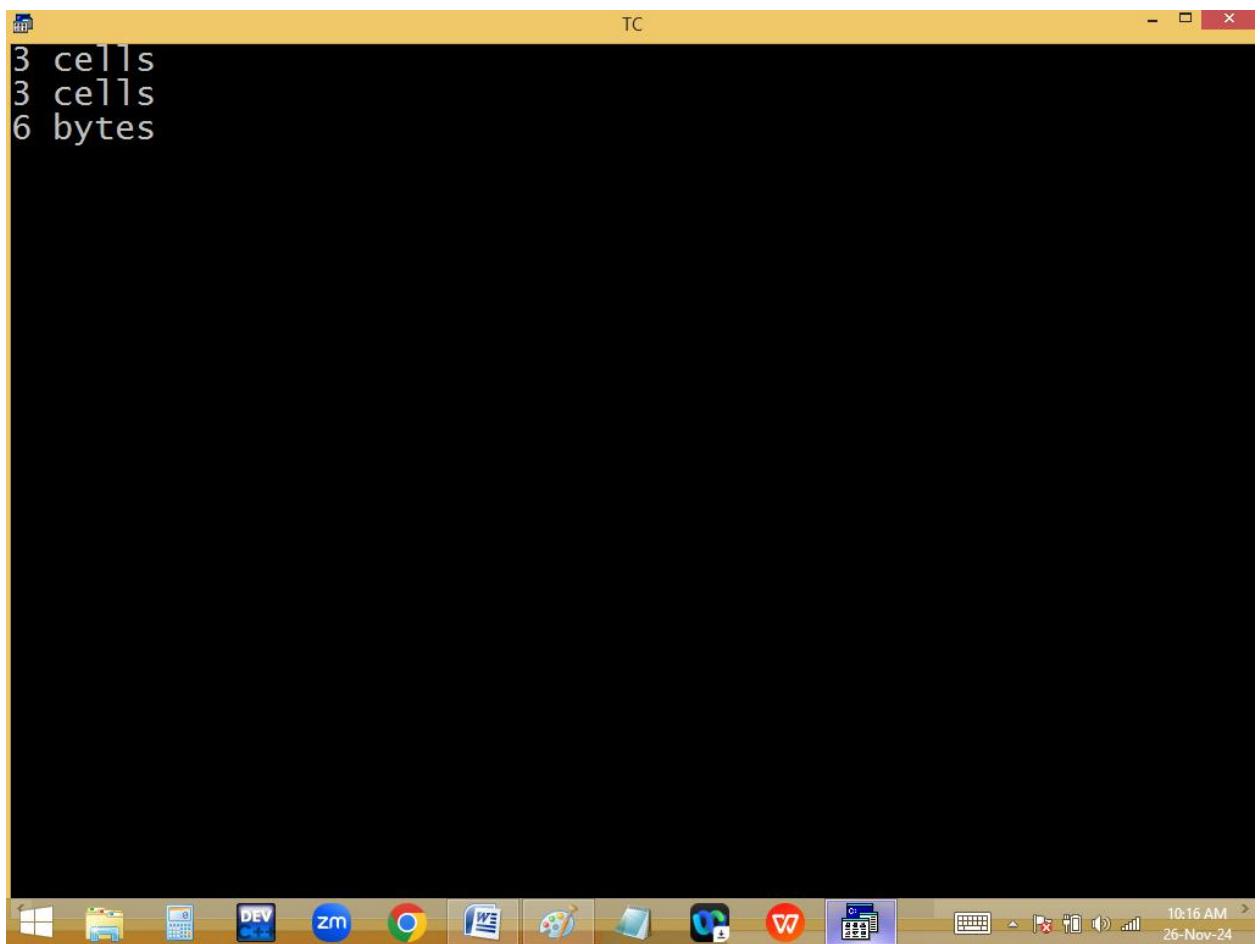
Line 5 Col 7 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[]={9,15,27};
clrscr();
printf("%d cells\n",sizeof(a)/sizeof(int));
printf("%d cells\n",sizeof(a)/sizeof(a[0]));
printf("%d bytes\n",sizeof(a));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:16 AM 26-Nov-24



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. A prominent red error message is displayed in the main window: "Error: Size of structure or array not known in function main". Below the message is the C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[];
    clrscr();
    printf("%d cells\n", sizeof(a)/sizeof(int));
    printf("%d cells\n", sizeof(a)/sizeof(a[0]));
    printf("%d bytes\n", sizeof(a));
    getch();
}
```

The status bar at the bottom shows keyboard shortcuts for F1-Help through F10-Make, along with system icons for task switching, zoom, and system status.

Finding array element index no, value and address:

TC

File Edit Run Compile Project Options Debug

Line 7 Col 17 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4]={9,3,1,8},i;
clrscr();
for(i=0;i<4;i++)
printf("a[%d]cell value=%d, address=%u\n",i,a[i],&a[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:20 AM 26-Nov-24

The screenshot shows a Windows desktop environment. In the center is a terminal window titled "TC" with a black background and white text. It displays the following output:

```
a[0]cell value=9, address=65496
a[1]cell value=3, address=65498
a[2]cell value=1, address=65500
a[3]cell value=8, address=65502
```

Below the terminal window is a taskbar with various icons for applications like File Explorer, Task View, and system utilities. The system tray shows the date and time as "26-Nov-24" and "10:20 AM".

Finding array base address:

TC

File Edit Run Compile Project Options Debug

Line 7 Col 33 Insert Indent Tab F11 Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4]={9,3,1,8},i;
clrscr();
printf("a[0]cell address=%u\n",&a[0]);
printf("a stored value =%u\n",a);
printf("a address is      =%u\n",&a);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:22 AM 26-Nov-24

```
a[0]cell address=65496
a stored value =65496
a address is =65496
```

Eg: Direct initialization of array elements:

TC

File Edit Run Compile Project Options Debug

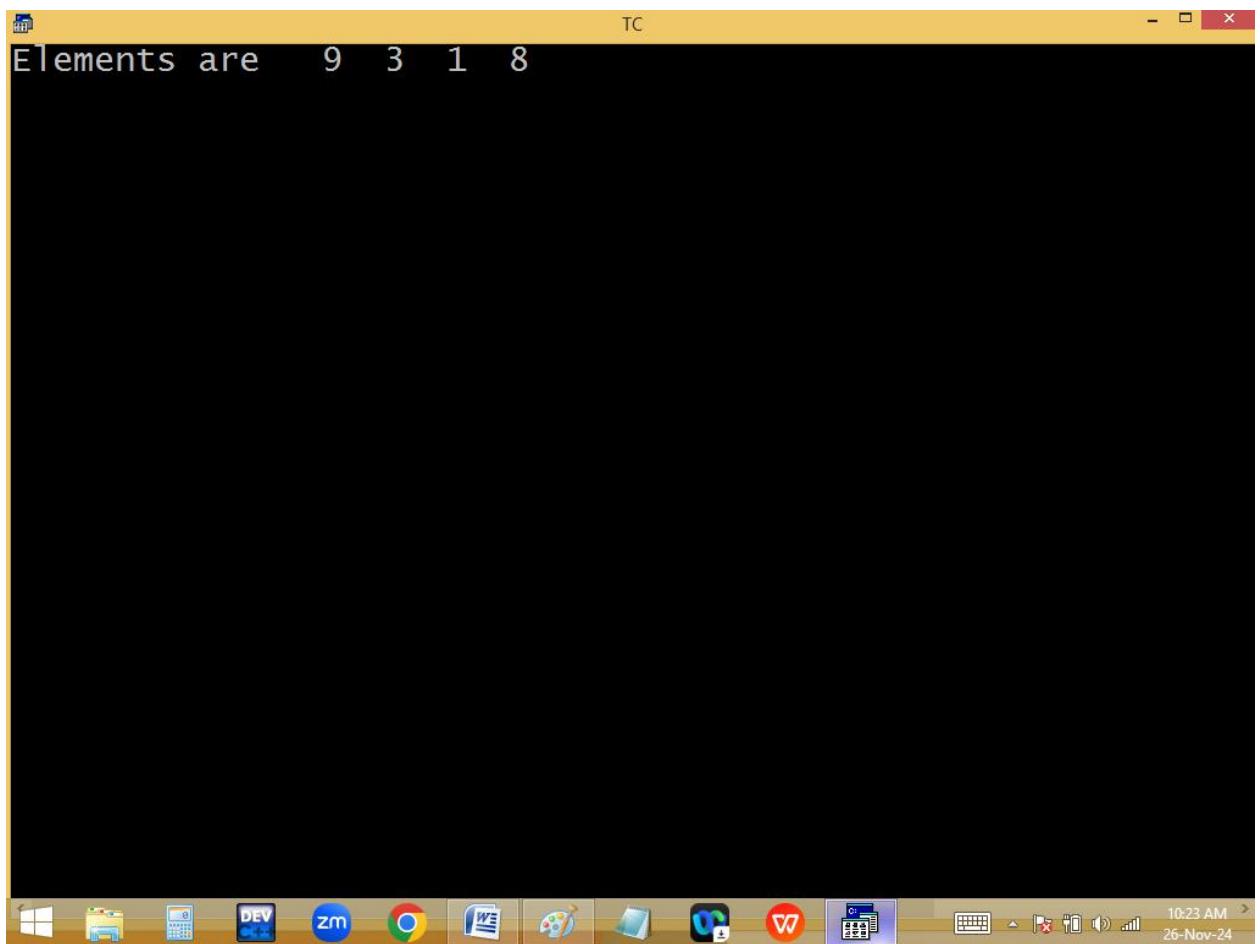
Line 9 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4]={9,3,1,8},i;
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%3d",a[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:23 AM 26-Nov-24



TC

File Edit Run Compile Project Options Debug

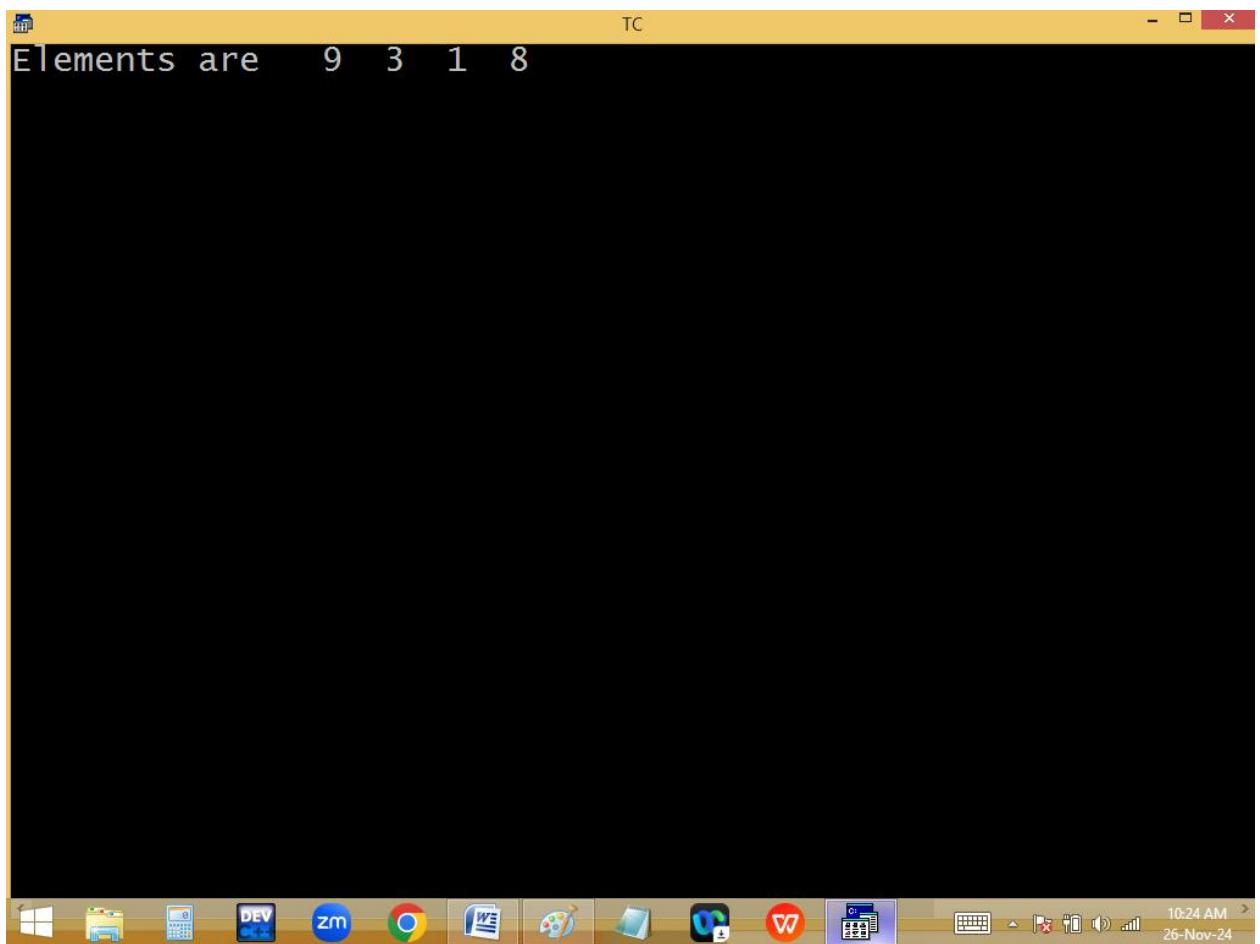
Line 8 Col 33 Insert Indent Tab F11 Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4]={9,3,1,8},i;
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%3d",i[a]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:24 AM 26-Nov-24



TC

File Edit Run Compile Project Options Debug

Line 11 Col 15 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4]={9},i;
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%3d",i[a]);
getch();
}
/* 9 0 0 0 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:25 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 8 Col 27 Insert Indent Tab F11 Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[]={9},i;
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%4d",a[i]);
getch();
}
/* 9 gr gr gr */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:26 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 5 Col 24 Insert Indent Tab F11 Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[4],i; /* local */
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%4d",i[a]);
getch();
}
/* gr gr gr gr */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:26 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 11 Col 11 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    static int a[4],i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* 0 0 0 0 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:27 AM 26-Nov-24

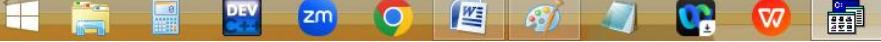
TC

File Edit Run Compile Project Options Debug

Line 6 Col 1 Insert Indent Tab F11 Unindent * E

```
#include<stdio.h>
#include<conio.h>
int a[4],i; /* global */
void main()
{
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%4d",i[a]);
getch();
}
/* 0 0 0 0 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:27 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Incompatible type conversion in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a[4]=9,i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:28 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Initializer syntax error in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a[4]={},i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:28 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Initializer syntax error in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a[4]={{1,2},{3,4}},i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:29 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 12 Col 11 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>

void main()
{
int a[4]={1.1,2.2,3.3,4.4},i; /* local */
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%4d",i[a]);
getch();
}
/* 1 2 3 4 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:30 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 12 Col 21 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int a[4]={'1',2>3,4>2,40000},i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* 49  0   1    -25536 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:33 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Expression syntax in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
int a[4]={1,2, ,4},i; /* local */
clrscr();
printf("Elements are ");
for(i=0;i<4;i++)printf("%4d",i[a]);
getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:34 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Constant expression required in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
    int n=4, a[n]={9,3,1,8},i; /* Local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:36 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Constant expression required in function main

```
#include<stdio.h>
#include<conio.h>

void main()
{
    const int n=4, a[n]={9,3,1,8},i; /* Local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10

Windows Start File Explorer Task View Microsoft Edge Zoom In Microsoft Word Microsoft Paint Microsoft Excel Microsoft Access 10:37 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Lvalue required in function main

```
#include<stdio.h>
#include<conio.h>
#define n 4 /* macro */
void main()
{
    int a[4]={9,3,1,8},b[4],i; /* local */
    b=a;
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",b[i]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:41 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 11 Col 14 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#define n 4 /* macro */
void main()
{
int a[4]={9,3,1,8},b[4]={9,3,1,8},i; /* local */
clrscr();
if(a==b)puts("equal");else puts("not equal");
getch();
}
/*not equal*/_
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:43 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 12 Col 11 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#define n 4 /* macro */
void main()
{
    int a[n]={9,3,1,8},i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",i[a]);
    getch();
}
/* 9 3 1 8 */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:38 AM 26-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Incompatible type conversion in function main

```
#include<stdio.h>
#include<conio.h>
#define n 4 /* macro */
void main()
{
    int a[4]={9,3,1,8},b[4]=a,i; /* local */
    clrscr();
    printf("Elements are ");
    for(i=0;i<4;i++)printf("%4d",b[i]);
    getch();
}
/* Error */
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10
Windows Start File Explorer Task View Microsoft Edge Zoom In Microsoft Word Microsoft Paint Microsoft Outlook Microsoft Word 10:40 AM 26-Nov-24

Reading and printing n elements of array:

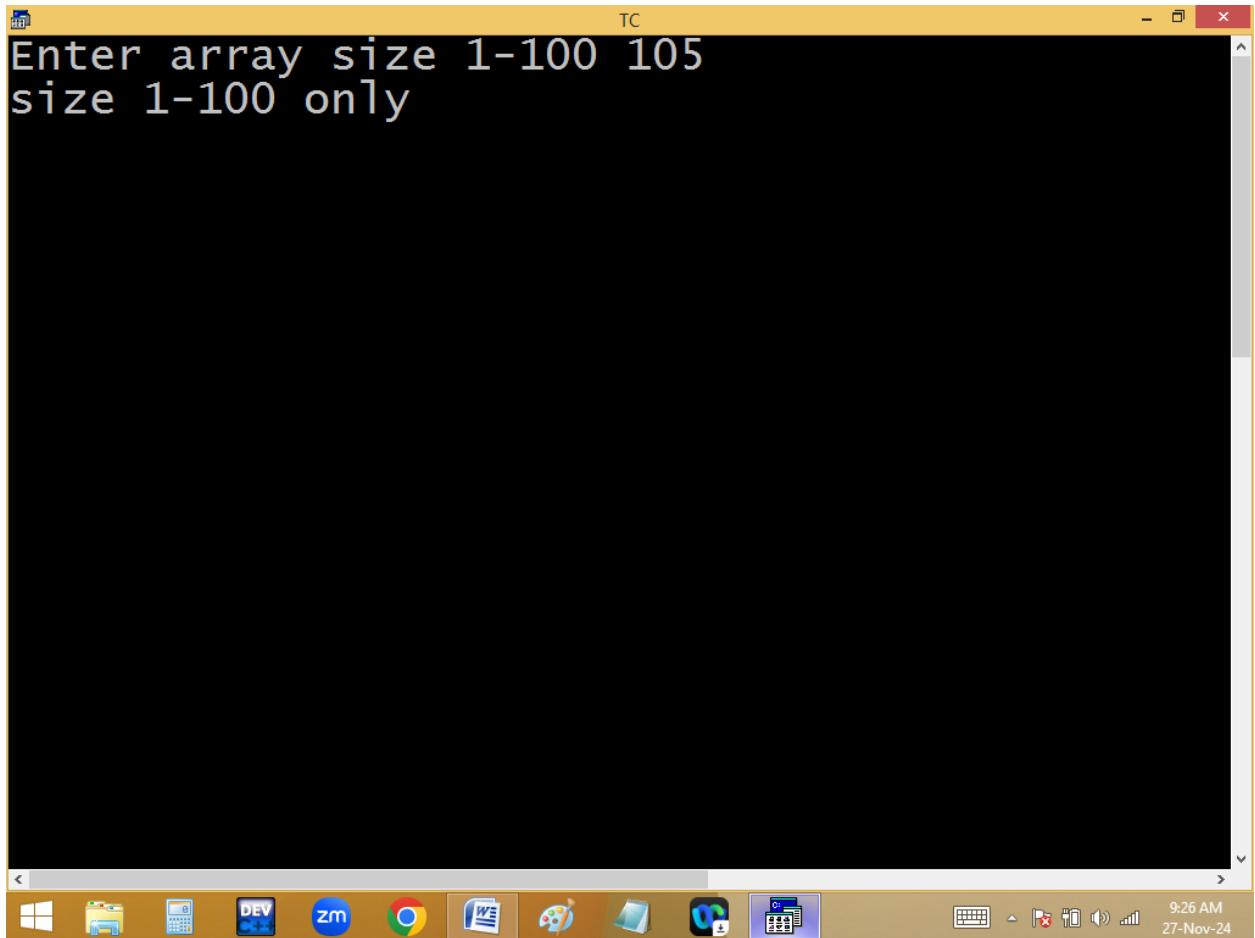
```
Line 18 Col 2 Insert Indent Tab File  
#include<stdio.h>  
#include<conio.h>  
void main()  
{  
    int a[100], i, n;  
    clrscr();  
    printf("Enter array size 1-100 ");  
    scanf("%d", &n);  
    if(n<1 || n>100) puts("size 1-100 only");  
    else  
    {  
        printf("Enter %d integers ", n);  
        for(i=0; i<n; i++) scanf("%d", &a[i]);  
        printf("Elements ");  
        for(i=0; i<n; i++) printf("%4d", a[i]);  
    }  
    getch();  
}
```



TC

```
Enter array size 1-100 -4
size 1-100 only
```





A screenshot of a Windows operating system desktop. At the top is a black command-line window titled "TC". Inside the window, the following text is displayed:

```
Enter array size 1-100 4
Enter 4 integers 4 0 1 -5
Elements    4   0   1   -5_
```

The window has standard minimize, maximize, and close buttons at the top right. Below the window is a light-colored taskbar containing several icons for various applications like File Explorer, Edge, and Paint. On the far right of the taskbar, the date and time are shown as "9:26 AM 27-Nov-24".

Finding stu result using array:

TC

File Edit Run Compile Project Options Debug

Line 20 Col 24 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int id,sub[6],tot=0,i,p=1;
    char name[30];
    float avg;
    clrscr();
    printf("Enter stu id "); scanf("%d",&id); flushall();
    printf("Enter stu name "); gets(name);
    printf("Enter 6 sub marks ");
    for(i=0;i<6;i++)
    {scanf("%d",&sub[i]);tot+=sub[i];if(sub[i]<35)p=0;}
    avg=tot/6.0;
    printf("%s tot=%d, avg=%.2f and got ",name,tot,avg);
    if(p==0)puts("Failed");
    else if(avg>=75)puts("Distinction");
    else if(avg>=60)puts("1st class");
    else if(avg>=50)puts("2nd class");
    else puts("3rd class");
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10



9:34 AM 27-Nov-24

```
TC
Enter stu id 101
Enter stu name Krish
Enter 6 sub marks 99 89 90 88 78 87
Krish tot=531, avg=88.50 and got Distinction
```





TC



```
Enter stu id 102
Enter stu name bablu
Enter 6 sub marks 54 45 40 37 43 39
bablu tot=258, avg=43.00 and got 3rd class
```



```
TC
Enter stu id 103
Enter stu name john
Enter 6 sub marks 45 33 40 30 50 45
john tot=243, avg=40.50 and got Failed
```



Decimal to binary conversion:

n=20 → 0000 0000 0001 0100

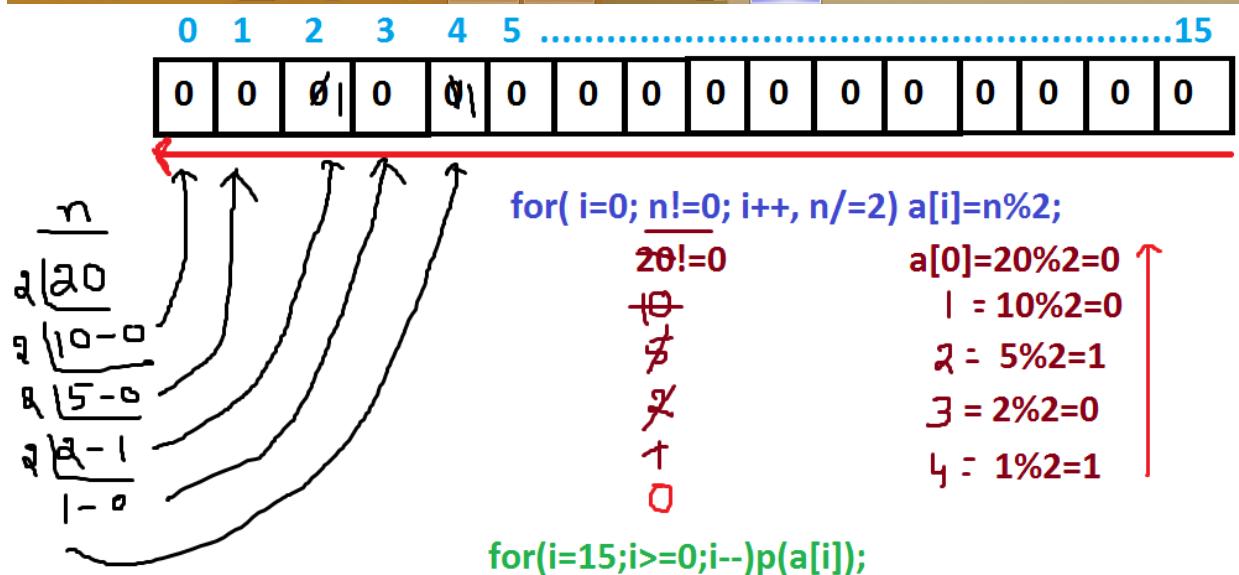
The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 11, Col 1, Insert, Indent, Tab, Fill, Unindent, and *. Below the menu is a code editor window containing the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[16]={0},i,n;
    clrscr();
    printf("Enter a no "); scanf("%d",&n);
    for(i=0;n!=0;n/=2,i++)a[i]=n%2; /*dec to bin*/
    printf("Binary code ");
    for(i=15;i>=0;i--)printf("%2d",a[i]);
    getch();
}
```

The status bar at the bottom displays F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10, and various system icons. The system tray shows the date and time as 27-Nov-24, 9:47 AM.

TC

```
Enter a no 20
Binary code 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0
```



Decimal to octal:

3 \sqrt{20}

3 - 4 ✓

TC

File Edit Run Compile Project Options Debug

Line 8 Col 46 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[16]={0},i,n;
    clrscr();
    printf("Enter a no "); scanf("%d",&n);
    for(i=0;n!=0;n/=8,i++)a[i]=n%8; /*dec to octal*/
    printf("Octal code ");
    for(i=15;i>=0;i--)printf("%2d",a[i]);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10



9:48 AM 27-Nov-24

```
TC
Enter a no 20
Octal code 0 0 0 0 0 0 0 0 0 0 0 0 0 2 4
```

Decimal to hexadecimal:

$$\begin{array}{r} 16 \\ \sqrt{20} \\ \hline 1-4 \end{array}$$

16 | 45

2 - 13

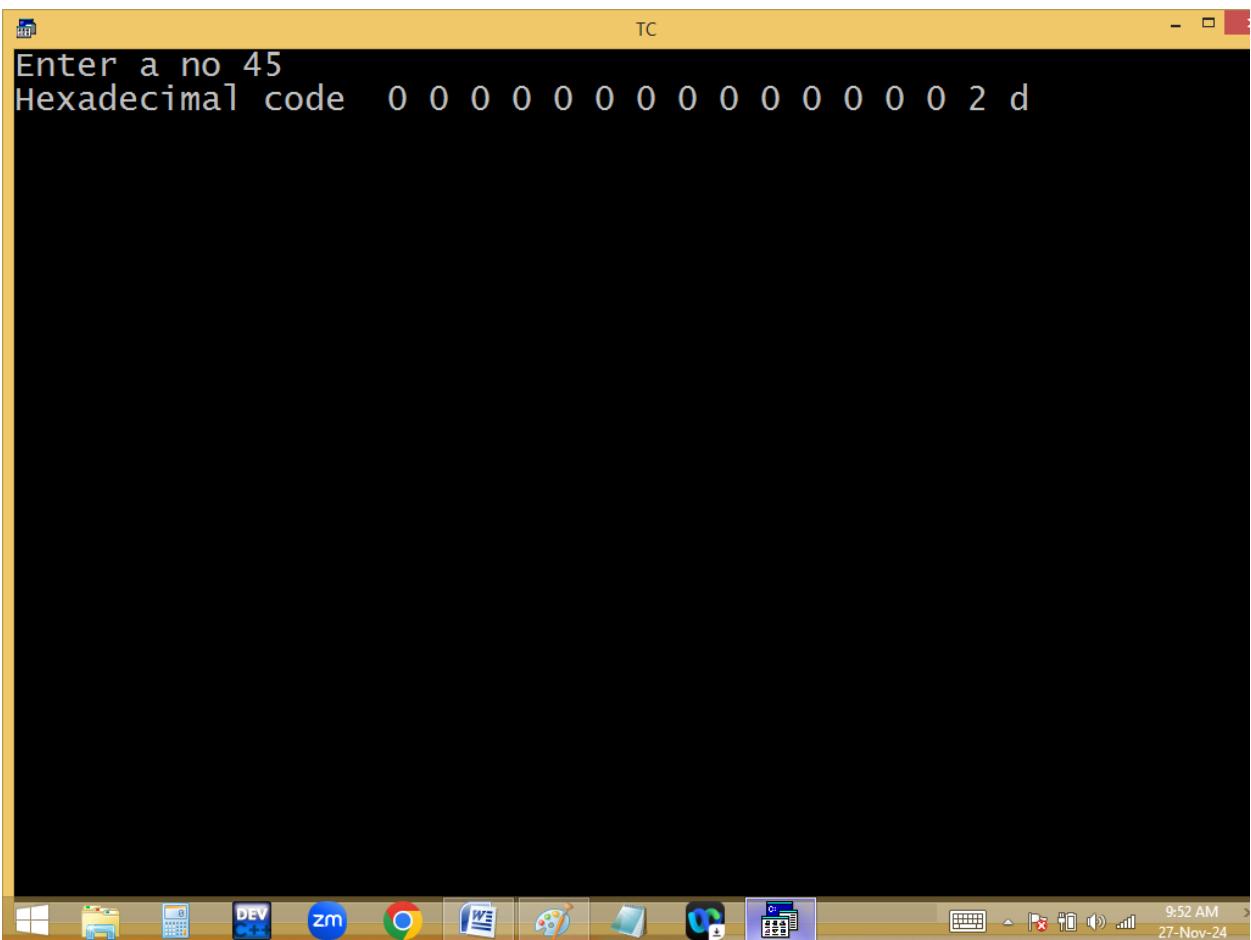
d

TC

```
File Edit Run Compile Project Options Debug
Line 11 Col 40 Insert Indent Tab Fill Unindent * E
#include<stdio.h>
#include<conio.h>
void main()
{
int a[16]={0},i,n;
clrscr();
printf("Enter a no "); scanf("%d",&n);
for(i=0;n!=0;n/=16,i++)a[i]=n%16; /*dec to hexa*/
printf("Hexadecimal code ");
for(i=15;i>=0;i--)
if(a[i]>=10)printf("%2c",87+a[i]);else printf("%2d",a[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10

9:52 AM 27-Nov-24



A screenshot of a terminal window titled "TC". The window contains the following text:

Enter a no 95
Hexadecimal code 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 5 f_

The desktop background is black, and the taskbar at the bottom features several icons for applications like File Explorer, DEV, zm, Google Chrome, Microsoft Word, Paint, and FileZilla.

A screenshot of a Windows operating system desktop. At the top, there's a taskbar with several pinned icons, including File Explorer, a browser, and a file manager. The main screen shows a dark terminal window with white text. The text displays the command "Enter a no 34" followed by its hexadecimal representation "Hexadecimal code 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 2". The desktop background is black, and the overall interface is typical of a Windows 7 or 8 environment.

Read n elements into array and find the max, min elements.

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 19, Col 1, Insert, Indent, Tab, Fill, Unindent, and Exit. The code area contains a C program to find the minimum and maximum values in an array. The F1-F10 keys are labeled at the bottom, along with various system icons and the date/time (10:06 AM, 27-Nov-24).

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, max, min;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    max=min=a[0];
    for(i=1; i<n; i++)
    {
        if(max<a[i]) max=a[i];
        if(min>a[i]) min=a[i];
    }
    printf("Min=%d, Max=%d", min, max);
    getch();
}
```

```
TC
Enter array size 1-100 9
Enter 9 elements 1 0 5 9 -2 6 9 -5 7
Min=-5, Max=9
```

max=min=a[0];

```
for(i=1; i<5; i++)
{
if(max < a[i]) max=a[i];
if(min > a[i]) min=a[i];
}
p(max, min);
```

9	4	-1	-7	20
0	1	2	3	4

n	i	max	min
5	1	<u>9 < 4</u>	<u>9 > 4</u>
	2	<u>9 < 1</u>	<u>9 > -1</u>
	3	<u>9 < -1</u>	<u>-1 > -7</u>
	4	<u>-1 < 20</u>	<u>-7 > 20</u>

Finding no of even/odd/zero elements in given array:

TC

File Edit Run Compile Project Options Debug

Line 1 Col 40 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100],i,n,e,o,z;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d",&n);
    printf("Enter %d elements ",n);
    for(e=o=z=i=0;i<n;i++)
    {
        scanf("%d",&a[i]);
        a[i]==0?z++:a[i]%2==0?e++:o++;
    }
    printf("Even=%d, Odd=%d, Zero=%d",e,o,z);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10

10:16 AM 27-Nov-24

```
TC
Enter array size 1-100 9
Enter 9 elements 1 0 5 9 -4 7 50 4 0
Even=3, Odd=4, Zero=2_
```

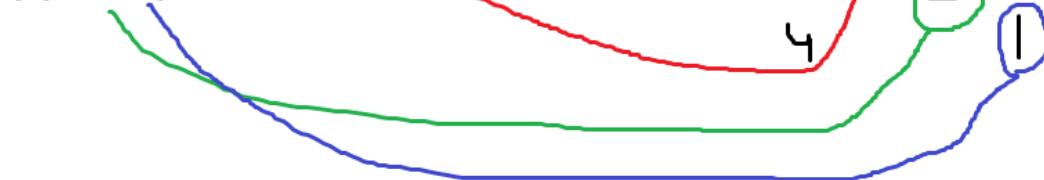
```
for(i=0;i<5;i++)
{
scanf("%d",&a[i]);
if(a[i]==0)z++;
else if(a[i]%2==0)e++;
else o++;
}
p(e, o, z);
```

90	4	-1	-7	0
----	---	----	----	---

0 1 2 3 4

n i e o z
5 0 0 0 0 0

1 2 3 4
| | | |
2 2 1



Arranging array elements in reverse order:

Printing:

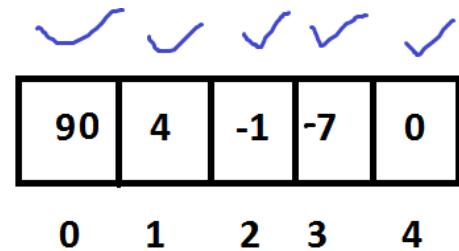
The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, Line 12, Col 1, Insert, Indent, Tab, Fill, Unindent, and End. The code editor displays the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    puts("In reverse order ");
    for(n--; n>=0; n--) printf("%4d", a[n]);
    getch();
}
```

The status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10, and the system clock 10:19 AM, date 27-Nov-24.

```
TC
Enter array size 1-100 5
Enter 5 elements 1 0 3 8 4
In reverse order
4     8     3     0     1_
```

for(i=n-1; i>=0; i--) p(a[i]);



5

Permanent arrangement:

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 15, Col 33. The code area contains a C program that prompts the user for an array size and elements, then prints them in reverse order. The code uses standard input-output functions like printf and scanf.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, t;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    for(i=0; i<n/2; i++)
    {
        t=a[i]; a[i]=a[n-i-1]; a[n-i-1]=t;
    }
    puts("In reverse order ");
    for(i=0; i<n; i++) printf("%4d", a[i]);
    getch();
}
```

```
TC
Enter array size 1-100 5
Enter 5 elements 90 4 -1 -7 0
In reverse order
0  -7  -1   4   90
```



TC

```

Enter array size 1-100 4
Enter 4 elements 1 2 3 4
In reverse order
 4   3   2   1

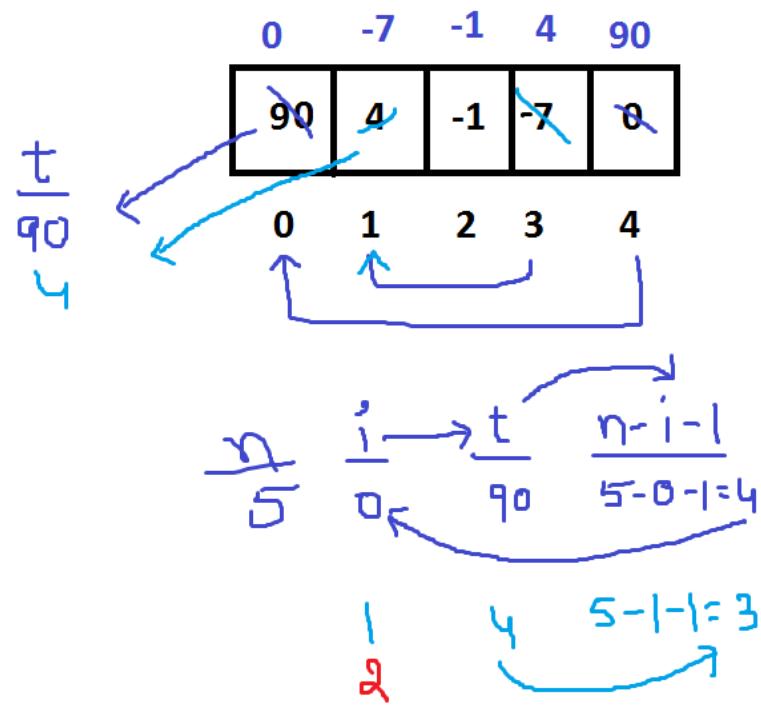
```

Windows Taskbar: 10:29 AM, 27-Nov-24

```

for(i=0;i<5/2;i++)
{
    int t=a[i];
    a[i]=a[n-i-1];
    a[n-i-1]=t;
}

```



Without using 3rd variable:

The screenshot shows a Microsoft Windows desktop environment. In the foreground, there is a window titled "TC" which is a copy of the classic Turbo C++ integrated development environment. The window has a menu bar with options: File, Edit, Run, Compile, Project, Options, and Debug. Below the menu bar, it displays "Line 12" and "Col 50". The main code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    for(i=0; i<n/2; i++)
    {
        a[i] = a[i] + a[n-i-1];
        a[n-i-1] = a[i] - a[n-i-1];
        a[i] = a[i] - a[n-i-1];
    }
    puts("In reverse order ");
    for(i=0; i<n; i++) printf("%4d", a[i]);
    getch();
}
```

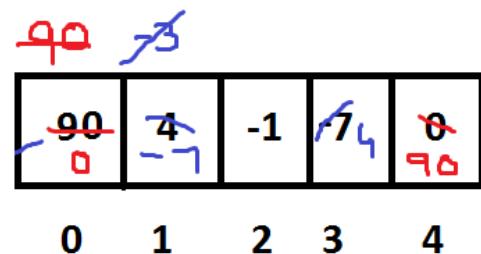
The status bar at the bottom of the window shows various icons and the system time: "10:31 AM 27-Nov-24". The taskbar at the bottom of the screen also displays several application icons, including Windows, File Explorer, Task View, Control Panel, ZM, Google Chrome, File Explorer, Paint, Task View, Task Manager, and File Explorer.

```
TC
Enter array size 1-100 5
Enter 5 elements 1 2 3 4 5
In reverse order
5 4 3 2 1
```

$$a[0]=a[0]+a[4]==>90+0=90$$

$$a[4]=a[0]-a[4]==>90-0=90$$

$$a[0]=a[0]-a[4]==>90-90=0$$



$$a[1]=a[1]+a[3]==>4+-7=-3$$

$$a[3]=a[1]-a[3]==>-3--7=4$$

$$a[1]=a[1]-a[3]==>-3-4=-7$$

Linear search:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status information shows "Line 15" and "Col 36". The main code area contains the following C program:

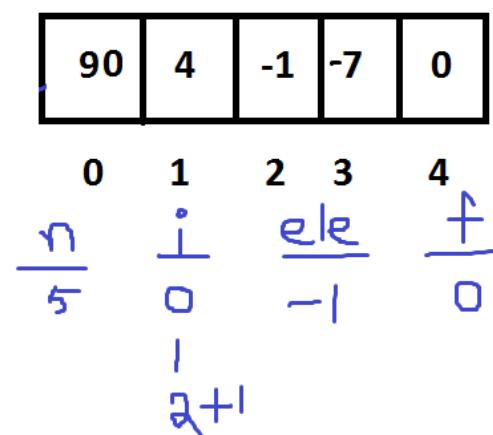
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, ele, f=0;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    printf("Enter element to search "); scanf("%d", &ele);
    for(i=0; i<n; i++)
    {
        if(a[i]==ele) printf("%d in %d cell\n", ele, i+1, f=1);
    }
    if(f==0) printf("%d not found", ele);
    getch();
}
```

The taskbar at the bottom of the screen displays several icons, including the Start button, File Explorer, Task View, Calculator, Dev, Zoom, Switch, Trace, Stop, Make, and Run buttons. The system tray shows the date and time as "10:41 AM 27-Nov-24".

```
TC
Enter array size 1-100 9
Enter 9 elements 1 2 3 2 6 7 2 9 -1
Enter element to search 2
2 in 2 cell
2 in 4 cell
2 in 7 cell
```

```
TC
Enter array size 1-100 5
Enter 5 elements 1 2 3 4 5
Enter element to search 9
9 not found_
```

```
for( i=0; i<5; i++)
{
if(a[i]==ele)
p("%d in %d cell\n",ele,i+1,f=1);
}
if(f==0)p(ele not found);
```



Printing Index no:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 13 Col 47". The main code area contains the following C program:

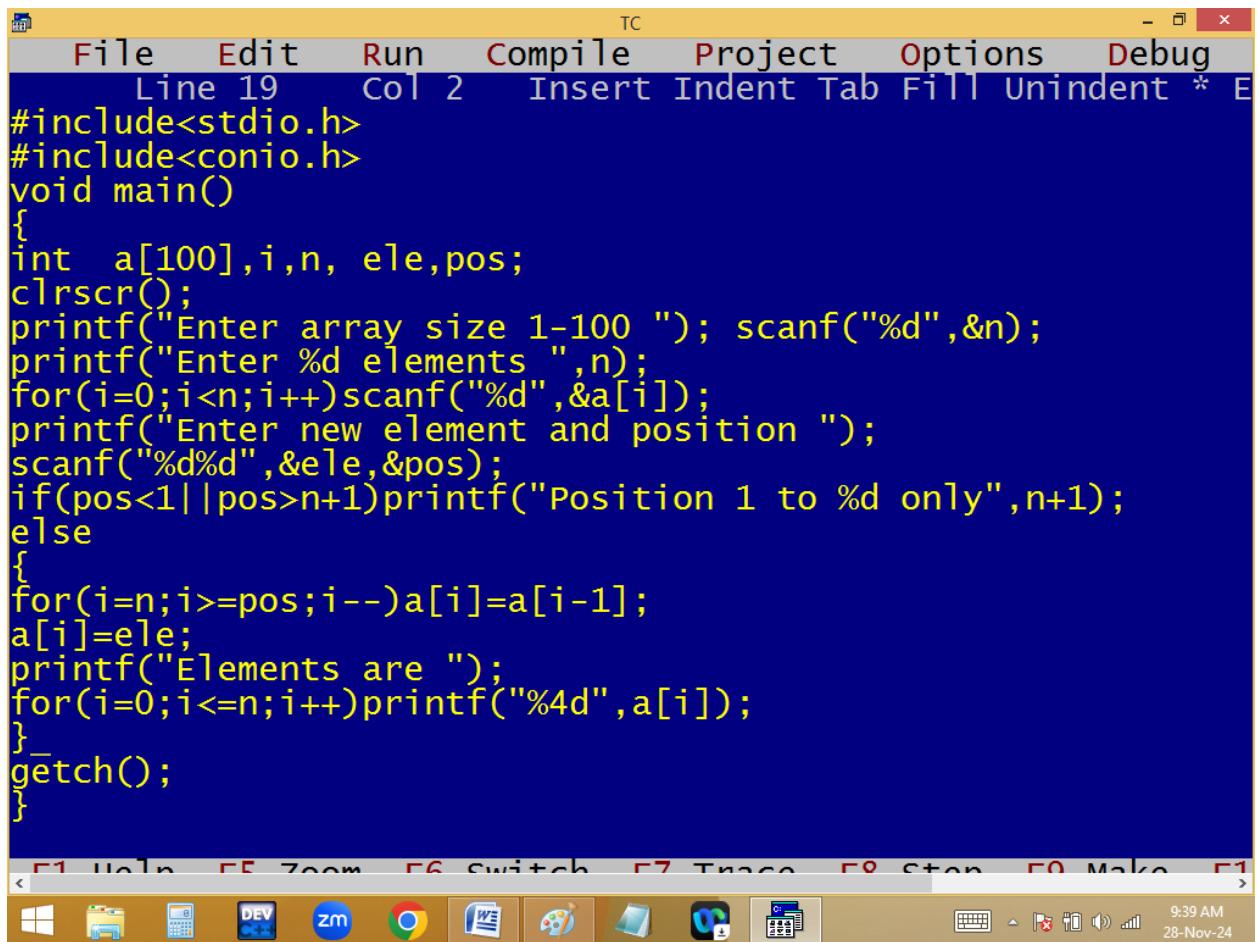
```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, ele, f=0;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    printf("Enter element to search "); scanf("%d", &ele);
    for(i=0; i<n; i++)
    {
        if(a[i]==ele) printf("%d in a[%d] cell\n", ele, i, f=1);
    }
    if(f==0) printf("%d not found", ele);
    getch();
}
```

The taskbar at the bottom of the screen displays several icons, including the Start button, File Explorer, Task View, Calculator, Dev, Zoom, Switch, Trace, Stop, Make, and Run buttons. The system tray shows the date and time as "10:44 AM 27-Nov-24".

```
TC
Enter array size 1-100 9
Enter 9 elements 1 2 3 4 1 7 8 1 9
Enter element to search 1
1 in a[0] cell
1 in a[4] cell
1 in a[7] cell
```



Inserting a new element in specified position of array [right shifting of array elements [push]]



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom displays various icons and the date/time: 9:39 AM, 28-Nov-24.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, ele, pos;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    printf("Enter new element and position ");
    scanf("%d%d", &ele, &pos);
    if(pos<1 || pos>n+1) printf("Position 1 to %d only", n+1);
    else
    {
        for(i=n; i>=pos; i--) a[i]=a[i-1];
        a[i]=ele;
        printf("Elements are ");
        for(i=0; i<=n; i++) printf("%4d", a[i]);
    }
    getch();
}
```

```
TC
Enter array size 1-100 3
Enter 3 elements 1 2 3
Enter new element and position 9 9
Position 1 to 4 only_
```



```
TC
Enter array size 1-100 5
Enter 5 elements 2 0 1 5 3
Enter new element and position 7 7
Position 1 to 6 only_
```

```
TC
Enter array size 1-100 3
Enter 3 elements 1 2 3
Enter new element and position 0 0
Position 1 to 4 only_
```



```
TC
Enter array size 1-100 3
Enter 3 elements 1 2 3
Enter new element and position 4 4
Elements are    1    2    3    4_
```

```
TC
Enter array size 1-100 3
Enter 3 elements 1 0 2
Enter new element and position 9 1
Elements are      9    1    0    2_
```



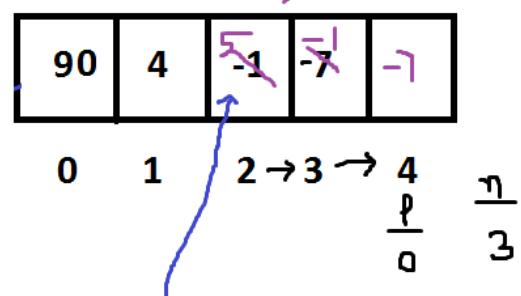
```

TC
Enter array size 1-100 4
Enter 4 elements 1 2 4 5
Enter new element and position 3 3
Elements are 1 2 3 4 5_

```

Right shifting of array elements [push]

$i >= 3$
 $3 >= 3$
 $i = 4 >= 3$
 \downarrow
for(i=n; i>=pos;i--) a[i]=a[i-1];
 \downarrow
 $i >= 9$
 $a[i]=newele;$
 $i = 5$
 $3 = 9$
 $2 \rightarrow 3 >= 6$
 $1 \rightarrow 2 >= 5$
 $0 \rightarrow 1 >= 0$
 $-1 \quad 0 = 0$



newele = 5 pos=3 cell

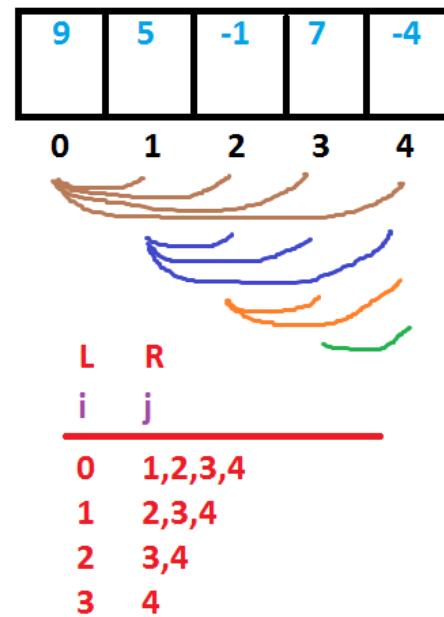
without damaging -1

Sorting: Arranging data in a order

Selection sort:

Selection sort in ascending order:

9	5	-1	7	-4
5	9	-1	7	-4
-1	9	5	7	-4
-4	9	5	7	-1
-4	5	9	7	-1
-4	-1	9	7	5
-4	-1	7	9	5
-4	-1	5	9	7
-4	-1	5	7	9



The screenshot shows a Microsoft Windows desktop environment. In the foreground, there is a window titled "TC" which is a copy of the classic Turbo C++ integrated development environment. The window has a menu bar with options: File, Edit, Run, Compile, Project, Options, and Debug. Below the menu bar, it displays "Line 19" and "Col 1". The main code editor area contains C code for bubble sorting an array. The code includes #include directives for stdio.h and conio.h, a main function that prompts for array size and elements, sorts them using nested loops, and prints the sorted elements. The code ends with a getch() call. At the bottom of the window, there is a toolbar with various icons and a status bar showing "10:02 AM 28-Nov-24". The taskbar at the bottom of the screen shows icons for the Start button, File Explorer, Task View, Task Switcher, Zoom, Switch, Trace, Stop, Make, and a folder. The system tray on the right side of the taskbar shows icons for battery, signal strength, volume, and date/time.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100],i,n,j,t;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d",&n);
    printf("Enter %d elements ",n);
    for(i=0;i<n;i++)scanf("%d",&a[i]);
    for(i=0;i<=n-2;i++)
    {
        for(j=i+1;j<=n-1;j++)
        {
            if(a[i]>a[j]){t=a[i];a[i]=a[j];a[j]=t;}
        }
    }
    printf("Elements are ");
    for(i=0;i<n;i++)printf("%4d",a[i]);
    getch();
}
```

```

TC
Enter array size 1-100 9
Enter 9 elements 3 0 8 -2 7 3 -5 9 4
Elements are   -5   -2   0   3   3   4   7   8   9

```

```

for( i=0; i<=n-2;i++)
{
  for( j=i+1; j<=n-1;j++)
  { L R
    if(a[i]>a[ j])
    {
      t=a[i];
      a[i]=a[j];
      a[j]=t;
    }
  }
}

```

$$\frac{n}{5}$$



L	R
i	j
0	1,2,3,4
1	2,3,4
2	3,4
3	4
	T

Descending order:

TC

File Edit Run Compile Project Options Debug

Line 14 Col 9 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],i,n,j,t;
clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<=n-2;i++)
{
for(j=i+1;j<=n-1;j++)
{
if(a[i]<a[j]){t=a[i];a[i]=a[j];a[j]=t;}
}
}
printf("Elements are ");
for(i=0;i<n;i++)printf("%4d",a[i]);
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10



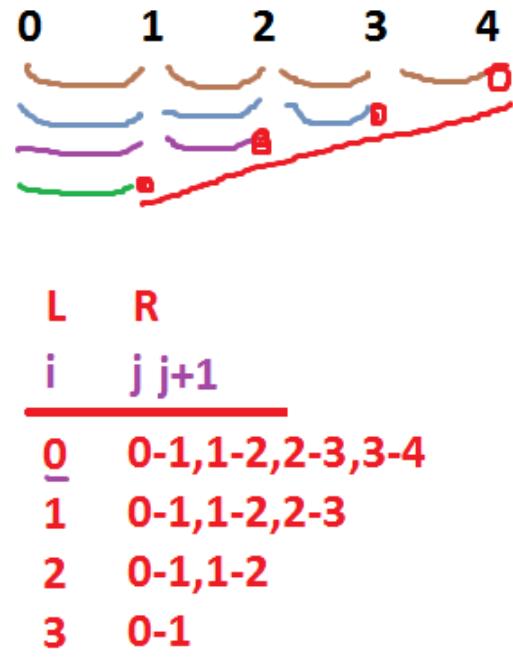
10:04 AM
28-Nov-24

```
TC
Enter array size 1-100 7
Enter 7 elements 3 9 0 3 -5 1 -7 4
Elements are      9   3   3   1   0   -5   -7
```



Bubble sort in ascending order:

9	5	-1	7	-4
5	9	-1	7	-4
5	-1	9	7	-4
5	-1	7	9	-4
5	-1	7	-4	9
-1	5	7	-4	9
-1	5	-4	7	9
-1	-4	5	7	9
-4	-1	5	7	9



TC

File Edit Run Compile Project Options Debug

Line 14 Col 41 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],i,n,j,t;
clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<=n-2;i++)
{
for(j=0;j<=n-i-2;j++)
{
if(a[j]>a[j+1]){t=a[j];a[j]=a[j+1];a[j+1]=t;}
}
}
printf("Elements are ");
for(i=0;i<n;i++)printf("%4d",a[i]);
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10



10:24 AM
28-Nov-24

```
TC
Enter array size 1-100 9
Enter 9 elements 1 9 0 3 9 -3 7 -1 4
Elements are   -3  -1  0  1  3  4  7  9  9_
```



Descending order:

TC

File Edit Run Compile Project Options Debug

Line 14 Col 9 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],i,n,j,t;
clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<=n-2;i++)
{
for(j=0;j<=n-i-2;j++)
{
if(a[j]<a[j+1]){t=a[j];a[j]=a[j+1];a[j+1]=t;}
}
}
printf("Elements are ");
for(i=0;i<n;i++)printf("%4d",a[i]);
getch();
}
```

F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10



10:25 AM
28-Nov-24

```

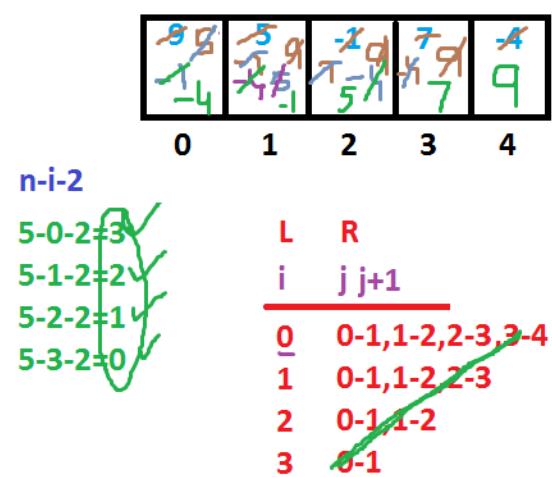
TC
Enter array size 1-100 8
Enter 8 elements 3 0 1 9 -3 7 -4 3
Elements are      9   7   3   3   1   0   -3   -4

```

```

for( i=0; i<=n-2;i++)
{
    for( j=0;j<=n-i-2;j++)
    {
        L     R
        if(a[j]>a[j+1])
        {
            t=a[j];a[j]=a[j+1];
            a[j+1]=t;
        }
    }
}

```



Sort even elements in ascending and odd elements in descending order:

The screenshot shows a Microsoft Windows desktop environment. In the foreground, there is a code editor window titled "TC" (Turbo C++) with the following code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100], i, n, j, t;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    for(i=0; i<=n-2; i++)
    {
        for(j=0; j<=n-i-2; j++)
        {
            if(a[j]>a[j+1]) {t=a[j]; a[j]=a[j+1]; a[j+1]=t;}
        }
    }
    printf("Even Elements are ");
    for(i=0; i<n; i++) if(a[i]%2==0) printf("%4d", a[i]);
    printf("\nOdd Elements are ");
    for(i=n-1; i>=0; i--) if(a[i]%2!=0) printf("%4d", a[i]);
    getch();
}
```

The status bar at the bottom of the code editor shows the following information: F1 Help, F5 Zoom, F6 Switch, F7 Trace, F8 Stop, F9 Make, F10, and the date/time 10:32 AM 28-Nov-24.

```
TC
Enter array size 1-100 9
Enter 9 elements 1 2 3 4 5 6 7 8 9
Even Elements are    2    4    6    8
Odd Elements are     9    7    5    3    1_
```



```
TC
Enter array size 1-100 9
Enter 9 elements 3 0 9 -2 7 4 8 -5 1
Even Elements are -2 0 4 8
Odd Elements are 9 7 3 1 -5
```

Arrange half array elements in ascending and remaining descending:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler (TC). The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. Below the menu bar, it displays Line 19, Col 14, Insert, Indent, Tab, Fill, Unindent, and E. The main code area contains the following C program:

```
void main()
{
int a[100],i,n,j,t;
clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<=n-2;i++)
{
for(j=0;j<=n-i-2;j++)
{
if(a[j]>a[j+1]){t=a[j];a[j]=a[j+1];a[j+1]=t;}
}
}
printf("Elements are ");
for(i=0;i<n/2;i++)printf("%4d",a[i]);
for(i=n-1;i>=n/2;i--)printf("%4d",a[i]);
getch();
}
```

The status bar at the bottom shows various icons for system tasks like Help, Zoom, Switch, Trace, Stop, Make, and Run. On the far right of the status bar, it shows the date and time: 10:35 AM 28-Nov-24.

```
TC
Enter array size 1-100 8
Enter 8 elements 1 2 3 4 5 6 7 8
Elements are    1   2   3   4   8   7   6   5_
```

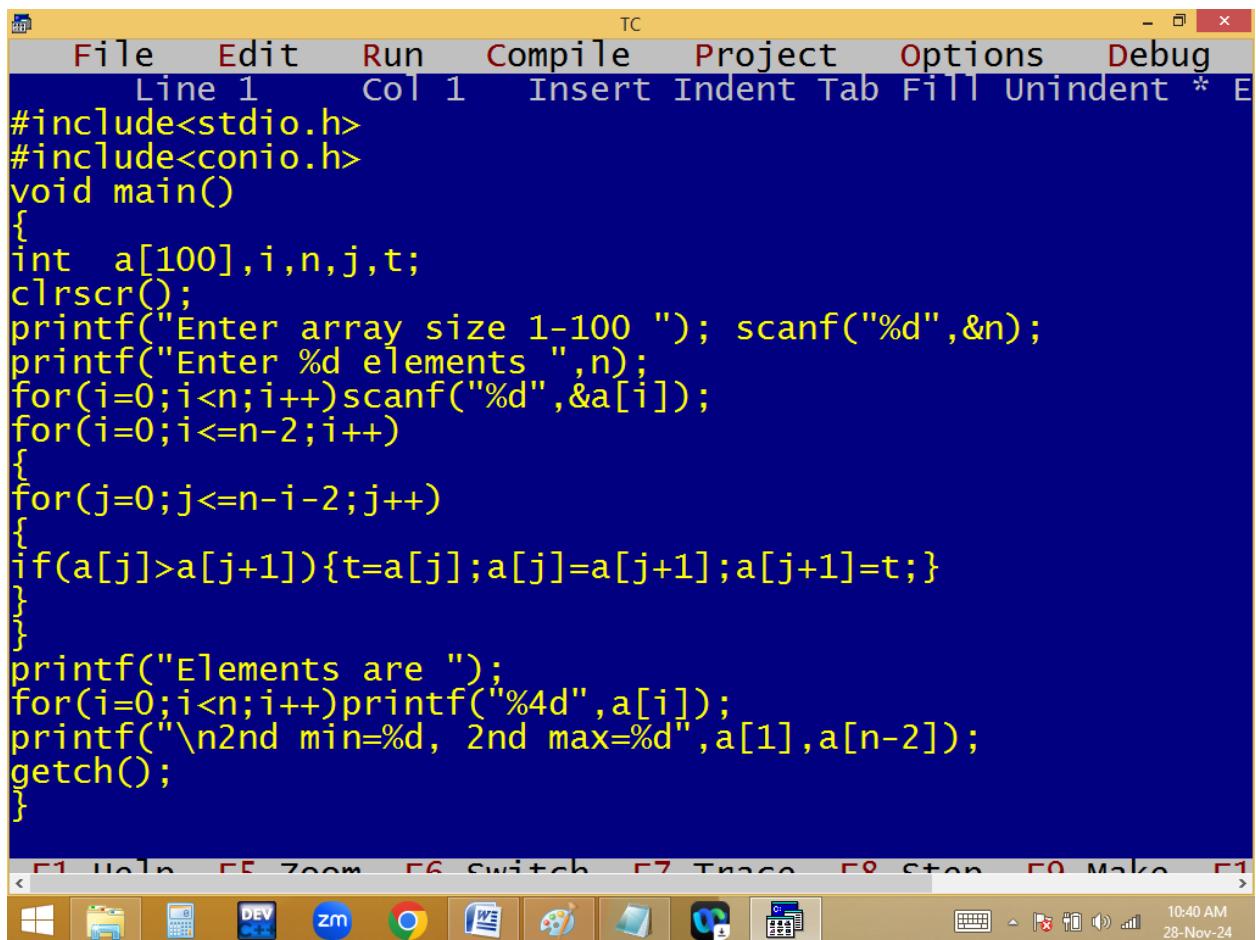


10:35 AM
28-Nov-24

The screenshot shows a Windows desktop environment. At the top is a taskbar with various icons. Below it is a command-line window titled "TC". The window displays the following text:
Enter array size 1-100 9
Enter 9 elements 2 0 7 5 -2 6 4 1 7
Elements are -2 0 1 2 7 7 6 5 4

Find the 2nd max and 2nd min array elements:

```
TC
File Edit Run Compile Project Options Debug
Line 1 Col 1 Insert Indent Tab Fill Unindent * E
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],i,n,j,t;
clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<=n-2;i++)
{
for(j=0;j<=n-i-2;j++)
{
if(a[j]>a[j+1]){t=a[j];a[j]=a[j+1];a[j+1]=t;}
}
}
printf("Elements are ");
for(i=0;i<n;i++)printf("%4d",a[i]);
printf("\n2nd min=%d, 2nd max=%d",a[1],a[n-2]);
getch();
}
```



```
TC
Enter array size 1-100 7
Enter 7 elements 6 0 2 0 7 5 7
Elements are    0    0    2    5    6    7    7
2nd min=0, 2nd max=7_
```



Finding 2nd max, 2nd min elements of array:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, status text indicates "Line 2 Col 19 Insert Indent Tab Fill Unindent * E". The main code area contains C code for finding the second minimum and maximum values in an array. The code uses `#include <stdio.h>` and `#include <conio.h>`. It initializes an array `a[100]` and reads user input for its size `n` and elements. It then iterates through the array to find the second minimum and maximum values. The code ends with a call to `getch()`. The status bar at the bottom shows various icons and the system time "9:35 AM 29-Nov-24".

```
#include<stdio.h> #include<conio.h>
void main()
{
    int a[100], i, n, j, t; clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    for(i=0; i<=n-2; i++)
    {
        for(j=0; j<=n-i-2; j++)
        {
            if(a[j]>a[j+1]) {t=a[j]; a[j]=a[j+1]; a[j+1]=t;}
        }
    }
    printf("Elements are ");
    for(i=0; i<n; i++) printf("%4d", a[i]);
    for(i=1; i<n; i++)
    {
        if(a[i]>a[0]) {printf("\n2nd min=%d\n", a[i]); break;}
    }
    for(i=n-2; i>=0; i--)
    {
        if(a[i]<a[n-1]) {printf("2nd max=%d", a[i]); break;}
    }
    getch();
}
```

```
TC
Enter array size 1-100 9
Enter 9 elements 5 0 4 -1 7 3 9 1 -1
Elements are    -1   -1   0   1   3   3   4   5   7   9
2nd min=0
2nd max=7
```



```
TC
Enter array size 1-100 7
Enter 7 elements 2 0 1 5 0 6 6
Elements are      0 0 1 2 5 6 6
2nd min=1
2nd max=5
```

```
for( i=1; i<5;i++ )
{
if( a[i]>a[0])p("2nd
min=%d",a[i]);break;
}
for( i=n-2; i>=0; i-- )
{
if(a[i]<a[n-1])p("2nd max=a[i]);break;
}
```

1 i
5 3
2

1 1 4 8 8
1 0 1 2 3 4
1 4

Find the nth max, nth min array elements.

```
#include<stdio.h>

#include<conio.h>

void main()

{

int a[100],i,n,j,t,max, min; clrscr();

printf("Enter array size 1-100 "); scanf("%d",&n);

printf("Enter %d elements ",n);

for(i=0;i<n;i++)scanf("%d",&a[i]);

for(i=0;i<=n-2;i++)

{

for(j=0;j<=n-i-2;j++)

{

if(a[j]>a[j+1]) {t=a[j];a[j]=a[j+1];a[j+1]=t;}

}

printf("Elements are ");

for(i=0;i<n;i++)printf("%4d",a[i]);
```

```
printf("\nEnter nth min, nth max values ");

scanf("%d%d",&min,&max);

for(i=1;i<n;i++)

{if(a[i]>a[i-1])

{min--;if(min==1){printf("\nmin=%d\n",a[i]);break;}}

for(i=n-2;i>=0;i--)

{if(a[i]<a[i+1])

{max--;if(max==1){printf("max=%d",a[i]);break;}}}

getch();

}
```

```
TC
Enter array size 1-100 9
Enter 9 elements 1 2 3 4 5 6 7 8 9
Elements are   1   2   3   4   5   6   7   8   9
Enter nth min, nth max values 4 7

min=4
max=3_
```



```

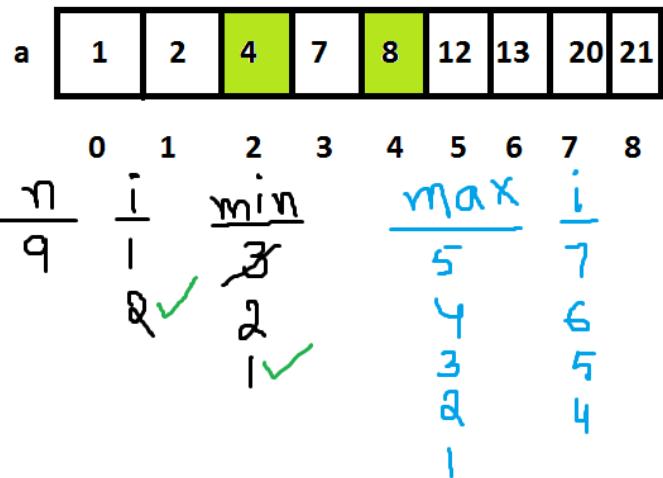
TC
Enter array size 1-100 12
Enter 12 elements
5 0 8 -2 7 1 6 10 24 11 4 2
Elements are -2 0 1 2 4 5 6 7 8 10 11 24
Enter nth min, nth max values 8 3
min=7
max=10_

```

```

for( i=1;i<n;i++)
{
    if(a[i]>a[i-1])min--;
    if(min==1)p("3rd min=%d",a[i]);break;
}
for( i=n-2;i>=0;i--)
{
    if(a[i]<a[i+1])max--;
    if(max==1)p("5thmax=%d",a[i]);break;
}

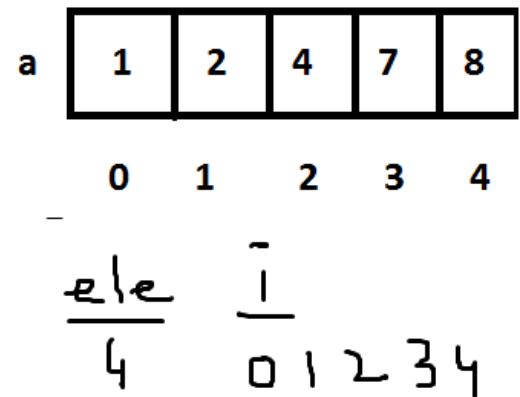
```



Deleting array element:

1. Skipping

```
for( i=0 ;i<n;i++ )  
    if(a[i] != ele) p(a[i]);  1 2 7 8
```



The screenshot shows a Windows desktop environment with a code editor window for Turbo C++ (TC) running in the foreground. The window has a menu bar with File, Edit, Run, Compile, Project, Options, Debug, Line 14, Col 19, Insert, Indent, Tab, Fill, Unindent, and Exit. The main area contains C code for deleting an element from an array. The status bar at the bottom shows various icons and the system time (10:04 AM) and date (29-Nov-24).

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100],i,n,ele,f=0;
    clrscr();
    printf("Enter array size 1-100 "); scanf("%d",&n);
    printf("Enter %d elements ",n);
    for(i=0;i<n;i++)scanf("%d",&a[i]);
    printf("Enter the element to delete ");
    scanf("%d",&ele);
    printf("Elements are ");
    for(i=0;i<n;i++)if(a[i]==ele)f=1;else printf("%4d",a[i]);
    if(f==0)printf("\n%d not found",ele);
    getch();
}
```

```
TC
Enter array size 1-100 3
Enter 3 elements 1 2 3
Enter the element to delete 4
Elements are    1    2    3
4 not found_
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying a program's output. The program prompts for an array size (3), enters three elements (1, 2, 3), asks for an element to delete (4), and then outputs the elements (1, 2, 3) followed by a message '4 not found_'. Below the terminal is a standard Windows taskbar with pinned icons for File Explorer, Task View, Start, Task Manager, and other applications like DEV, zm, Google Chrome, Microsoft Word, Paint, and File Explorer again. The system tray shows the date and time as 10:04 AM on 29-Nov-24.

The screenshot shows a Windows desktop environment. In the center is a Command Prompt window titled "TC". The window contains the following text:

```
Enter array size 1-100 7
Enter 7 elements 1 2 3 4 1 5 1
Enter the element to delete 1
Elements are      2      3      4      5
```

The desktop taskbar at the bottom shows several pinned icons, including File Explorer, Task View, Start, Task Manager, ZM, Google Chrome, Microsoft Word, Paint, File Cabinet, and Task Scheduler. The system tray indicates the date and time as 10:04 AM on 29-Nov-24.

2. Permanent deletion [left shifting or array elements [pop] :

The screenshot shows a Microsoft Windows desktop environment. In the foreground, there is a code editor window titled "TC" (Turbo C++) with the following code:

```
#include<stdio.h> #include<conio.h>
void main()
{
    int a[100], i, n, ele, f=0, j; clrscr();
    printf("Enter array size 1-100 "); scanf("%d", &n);
    printf("Enter %d elements ", n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    printf("Enter the element to delete ");
    scanf("%d", &ele);
    for(i=0; i<n; i++)
    {
        if(a[i]==ele)
        {
            for(n--, f=1, j=i; j<n; j++) a[j]=a[j+1]; i--;
        }
    }
    if(f==0) printf("%d not found", ele);
    else{
        printf("Elements are ");
        for(i=0; i<n; i++) printf("%4d", a[i]);
    }
    getch();
}
```

The status bar at the bottom of the code editor shows the following information: F1 Help, F5 Zoom, F6 Switch, F7 Trace, F8 Stop, F9 Make, F10, 10:28 AM, and 29-Nov-24.

The taskbar at the bottom of the screen contains icons for various applications, including File Explorer, Task View, Calculator, Dev, ZM, Google Chrome, File Explorer again, Paint, Task View again, and File Explorer once more. The system tray shows the date and time as 10:28 AM on 29-Nov-24.

```
TC
Enter array size 1-100 5
Enter 5 elements 1 1 1 1 1
Enter the element to delete 1
Elements are _
```

```
TC
Enter array size 1-100 7
Enter 7 elements 1 8 3 9 2 1 6
Enter the element to delete 1
Elements are     8      3      9      2      6_
```



```

TC
Enter array size 1-100 3
Enter 3 elements 1 2 3
Enter the element to delete 7
7 not found_

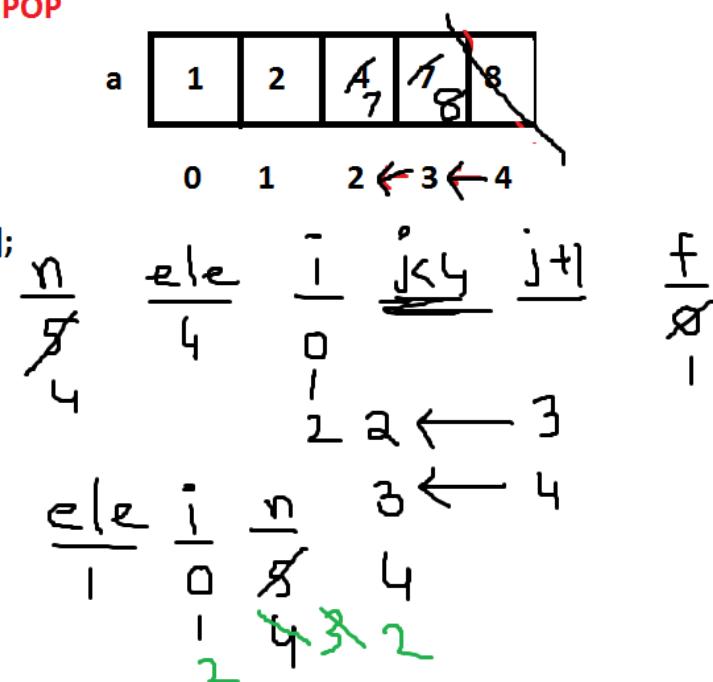
```

Left shifting of array elements/ POP

```

for( i=0;i<n;i++)
    if(a[i]==ele)
    {
        for(n--,f=1,j=i; j<n;j++) a[j]=a[j+1];
    }

```



Deleting duplicate elements from array:

```
TC
File Edit Run Compile Project Options Debug
Line 1 Col 13 Insert Indent Tab Fill Unindent * E
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],i,j,k,n; clrscr();
printf("Enter array size 1-100 "); scanf("%d",&n);
printf("Enter %d elements ",n);
for(i=0;i<n;i++)scanf("%d",&a[i]);
for(i=0;i<n;i++)
{
for(j=i+1;j<n;j++)
{
if(a[i]==a[j])
{
for(n--,k=j;k<n;k++)a[k]=a[k+1];j--;
}
}
}
printf("Elements are ");
for(i=0;i<n;i++)printf("%4d",a[i]);
getch();
}
```

10:40 AM
29-Nov-24

```
TC
Enter array size 1-100 9
Enter 9 elements 1 2 3 1 2 4 1 2 3
Elements are    1   2   3   4_
```

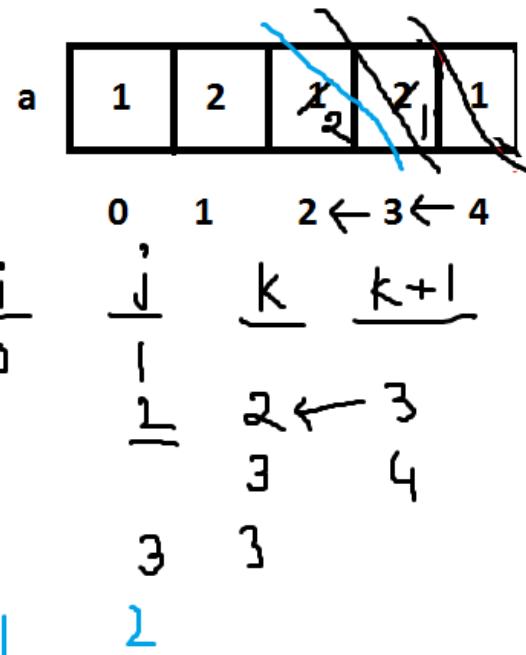


10:40 AM
29-Nov-24

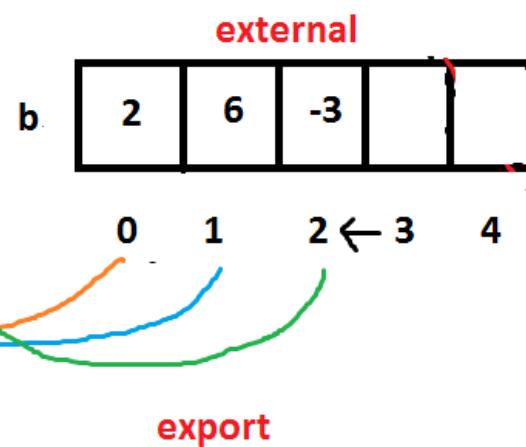
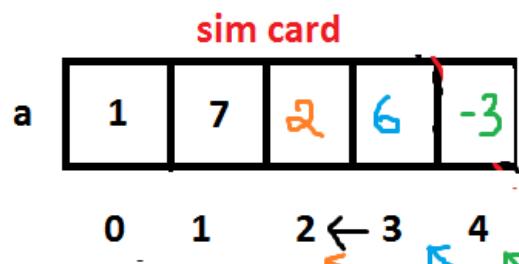
```

for( i=0; i<n; i++)
{
  for( j=i+1; j<n; j++)
  {
    if(a[i]==a[j])
    {
      for(n--, k=j ; k<n; k++) a[k]=a[k+1];
    }
  }
}

```



Merging of arrays:



Merging of arrays:

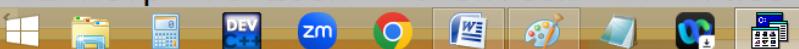
TC

File Edit Run Compile Project Options Debug

Line 2 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[100],b[100],i,s1,s2,j; clrscr();
printf("Enter 1st array, 2nd array size 1-100 ");
scanf("%d%d",&s1,&s2);
printf("Enter %d elements for 1st array ",s1);
for(i=0;i<s1;i++)scanf("%d",&a[i]);
printf("Enter %d elements for 2nd array ",s2);
for(i=0;i<s2;i++)scanf("%d",&b[i]);
for(i=s1,j=0;i<s1+s2;i++,j++)a[i]=b[j];
for(i=0;i<=s1+s2-2;i++)
{
for(j=i+1;j<=s1+s2-1;j++)
{
if(a[i]>a[j]){int t=a[i];a[i]=a[j];a[j]=t;}}
}
printf("Elements are ");
for(i=0;i<s1+s2;i++)printf("%4d",a[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

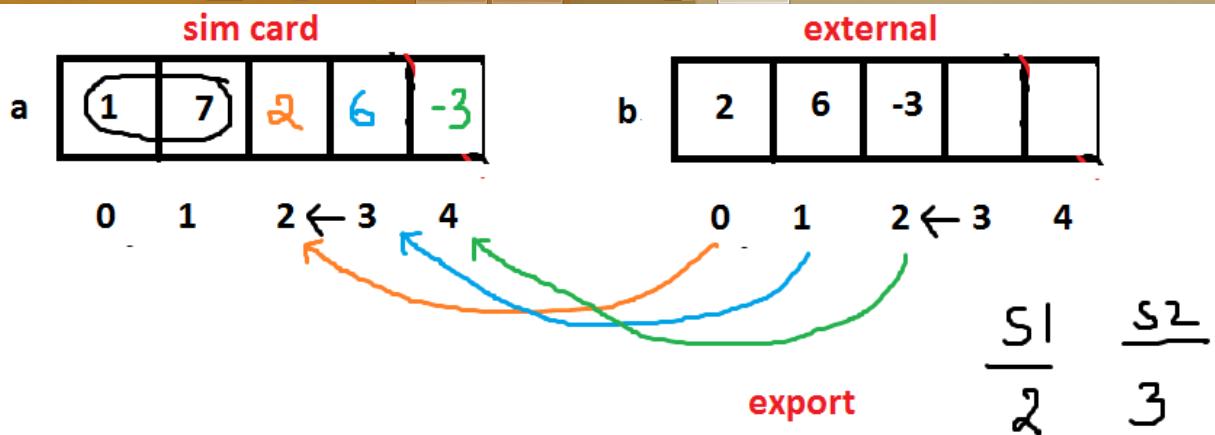


9:30 AM >
30-Nov-24

```

TC
Enter 1st array, 2nd array size 1-100 5 7
Enter 5 elements for 1st array 3 0 5 -2 8
Enter 7 elements for 2nd array 4 9 1 6 -5 8 -1
Elements are   -5   -2   -1   0   1   3   4   5   6   8   8   9

```



```
for( i=s1,j=0; i<s1+s2; i++,j++) s1[i]=s2[j];
```

$\frac{i}{2 \leftarrow 0}$ 3 4 5	$\frac{j}{1}$ 1 2
---	-------------------------

Frequency of array elements:

The screenshot shows a Microsoft Windows desktop environment. In the foreground, a window for the Turbo C++ compiler is open. The title bar reads "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu, status information shows "Line 6" and "Col 1". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[100],b[100]={0},n,i,j,c;
    clrscr();
    printf("Enter array size 1-100 ");scanf("%d",&n);
    printf("Enter %d elements ",n);
    for(i=0;i<n;i++)scanf("%d",&a[i]);
    for(i=0;i<n;i++)
    {
        if(b[i]!=-1)
        {
            for(j=i+1;j<n;j++)
            {
                if(a[i]==a[j]) {c++; b[j]=-1;}
            }
            b[i]=c;
        }
    }
    for(i=0;i<n;i++)if(b[i]!=-1)
    printf("%d found %d times\n",a[i],b[i]);
    getch();
}
```

The taskbar at the bottom of the screen displays various pinned icons, including the Start button, File Explorer, Task View, Calculator, DEV, Zoom (zm), Google Chrome, File Explorer (WE), Paint, File Explorer (F), and Task View (T). The system tray shows the date and time as "9:55 AM 30-Nov-24".

TC

```

Enter array size 1-100 8
Enter 8 elements 1 7 1 2 3 2 1 7
1 found 3 times
7 found 2 times
2 found 2 times
3 found 1 times

```

Page: 4 of 5 Words: 7

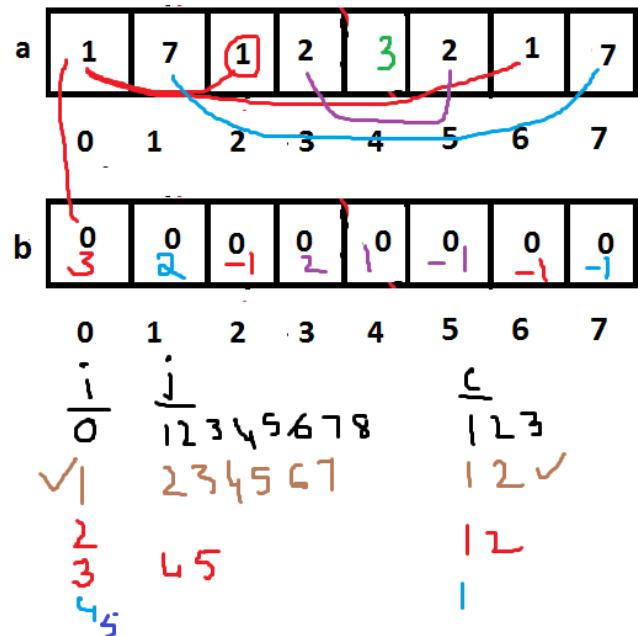
9:55 AM
30-Nov-24

```

for( i=0; i<n;i++)
{
    if(b[i]!=-1)
        for(c=1, j=i+1;j<n;j++)
        {
            if(a[i]==a[j]) {c++;b[j]=-1;}
        }
    b[i]=c;
}
for(i=0;i<n;i++)if(b[i]!=-1)
    p("%d found %d times\n",a[i],b[i]);

```

$\frac{1}{0}$
 $\frac{7}{1}$
 $\frac{1}{3}$
 $\frac{2}{4}$



Two dimensional arrays:

Array with several rows and columns.

Array with two subscripting operators [][].

It is array of arrays. i.e. collection of one-dimensional arrays.

It is implicit double pointer.

It is a n*n matrix.

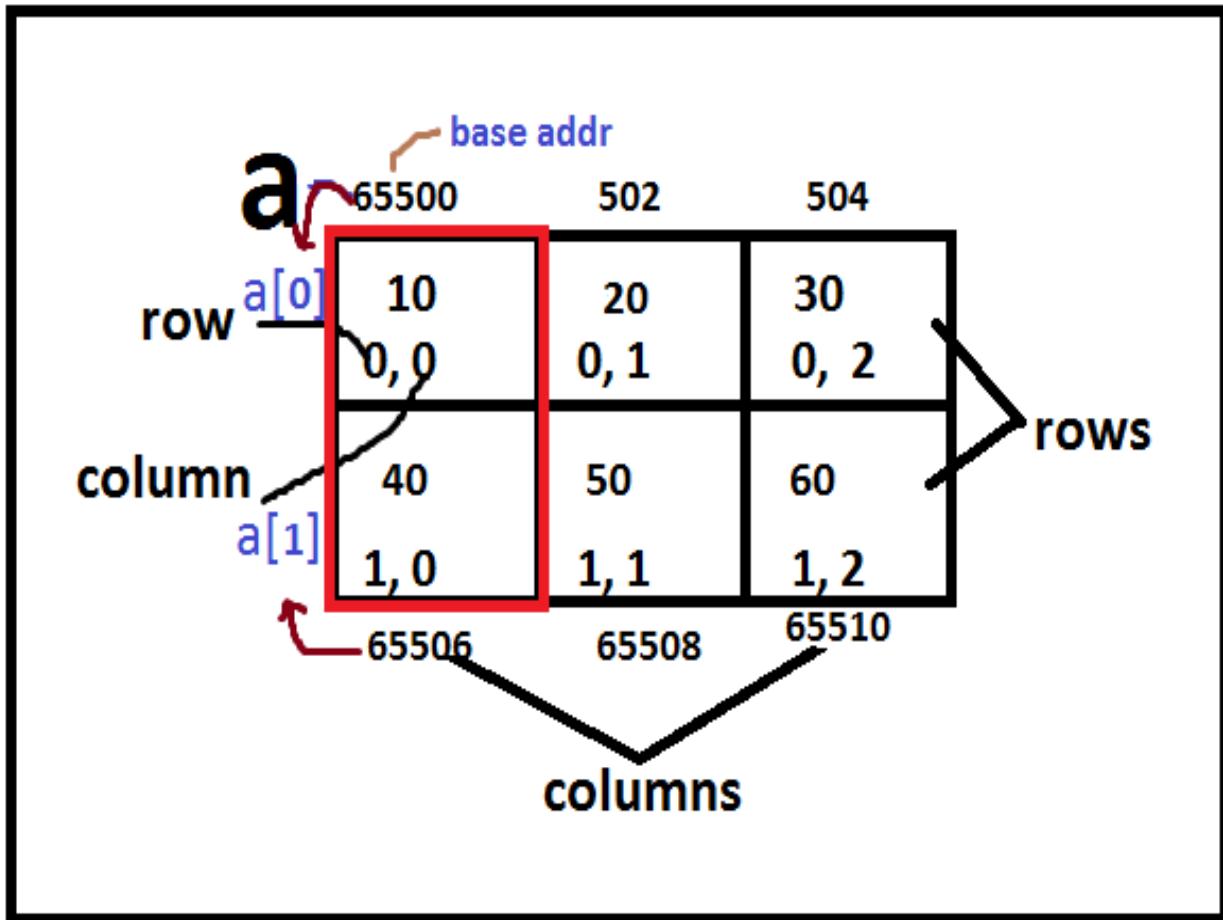
Syntax:

datatype variable [rows] [columns] = {elements} ;

Eg:

```
int a[ 2 ][ 3 ] = { { 10, 20 , 30 } , { 40 ,50, 60 } };
```

stack



In two dimensional array the rows/first subscript is working as array of pointers and they stores first column address of each row. Hence it is an implicit/internal double pointer.

In the above example, To print the first row, first column value, we have to use

`printf("%d", a[0][0]);` → 10

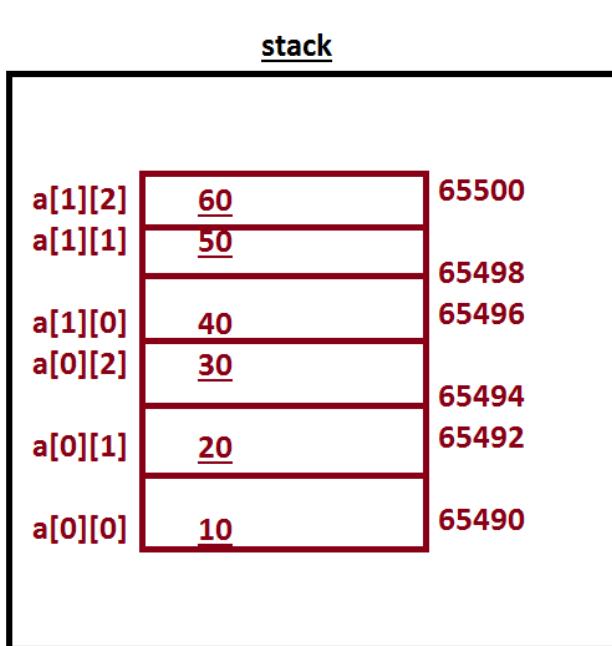
Internally how this statement is working ?

a[0] means value at a[0] i.e. 65500.

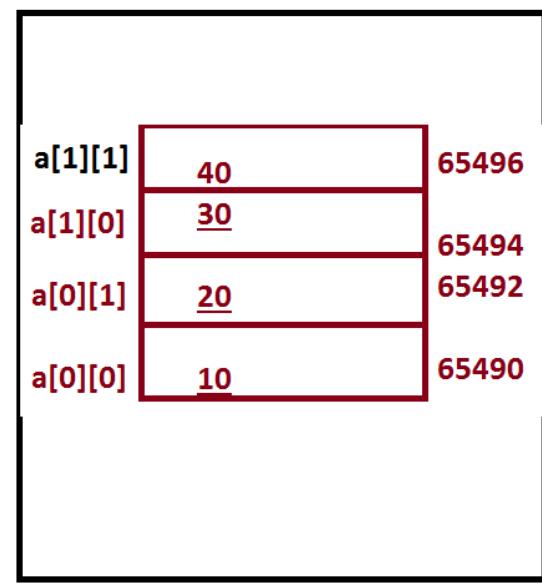
65500 + [0] col → 65500 + 0 * 2 → 65500 →
value at 65500 is 10.

Index no

Int size

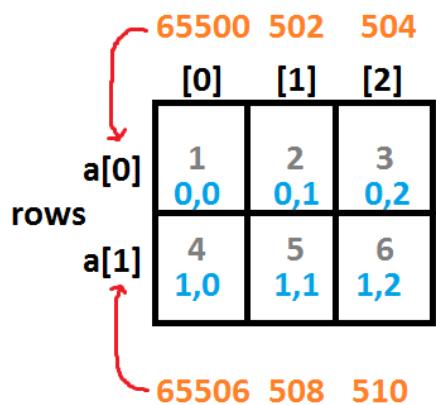


`int a[2][2]={10,20,30,40};`



```
int a[2][3]={ {1,2,3}, {4,5,6} };
```

columns



p("%d", a[0][0]); ==> 1

$65500 + 0 * 2 = 65500 \Rightarrow \text{value at } 65500 \Rightarrow 1$

p("%d", a[1][2]); ==> 6

$65506 + 2 * 2 = 65510 \Rightarrow \text{value at } 65510 \Rightarrow 6$

stack

a[1][2]	6	65510
a[1][1]	5	65508
a[1][0]	4	65506
a[0][2]	3	65504
a[0][1]	2	65502
a[0][0]	1	65500

Finding address of 2d array:

TC

File Edit Run Compile Project Options Debug

Line 9 Col 2 Insert Indent Tab Fill Unindent *

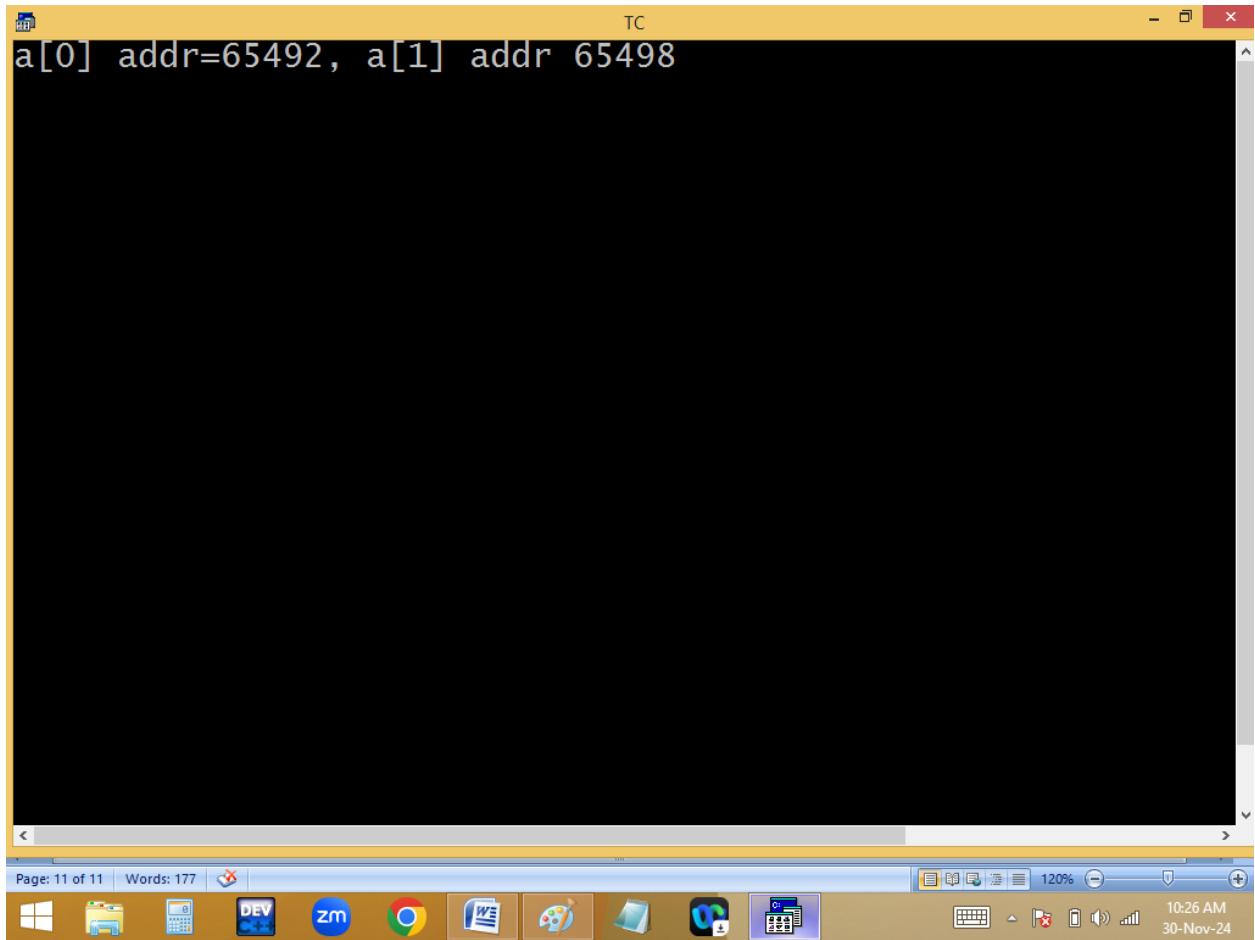
```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3},{4,5,6}};
clrscr();
printf("a[0] addr=%u, a[1] addr %u",a[0],a[1]);
getch();
}
```

Page: 11 of 11 Words: 177

120% 10:26 AM 30-Nov-24



The screenshot shows a Microsoft Windows desktop environment. A code editor window titled 'TC' is open, displaying C code. The code includes #include directives for stdio.h and conio.h, a main function that declares a 2x3 integer array 'a', prints its memory addresses, and waits for input. The taskbar at the bottom shows various pinned application icons: File Explorer, Task View, Calculator, DEV (DevOps), zm (Zoom), Google Chrome, File Explorer again, Paint, File Explorer again, and File Explorer again. The system tray shows the date and time as 10:26 AM on November 30, 2024.



Finding array cell no, element and address:

TC

File Edit Run Compile Project Options Debug

Line 8 Col 19 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3},{4,5,6}},r,c;
clrscr();
for(r=0;r<2;r++)for(c=0;c<3;c++)
printf("a[%d][%d]addr=%u,value %d\n",r,c,&a[r][c],a[r][c]);
getch();
}
```

Page: 13 of 13 Words: 177

120%

10:29 AM
30-Nov-24

```
a[0][0]addr=65492,value 1  
a[0][1]addr=65494,value 2  
a[0][2]addr=65496,value 3  
a[1][0]addr=65498,value 4  
a[1][1]addr=65500,value 5  
a[1][2]addr=65502,value 6
```

Direct initialization of 2*3 matrix:

TC

File Edit Run Compile Project Options Debug

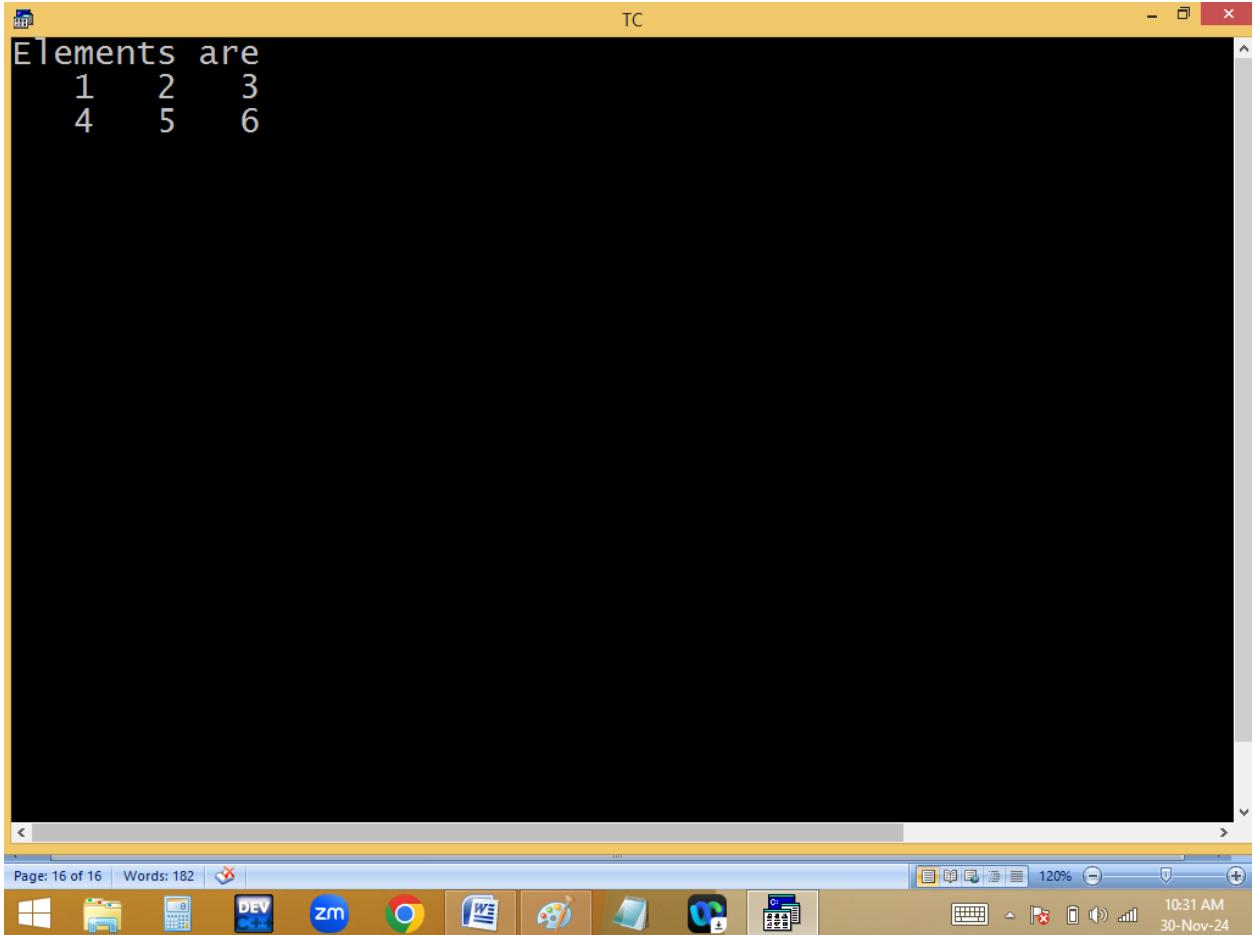
Line 7 Col 23 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3},{4,5,6}},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 15 of 15 Words: 5/182



120% 10:31 AM 30-Nov-24



TC

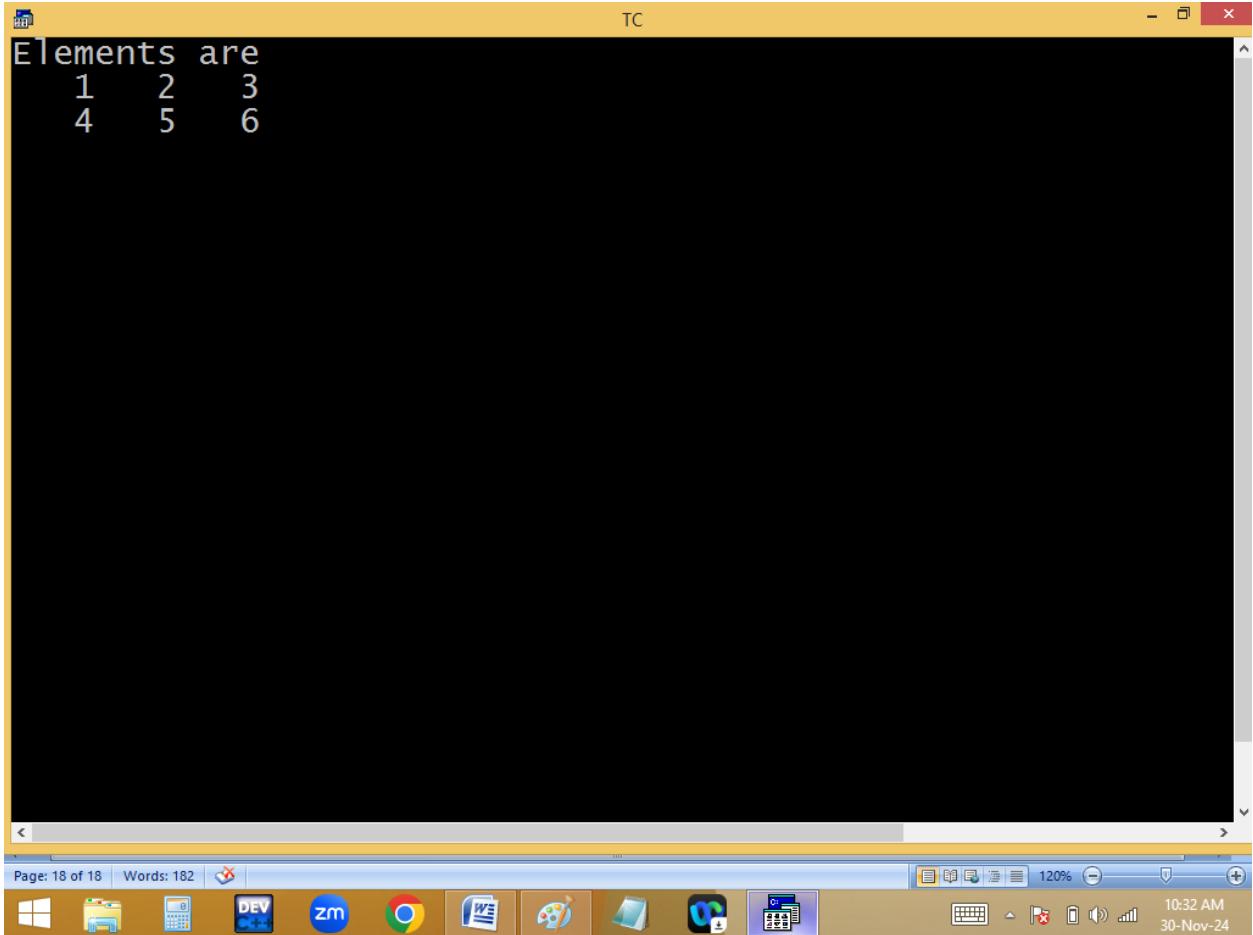
File Edit Run Compile Project Options Debug

Line 5 Col 25 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={1,2,3,4,5,6},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 17 of 17 Words: 182

120% 10:32 AM 30-Nov-24



TC

File Edit Run Compile Project Options Debug

Line 5 Col 17 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={1,2},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 19 of 19 Words: 182

120% 10:34 AM 30-Nov-24

```
TC
Elements are
1 2 0
0 0 0
```

The screenshot shows a Microsoft Word document window titled "TC". The content of the document is the text "Elements are" followed by a 3x3 matrix of values: 1, 2, 0; 0, 0, 0. The Microsoft Word ribbon is visible at the bottom of the screen, showing various icons and status information like "Page: 20 of 20", "Words: 182", and the date "30-Nov-24".

TC

File Edit Run Compile Project Options Debug

Line 5 Col 21 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1},{2}},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 21 of 21 Words: 182

120% 10:34 AM 30-Nov-24



```
TC
Elements are
1 0 0
2 0 0
```

The screenshot shows a Microsoft Word document window titled "TC". The content of the document is "Elements are" followed by two rows of data: "1 0 0" and "2 0 0". The Word ribbon is visible at the top, and the taskbar at the bottom shows various open applications including Dev, ZM, Chrome, and File Explorer. The system tray indicates the date and time as 10:35 AM on 30-Nov-24.

TC

File Edit Run Compile Project Options Debug

Error: Too many initializers in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1},{2},{3}},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 23 of 23 Words: 182

120% 10:36 AM 30-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Too many initializers in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1},{2},3},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 24 of 24 Words: 182

120% 10:37 AM 30-Nov-24

TC

File Edit Run Compile Project Options Debug

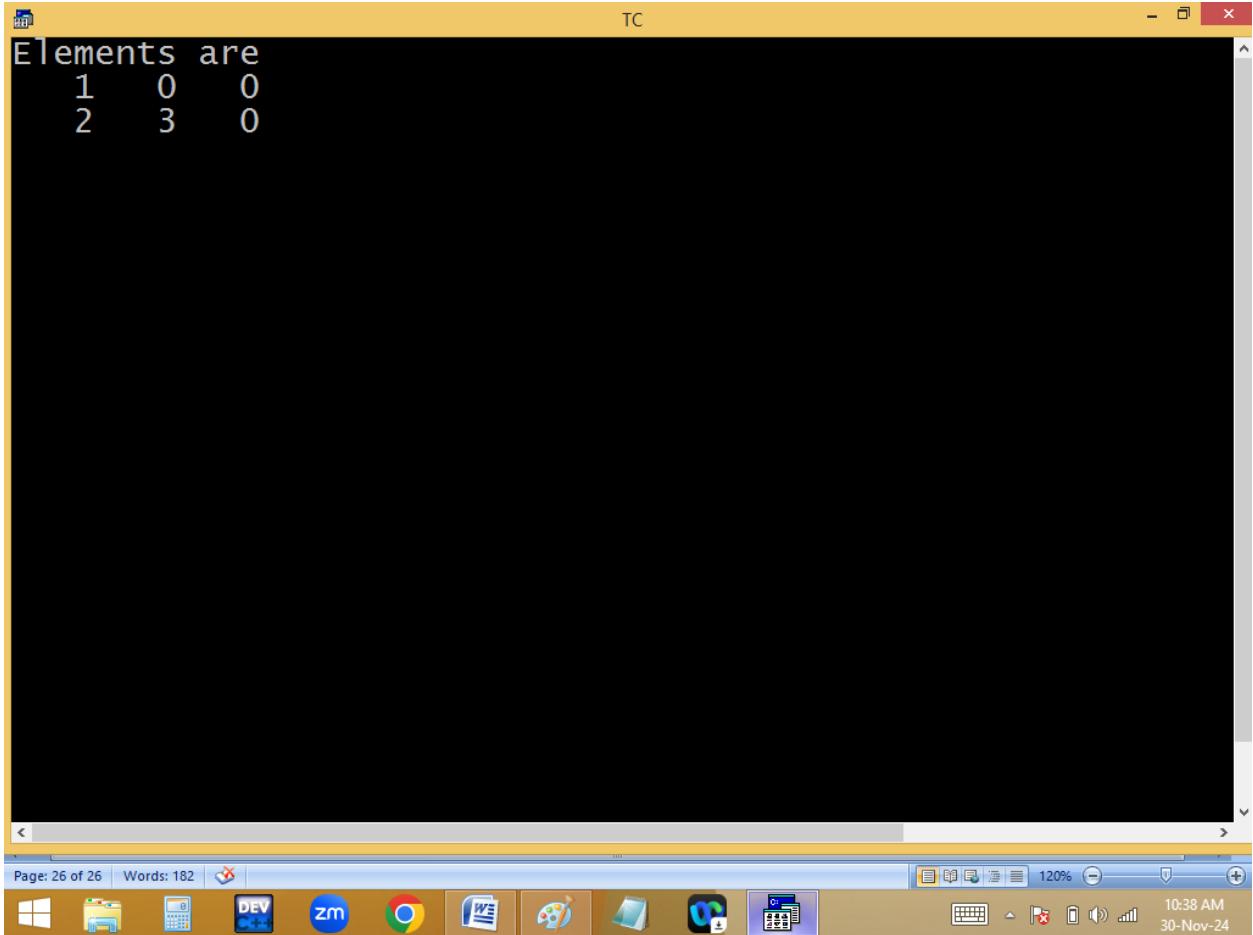
Line 5 Col 23 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1},2,{3}},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 25 of 25 Words: 182



120% 10:38 AM 30-Nov-24



TC

File Edit Run Compile Project Options Debug

Error: Too many initializers in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3,4},5,6},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 27 of 27 Words: 182

120% 10:39 AM 30-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Initializer syntax error in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3},{ }} ,r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 28 of 28 Words: 182

120%

10:40 AM
30-Nov-24

TC

File Edit Run Compile Project Options Debug

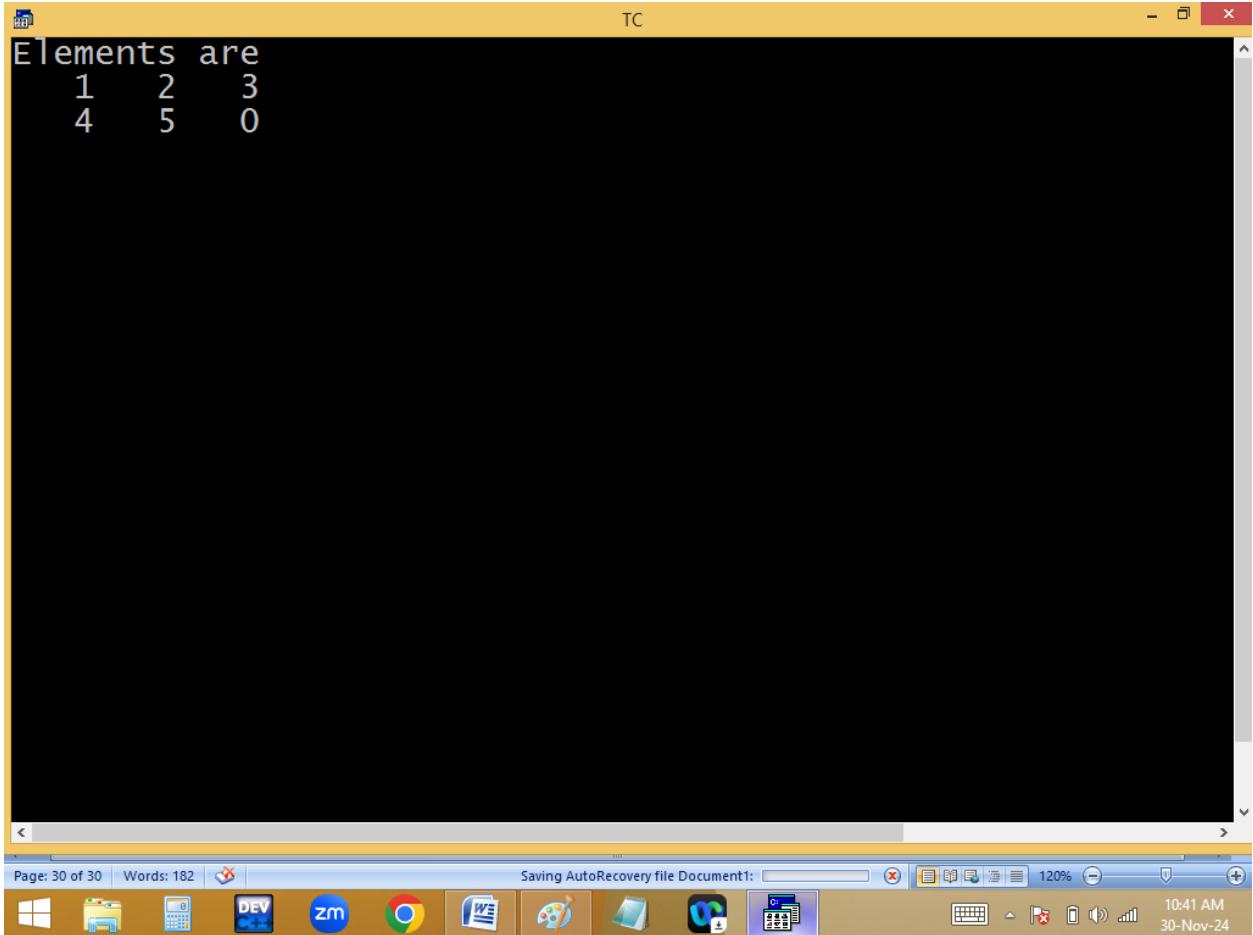
Line 5 Col 25 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][3]={{1,2,3},4,5},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 29 of 29 Words: 182

120%

10:41 AM
30-Nov-24



TC

File Edit Run Compile Project Options Debug

Error: Size of structure or array not known in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[][]={1,2,3,4,5,5},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 31 of 31 Words: 182

120%

10:41 AM
30-Nov-24

TC

File Edit Run Compile Project Options Debug

Error: Size of structure or array not known in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][]={1,2,3,4,5,5},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 32 of 32 Words: 182

120% 10:42 AM 30-Nov-24

TC

File Edit Run Compile Project Options Debug

Line 5 Col 10 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[][]={1,2,3,4,5,5},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 33 of 33 Words: 182



120% 10:43 AM 30-Nov-24

```
Elements are  
1 2 3  
4 5 5
```

TC

File Edit Run Compile Project Options Debug

Line 12 Col 11 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[][]={1,2,3},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%6d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 35 of 35 Words: 182

120%

10:45 AM
30-Nov-24

```
TC
Elements are
 1   2   3
 -20  285  1
```

The screenshot shows a Windows operating system interface. At the top is a yellow taskbar with a window titled "TC". Inside the window, the text "Elements are" is followed by three rows of numbers: "1 2 3", "-20 285", and "1". Below the window is a standard Windows taskbar. On the taskbar, from left to right, there are icons for the Start button, File Explorer, Task View, a calculator, a blue square icon, a "zm" icon, a "DEV" icon, a "Google Chrome" icon, a "File Explorer" icon, a "Paint" icon, a "Calculator" icon, a "Control Panel" icon, and a "Windows Mail" icon. To the right of these icons are several small status indicators. On the far right of the taskbar, the date and time are displayed as "10:45 AM 30-Nov-24".

TC

File Edit Run Compile Project Options Debug

Line 5 Col 14 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[][]={1},r,c;
clrscr();
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%6d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 37 of 37 Words: 182

120%

10:45 AM
30-Nov-24

```
TC
Elements are
 1      0      0
 -20    285    1
```

The screenshot shows a Windows operating system interface. At the top is a yellow taskbar with a window titled "TC". Inside the window, the text "Elements are" is followed by a 3x3 matrix of numbers: 1, 0, 0; -20, 285, 1. Below the window is a standard Windows taskbar. On the taskbar, from left to right, there are icons for File Explorer, Task View, Calculator, DEV, Zoom (zm), Google Chrome, Microsoft Word (WE), Paint, File Explorer, and File Explorer. To the right of these icons are several small system icons. The taskbar also displays the text "Page: 38 of 38 | Words: 182" and "120%". On the far right, it shows the date and time as "10:45 AM 30-Nov-24".

TC

File Edit Run Compile Project Options Debug

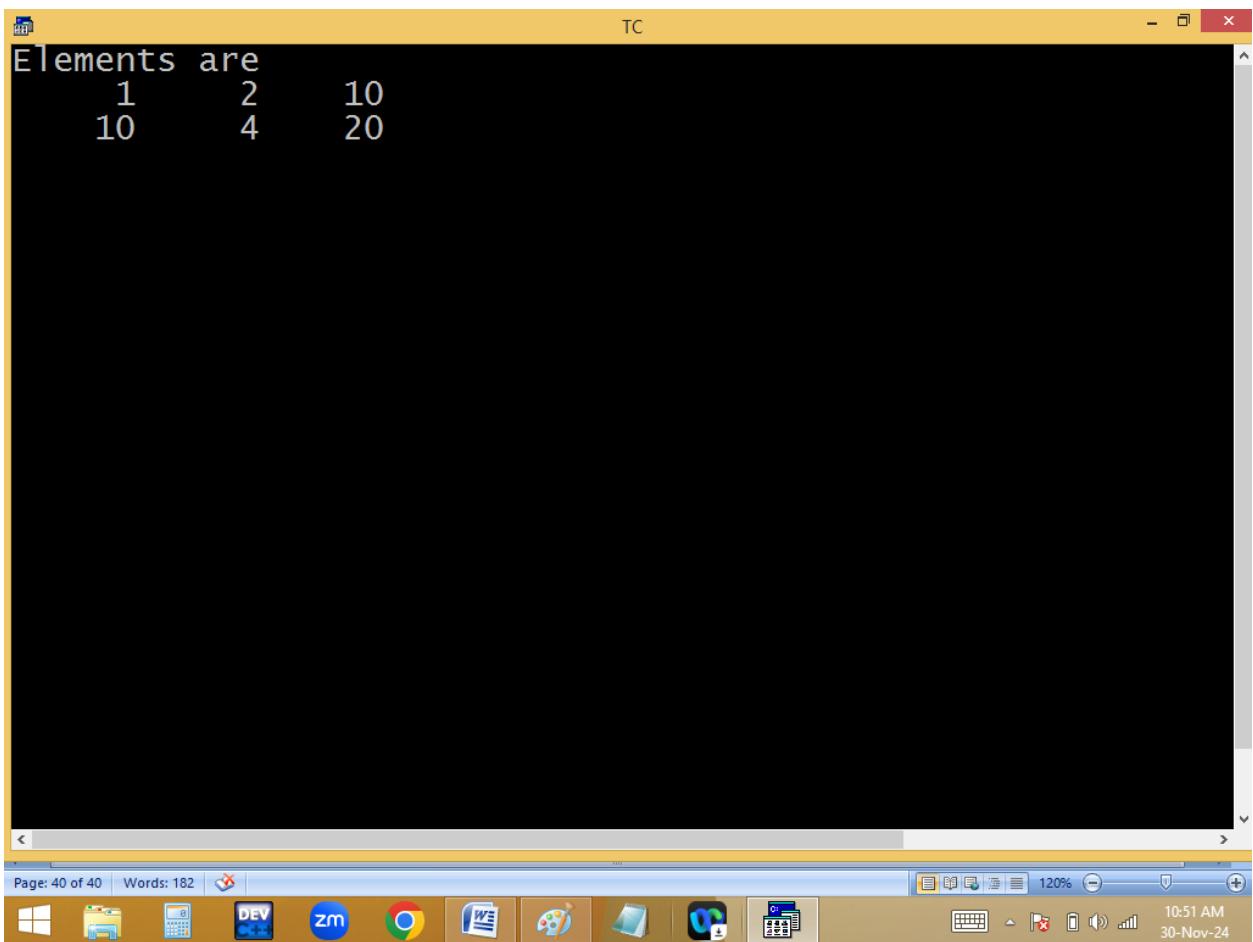
Line 7 Col 24 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][2]={1,2,3,4},r,c;
clrscr();
a[0][2]=10; a[1][2]=20;
puts("Elements are ");
for(r=0;r<2;r++)
{
for(c=0;c<3;c++)
{
printf("%6d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 39 of 39 Words: 182



120% 10:50 AM 30-Nov-24



Reading and printing elements of a n*n matrix:

TC

File Edit Run Compile Project Options Debug

Line 16 Col 11 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
printf("Enter %d elements\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Elements are ");
for(r=0;r<nr;r++)
{
for(c=0;c<nc;c++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:28 AM >
02-Dec-24

```
TC
Enter no of rows and columns 2 3
Enter 6 elements
1 0 2 6 4 9 2
Elements are
1 0 2
6 4 9
```



```
TC
Enter no of rows and columns 3 3
Enter 9 elements
1 2 3 4 5 6 7 8 9
Elements are
 1   2   3
 4   5   6
 7   8   9
```



The screenshot shows a Windows desktop environment. At the top is a black terminal window titled 'TC' with white text. Below it is a light-colored taskbar containing icons for various applications like File Explorer, Edge, and Control Panel. On the right side of the taskbar, there's a system tray with icons for battery, signal strength, and date/time (9:29 AM, 02-Dec-24).

Transpose of n*n matrix:

TC

File Edit Run Compile Project Options Debug

Line 12 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
printf("Enter %d elements\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed Elements are ");
for(c=0;c<nc;c++)
{
for(r=0;r<nr;r++)
{
printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:35 AM >
02-Dec-24

```
TC
Enter no of rows and columns 2 3
Enter 6 elements
1 2 3
4 5 6
Transposed Elements are
1 4
2 5
3 6
```



```

TC
Enter no of rows and columns 3 3
Enter 9 elements
1 2 3 4 5 6 7 8 9
Transposed Elements are
 1   4   7
 2   5   8
 3   6   9

```

```

for(c=0;c<3;c++)
{
    for(r=0;r<2;r++)
    {
        p(a[r] [c]);
    }
    p("\n");
}

```

1 0,0	2 0,1	3 0,2
4 1,0	5 1,1	6 1,2

1	4
2	5
3	6

r	c
0	0
0	1
0	2

Method2:

TC

File Edit Run Compile Project Options Debug

Line 17 Col 20 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[10][10],nr,nc,r,c;
clrscr();
printf("Enter no of rows and columns ");
scanf("%d %d",&nr,&nc);
printf("Enter %d elements\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
puts("Transposed Elements are ");
for(r=0;r<nc;r++)
{
for(c=0;c<nr;c++)
{
printf("%4d",a[c][r]);
}
printf("\n");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:40 AM >
02-Dec-24

```

TC
Enter no of rows and columns 5 2
Enter 10 elements
1 2
3 4
5 6
7 8
9 0
Transposed Elements are
1 3 5 7 9
2 4 6 8 0

```

```

for(r=0;r<3;r++)
{
    for(c=0;c<2;c++)
    {
        :
        p(a[c][r]);
    }
    p("\n");
}

```

$\frac{c}{0 \ 1 \ 2} \quad \frac{r}{0 \ 1 \ 2}$
 $0 \ 1 \ 2 \ 1$
 $0 \ 1 \ 2 \ 2$
~~3~~

1 0,0	2 0,1	3 0,2
4 1,0	5 1,1	6 1,2

1	4
2	5
3	6

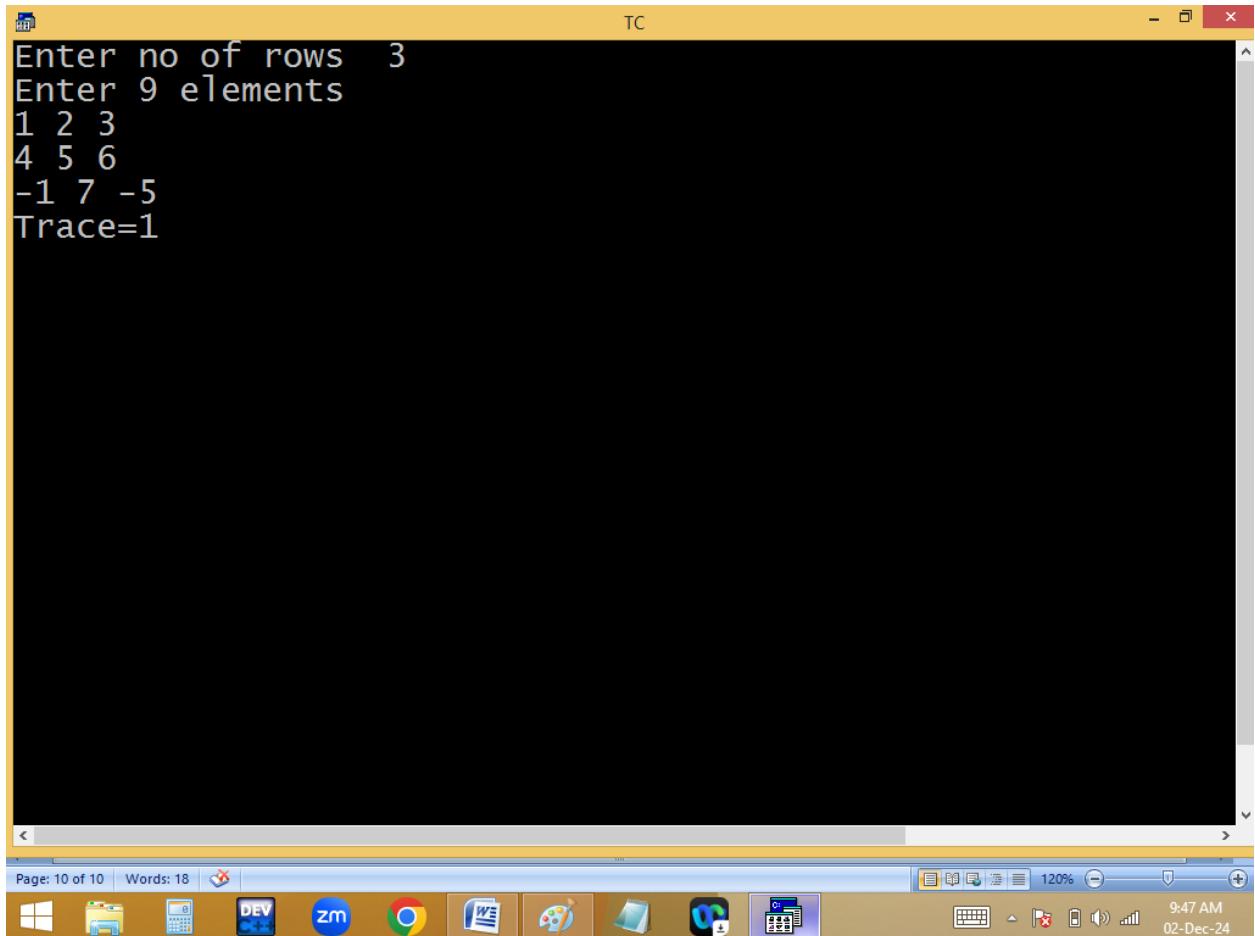
Finding trace of n*n matrix:

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom shows "Line 1 Col 1 Insert Indent Tab Fill Unindent *". The code area contains the following C program:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[10][10],nr,r,c,s=0;
    clrscr();
    printf("Enter no of rows   ");
    scanf("%d",&nr);
    printf("Enter %d elements\n",nr*nr);
    for(r=0;r<nr;r++)for(c=0;c<nr;c++)
    {scanf("%d",&a[r][c]);if(r==c)s+=a[r][c];}
    printf("Trace=%d",s);
    getch();
}
```

The taskbar at the bottom displays various pinned icons, including File Explorer, Task View, Calculator, Dev, Zoom, Google Chrome, File Explorer again, Paint, Mail, and File Explorer once more. The system tray shows the date and time as 9:47 AM on 02-Dec-24.

```
TC
Enter no of rows  3
Enter 9 elements
1 2 3
4 5 6
-1 7 -5
Trace=1
```



The screenshot shows a Windows operating system interface. At the top is a yellow taskbar with the title 'TC'. Below it is a black terminal window containing the text shown above. The taskbar also features a search bar, pinned app icons for File Explorer, Edge, and File History, and system icons for battery, signal, and volume. On the right side of the taskbar, there are icons for keyboard, mouse, and touch settings, followed by a zoom level indicator set at 120% and a date/time stamp showing '9:47 AM 02-Dec-24'.

```
TC
Enter no of rows  2
Enter 4 elements
1 2
3 9
Trace=10
```

Sum of principle diagonal elements:

```
if(r==c)s+=a[r][c];
```

	1	2	3
0,0	0,1	0,2	
4	5	6	
1,0	1,1	1,2	
-1	7	-5	
2,0	2,1	2,2	

$$\begin{array}{r} Y \\ 0 \checkmark \\ 1 \\ 2 \end{array} \quad \begin{array}{r} C \\ 012 \\ 012 \\ 012 \end{array} \quad \begin{array}{r} S \\ 0+|+5+-5 \Rightarrow \text{trace} = 1 \end{array}$$

2,0	2,1	2,2
-----	-----	-----

Finding sum of right diagonal elements:

A screenshot of a Windows desktop environment. At the top is the taskbar with various pinned icons. Below it is a large window for the Turbo C++ compiler. The window has a menu bar with File, Edit, Run, Compile, Project, Options, and Debug. A status bar at the bottom shows "Line 11 Col 35". The main area contains C code for a program that reads a square matrix and prints its trace. The code uses standard input-output functions like printf and scanf.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[10][10],nr,r,c,s=0;
    clrscr();
    printf("Enter no of rows   ");
    scanf("%d",&nr);
    printf("Enter %d elements\n",nr*nr);
    for(r=0;r<nr;r++)for(c=0;c<nr;c++)
    {scanf("%d",&a[r][c]);if(r+c==nr-1)s+=a[r][c];}
    printf("Trace=%d",s);
    getch();
}
```

```
TC
Enter no of rows 3
Enter 9 elements
1 2 3
4 5 6
-1 7 -5
Trace=7
```

Page: 13 of 13 | Words: 24 | 9:50 AM
Windows Start | File | Home | Insert | Page | Print | 120% | 02-Dec-24

```
if(r+c==nr-1)s+=a[r][c];
```

1 0,0	2 0,1	3 0,2
4 1,0	5 1,1	6 1,2
-1 2,0	7 2,1	-5 2,2

sum=7

$$\frac{n!}{3-1} = 2$$

Finding row sum and column sum:

```
#include<stdio.h>

#include<conio.h>

void main()

{

int a[10][10],nr,r,c,rs,cs;

clrscr();

printf("Enter no of rows ");

scanf("%d",&nr);

printf("Enter %d elements\n",nr*nr);

for(r=0;r<nr;r++)for(c=0;c<nr;c++)scanf("%d",&a[r][c]);

for(r=0;r<nr;r++)

{

for(rs=cs=c=0;c<nr;c++)

{

rs+=a[r][c]; cs+=a[c][r];
```

```
}

a[r][c]=rs; a[c][r]=cs;

}

puts("Elements and sum is");

for(r=0;r<=nr;r++)

{

for(c=0;c<=nr;c++)

{

if(r==nr && c==nr)continue; else printf("%4d",a[r][c]);

}

printf("\n");

}

getch();
```

}

```
TC
Enter no of rows  2
Enter 4 elements
1 2
3 4
Elements and sum is
 1   2   3
 3   4   7
 4   6

Page: 16 of 16  Words: 76  
   120%    10:07 AM 02-Dec-24
                     
```

TC

File Edit Run Compile Project Options Debug

Line 24 Col 19 Insert Indent Tab Fill Unindent *

```
printf("Enter %d elements\n",nr*nr);
for(r=0;r<nr;r++)for(c=0;c<nr;c++)scanf("%d",&a[r][c]);
for(r=0;r<nr;r++)
{
for(rs=cs=c=0;c<nr;c++)
{
rs+=a[r][c]; cs+=a[c][r];
}
a[r][c]=rs; a[c][r]=cs;
}
puts("Elements and sum is");
for(r=0;r<=nr;r++)
{
for(c=0;c<=nr;c++)
{
if(r==nr && c==nr); else printf("%4d",a[r][c]);
}
printf("\n");
}
getch();
}
```

Page: 17 of 17 Words: 76

120% 10:07 AM 02-Dec-24



Windows taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, Microsoft Edge, Paint, File Explorer, Control Panel, Task View, Keyboard, Mouse, Network, Volume, Date and Time.

```

TC
Enter no of rows  2
Enter 4 elements
1 2
3 4
Elements and sum is
1   2   3
3   4   7
4   6

```

```

✓
for(r=0;r<2;r++)
{
    for(rs=cs=c=0;c<2;c++)
    {
        rs+=a[r][c];
        cs+=a[c][r];
    }
    a[r][c]=rs; ✓
    a[c][r]=cs;
}
✗

```

1	2	3
0,0	0,1	0,2
4	5	9
1,0	1,1	1,2
5	7	2,2

$$\frac{r}{0} \quad \frac{c}{1,2} \quad \frac{rs}{0+1+2=3} \quad \frac{cs}{0+1+4=5}$$

$$| \quad 0 | 2 \quad 0+4+5=9 \quad 0+2+5=7$$

Printing below output:

9	0	4	2
0,0	0,1	0,2	0,3
1	7	6	8
1,0	1,1	1,2	1,3

	Even	Odd	Zero
1-row	2	1	1
2-row	2	2	0

TC

File Edit Run Compile Project Options Debug

Line 1 Col 32 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[10][10],nr,nc,r,c,e,o,z; clrscr();
    printf("Enter no of rows and columns ");
    scanf("%d%d",&nr,&nc);
    printf("Enter %d elements\n",nr*nc);
    for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
    puts("\t Even\todd\tZero");
    puts("-----");
    for(r=0;r<nr;r++)
    {
        for(e=o=z=c=0;c<nc;c++)
        {
            if(a[r][c]==0)z++;else if(a[r][c]%2==0)e++;else o++;
        }
        printf("%d-row\t %d\t%d\t%d\n",r+1,e,o,z);
    }
    getch();
}
```

Page: 20 of 20 Words: 79

120% 10:34 AM 02-Dec-24



```

Enter no of rows and columns 2 4
Enter 8 elements
9 0 4 2
1 7 6 8
      Even   Odd   Zero
-----
1-row    2       1       1
2-row    2       2       0

```

Page: 20 of 21 Words: 79

10:35 AM 02-Dec-24

```

puts("\tEven\tOdd\tZero");
puts("-----");
for(r=0;r<2;r++)
{
    for(e=o=z=c=0;c<4;c++)
    {
        if(a[r][c]==0)z++;
        else if(a[r][c]%2==0)e++;
        else o++;
    }
    p("%d-row\t%d\t%d\t%d\n",r+1,e,o,z);
}

```

9	0	4	2
0,0	0,1	0,2	0,3
1	7	6	8
1,0	1,1	1,2	1,3

	Even	Odd	Zero
1-row	2	1	1
2-row	2	2	0

6 1 2 3 4 5 1 2 6 7 8

0 1 2 3 0 1 2 0 1 0

Finding fractions of n*n matrix:

a/b matrix:

TC

File Edit Run Compile Project Options Debug

Line 21 Col 11 Insert Indent Tab Fill Unindent *

```
#include<stdio.h> #include<conio.h>
void dummy(float a){float *p=&a;}
void main()
{float a[10][10],b[10][10];int nr,nc,r,c; clrscr();
printf("Enter no of rows and columns ");
scanf("%d%d",&nr,&nc);
printf("Enter %d elements for 1st array\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%f",&a[r][c]);
printf("Enter %d elements for 1st array\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%f",&b[r][c]);

puts("Elements are");
puts("-----");
for(r=0;r<nr;r++)
{
for(c=0;c<nc;c++)
{
printf("%10.2f",a[r][c]/b[r][c]);
}
printf("\n");
}getch(); }
```

1894 x 763px

100% 10:44 AM 02-Dec-24

```
TC
Enter no of rows and columns 2 2
Enter 4 elements for 1st array
5.5 3.3 7.25 9.12
Enter 4 elements for 1st array
4.5 8.8 2.22 6.5
Elements are
-----
      1.22      0.37
      3.27      1.40
```

The screenshot shows a Windows operating system interface. At the top is a yellow taskbar with various icons. Below it is a black command-line window titled 'TC'. The window contains the output of a C++ program. The program asks for the number of rows and columns (2 2), then asks for four elements for two arrays. It prints the elements and ends with a dashed separator and a 2x2 matrix of values. The taskbar also shows the date and time (10:44 AM, 02-Dec-24) and system status indicators.

```
TC
Enter no of rows and columns 2 2
Enter 4 elements for 1st array
1 2 3 4
Enter 4 elements for 1st array
5 6 7 8
Elements are
-----
0.20      0.33
0.43      0.50
```

Page: 25 of 25 | Words: 86 | 120% 10:45 AM 02-Dec-24

a

5.5	3.3
0,0	0,1
7.25	9.12
1,0	1,1

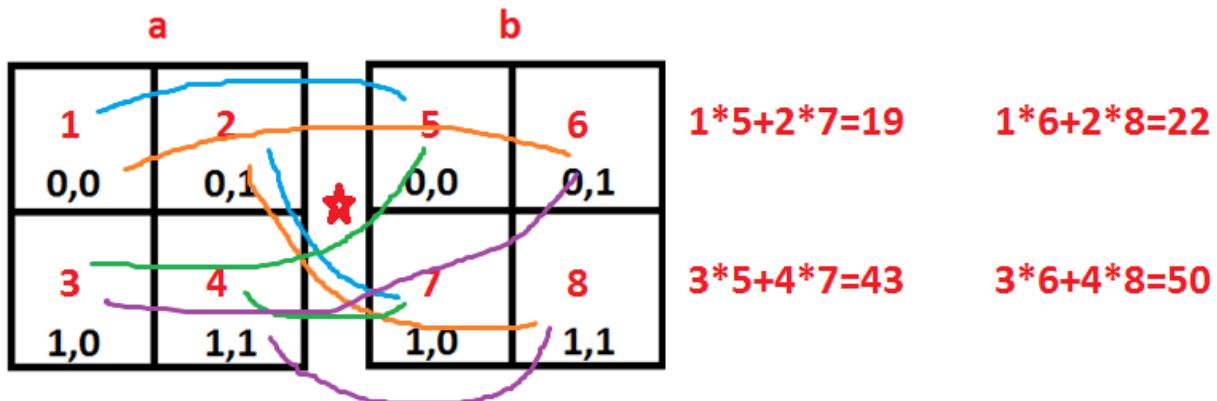
b

4.5	8.8
0,0	0,1
2.22	6.5
1,0	1,1

$$\begin{matrix} 1.22 & 0.38 \\ 3.27 & 1.40 \end{matrix}$$

Matrix multiplication:

Matrix multiplication:



TC

File Edit Run Compile Project Options Debug

Line 1 Col 21 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h> #include<conio.h>
void main(){
int a[10][10],b[10][10];int nr,nc,r,c,k,s; clrscr();
printf("Enter no of rows and columns ");
scanf("%d%d",&nr,&nc);
printf("Enter %d elements for 1st array\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&a[r][c]);
printf("Enter %d elements for 2nd array\n",nr*nc);
for(r=0;r<nr;r++)for(c=0;c<nc;c++)scanf("%d",&b[r][c]);
puts("Result elements are ");
for(r=0;r<nr;r++)
{
for(c=0;c<nc;c++)
{
for(k=s=0;k<nc;k++)
{s+=a[r][k]*b[k][c];}
printf("%4d",s);
}
printf("\n");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:43 AM >
03-Dec-24

```

TC
Enter no of rows and columns 2 2
Enter 4 elements for 1st array
1 2 3 4
Enter 4 elements for 2nd array
5 6 7 8
Result elements are
19 22
43 50

```

```

for( r=0; r<2; r++ )
{
    for(c=0; c<2; c++)
    {
        for( s=k=0; k<2; k++ )
        {
            s+=a[r][k]*b[k][c];
        }
        p(s); ✓
    }
    p("\n"); ✓
}

```

r	c	k	s
0	0	0 1 2	0+1*5=5+2*7=19 ✓
0	1	0 1 2	0+1*6=6+2*8=22 ✓
1	0	0 1 2	0+3*5=15+4*7=43 ✓
1	1	0 1 2	0+3*6+4*8=50 ✓

a	b		
1 0,0 3 1,0	2 0,1 4 1,1	✓✓✓✓ 1*5+2*7=19	✓✓✓✓ 1*6+2*8=22
5 0,0 7 1,0	6 0,1 8 1,1	✓✓✓ 3*5+4*7=43	✓✓✓ 3*6+4*8=50

3-dimensional arrays:

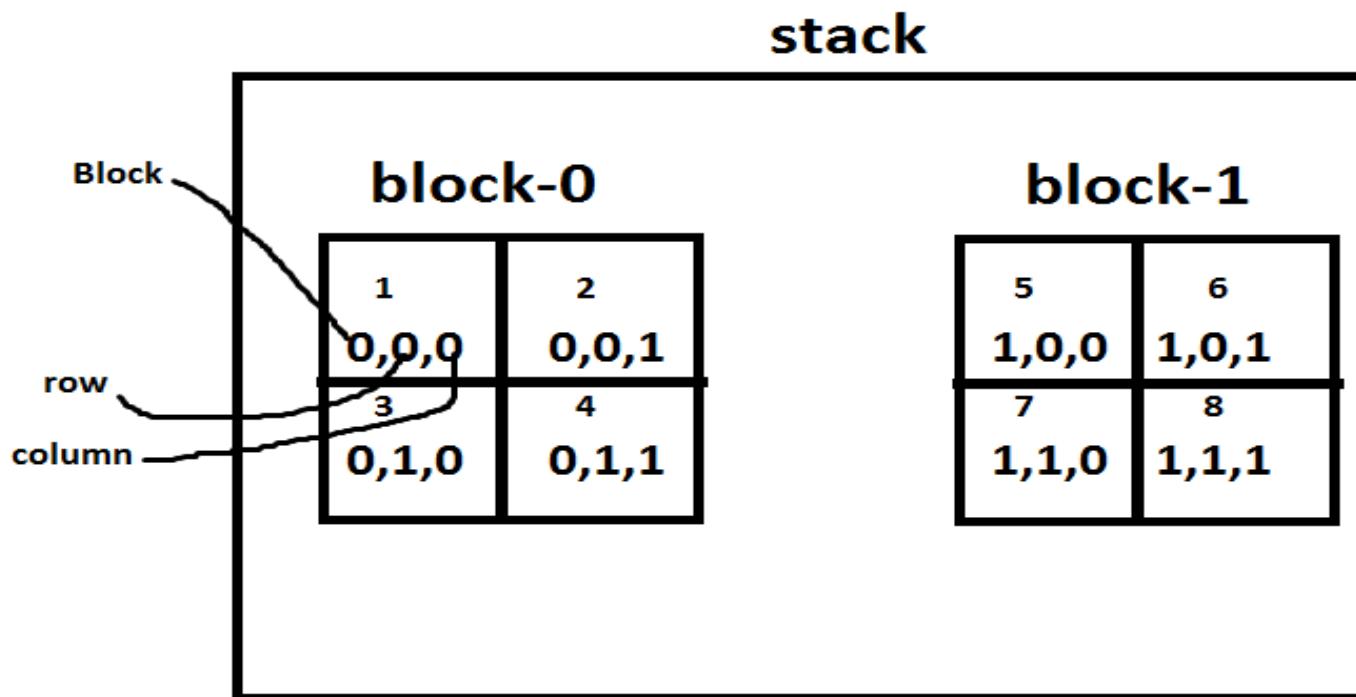
An array with several blocks, rows and columns.

An array with 3 subscripting operators **[][][]**.

Syntax:

```
datatype variable [ blocks ] [ rows ] [ columns  
];
```

Eg: int a[2][2][2]={1,2,3,4,5,6,7,8};

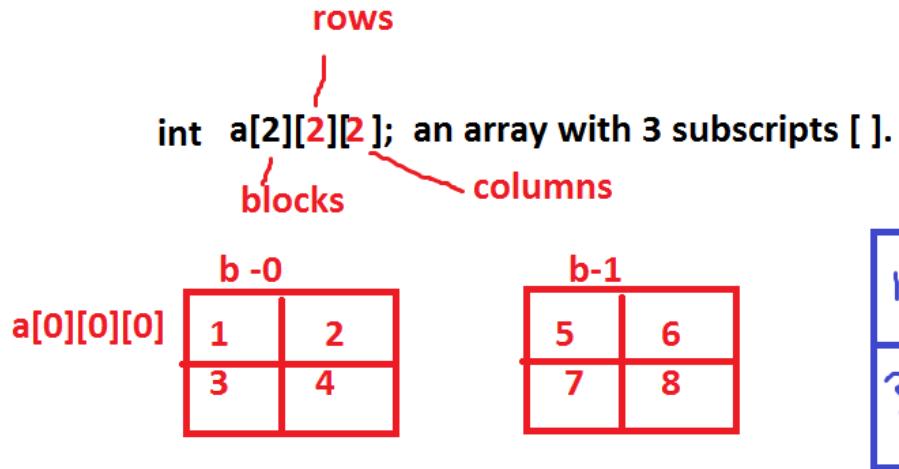


Block - 1

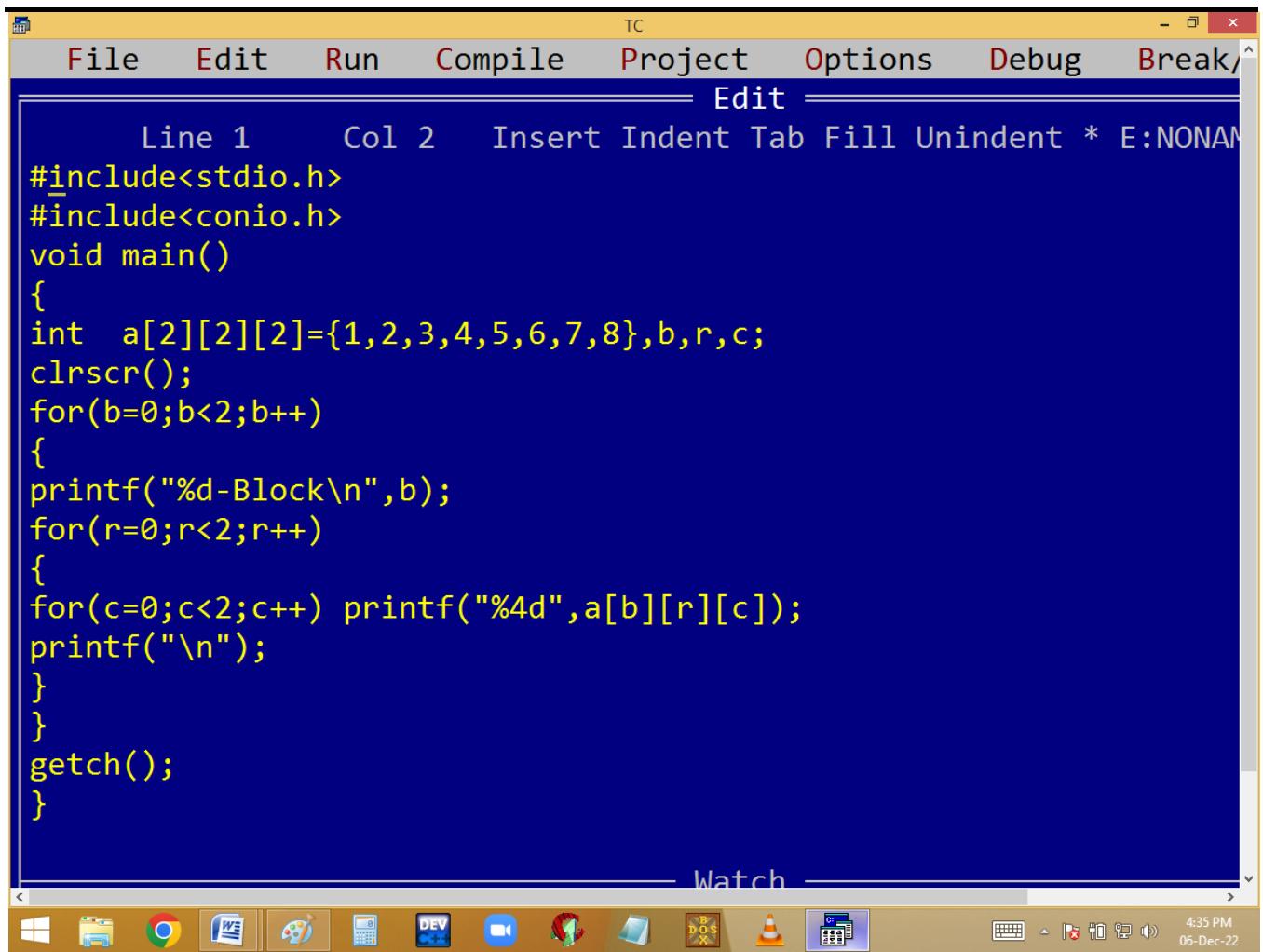
5	6
1,0,0	1,0,1
1	2
0, 0,0	0, 0,1
3	4
0, 1, 0	0,1,1

Block - 0

Eq:



eg: int class[2][60][6];
datatype class[sections][stus][marks];



```

Line 1      Col 2      Insert Indent Tab Fill Unindent * E:NONAM
#include<stdio.h>
#include<conio.h>
void main()
{
    int a[2][2][2]={1,2,3,4,5,6,7,8},b,r,c;
    clrscr();
    for(b=0;b<2;b++)
    {
        printf("%d-Block\n",b);
        for(r=0;r<2;r++)
        {
            for(c=0;c<2;c++) printf("%4d",a[b][r][c]);
            printf("\n");
        }
    }
    getch();
}

```

```
0-Block
 1  2
 3  4
1-Block
 5  6
 7  8
```

4-dimensional array:

An array with several sets, blocks, rows and columns.

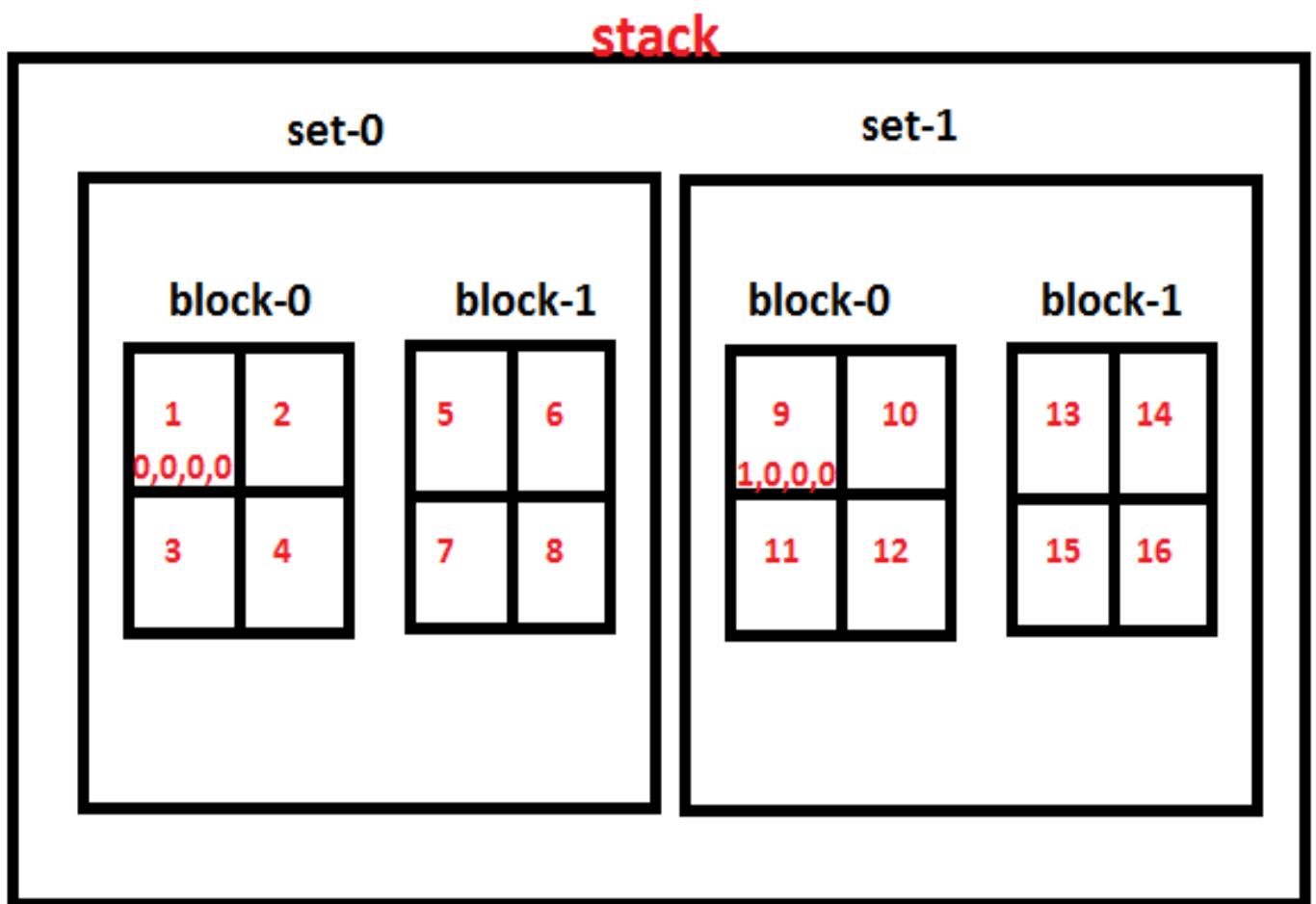
An array with 4 subscripting operators **[] [] [] []**

Syntax:

```
datatype variable [ sets ] [ blocks ] [ rows ] [ cols ];
```

eg:

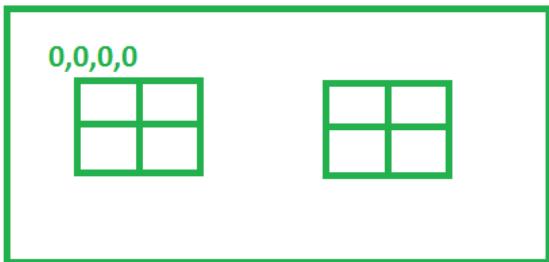
```
int a[2] [2] [2] [2]= {1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16};
```



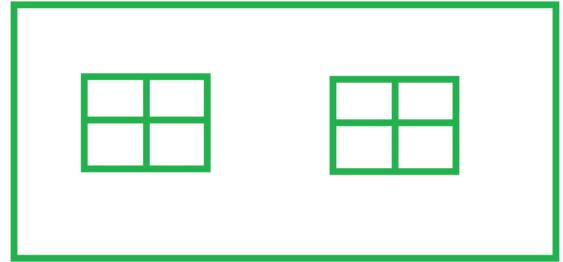
```
datatype var[class][sec][stu][marks];  
int school[5][2][60][6];
```

set rows
int a[2][2][2][2]; an array with 3 subscripts [].
blocks columns

set-0



set-1



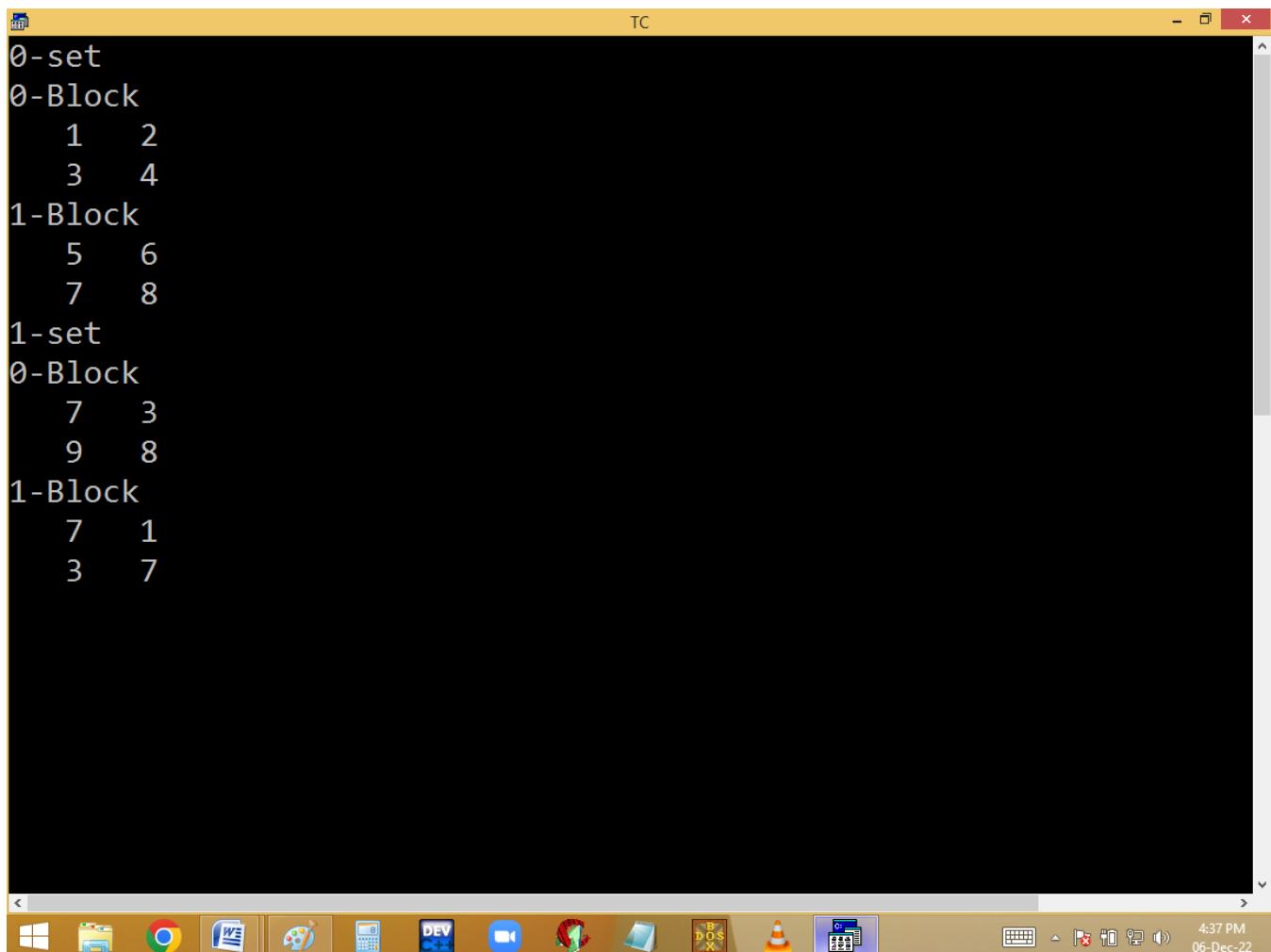
TC

File Edit Run Compile Project Options Debug Break/
Line 1 Col 47 Insert Indent Tab Fill Unindent * E:NONAME

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[2][2][2][2]={1,2,3,4,5,6,7,8,7,3,9,8,7,1,3,7},s,b,r,c;
clrscr();
for(s=0;s<2;s++)
{
printf("%d-set\n",s);
for(b=0;b<2;b++)
{
printf("%d-Block\n",b);
for(r=0;r<2;r++)
{
for(c=0;c<2;c++) printf("%4d",a[s][b][r][c]); printf("\n");
}
}
}
getch();
}
```



4:37 PM
06-Dec-22



```
0-set
0-Block
 1 2
 3 4
1-Block
 5 6
 7 8
1-set
0-Block
 7 3
 9 8
1-Block
 7 1
 3 7
```

STRINGS

- A group of characters is called string.
- It is one dimensional character array.
- It is alpha-numeric.
- It is an implicit pointer.
- It is a derived data type.

Note:

- One byte should be left for Null char(**\0**). Otherwise we are getting garbage or junk values. Null char indicates string is completed.
- String variable Size can't be less than string. Otherwise we are getting error.
- Using **=** operator, we can't copy a string into another. We have to use **strcpy()** or copy character by character manually.
- Using **==** (comparison) operator, we can't compare two strings. Use **strcmp()** or compare the characters one by one manually.

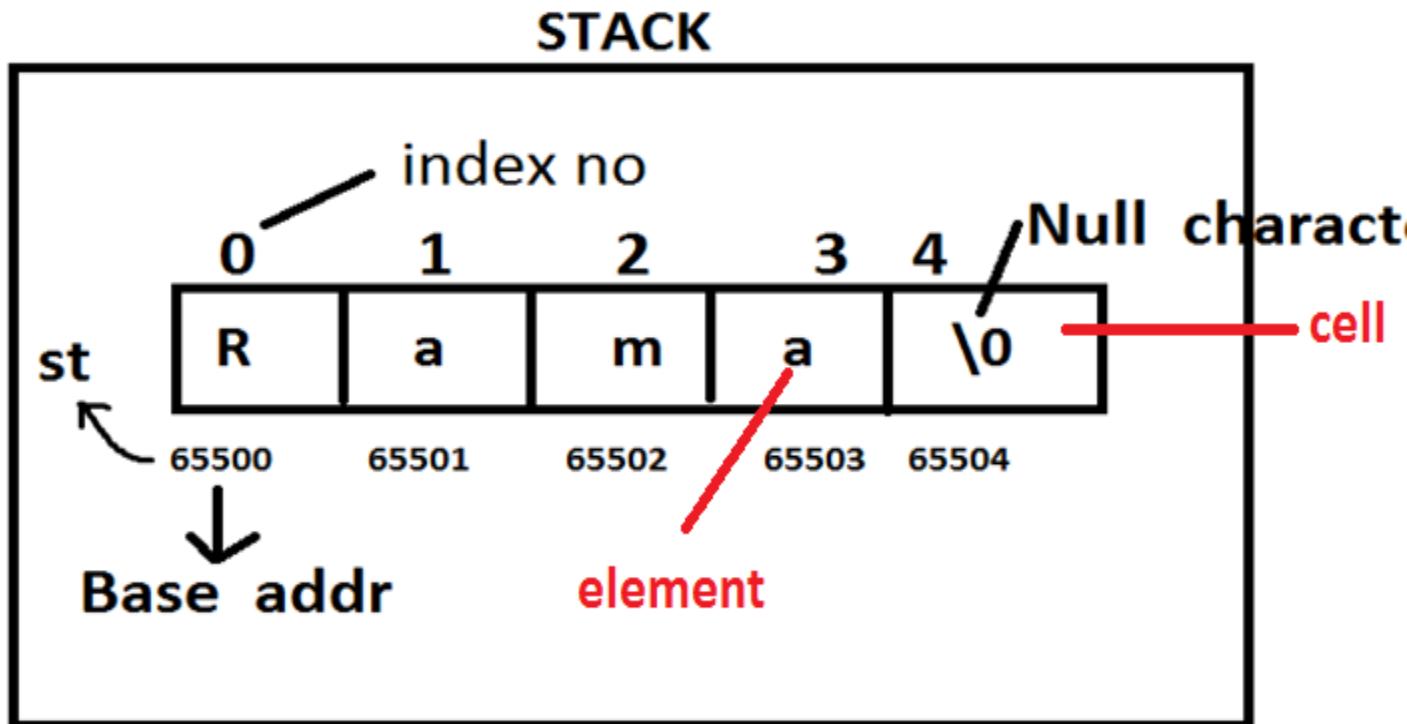
Syntax:

char variable [size] = “string”;

or

```
char variable[ ]="string";
```

Eg: char st[5] = “Rama”;



Note: String is implicit pointer because of string variable stores base address.

String declaration methods:

```
char st [5] ="rama"; Ok
```

```
char st [20] =" Naresh It"; Ok
```

char st [4] = { ‘r’, ‘a’, ‘m’ }; Ok → char array.

char st[3]= “ram”; It gives garbage values in printing.

char st [3] = “rama”; error

char st[0]; error

char st[0]=”abc”; Ok

char st[-5]; error

char st[5.5]; error

char st[5%3]; Ok → char st[2];

char st[3+2]; → st[5] → Ok

char st[] =”Ram”; Ok.

char st[] ; error

int n=20;

char st[n]; No

#define n 20

char st[n]; Ok

Note: String variable size always constant positive integer value.

Finding string address:

TC

File Edit Run Compile Project Options

Line 9 Col 34 Insert Indent Tab Find

```
#include<stdio.h>
#include<conio.h>
void main()
{
char city[10]="Hyd-1";
clrscr();
printf("city[0] cell addr %u\n",&city[0]);
printf("city stored addr %u\n",city);
printf("city address is %u\n",&city);
getch();
}
```

Page: 15 of 15 | Words: 336 |

120% 10:36 AM
03-Dec-24

A screenshot of a Windows desktop environment. At the top, there is a taskbar with various icons for applications like File Explorer, Control Panel, and system tools. In the center, a terminal window titled 'TC' is open, displaying the following text:

```
city[0] cell addr 65494
city stored addr 65494
city address is 65494
```

The terminal window has a dark background and light-colored text. The taskbar at the bottom shows the date and time as 10:36 AM on 03-Dec-24.

Eg:

Direct initialization of a string:

TC

File Edit Run Compile Project Options

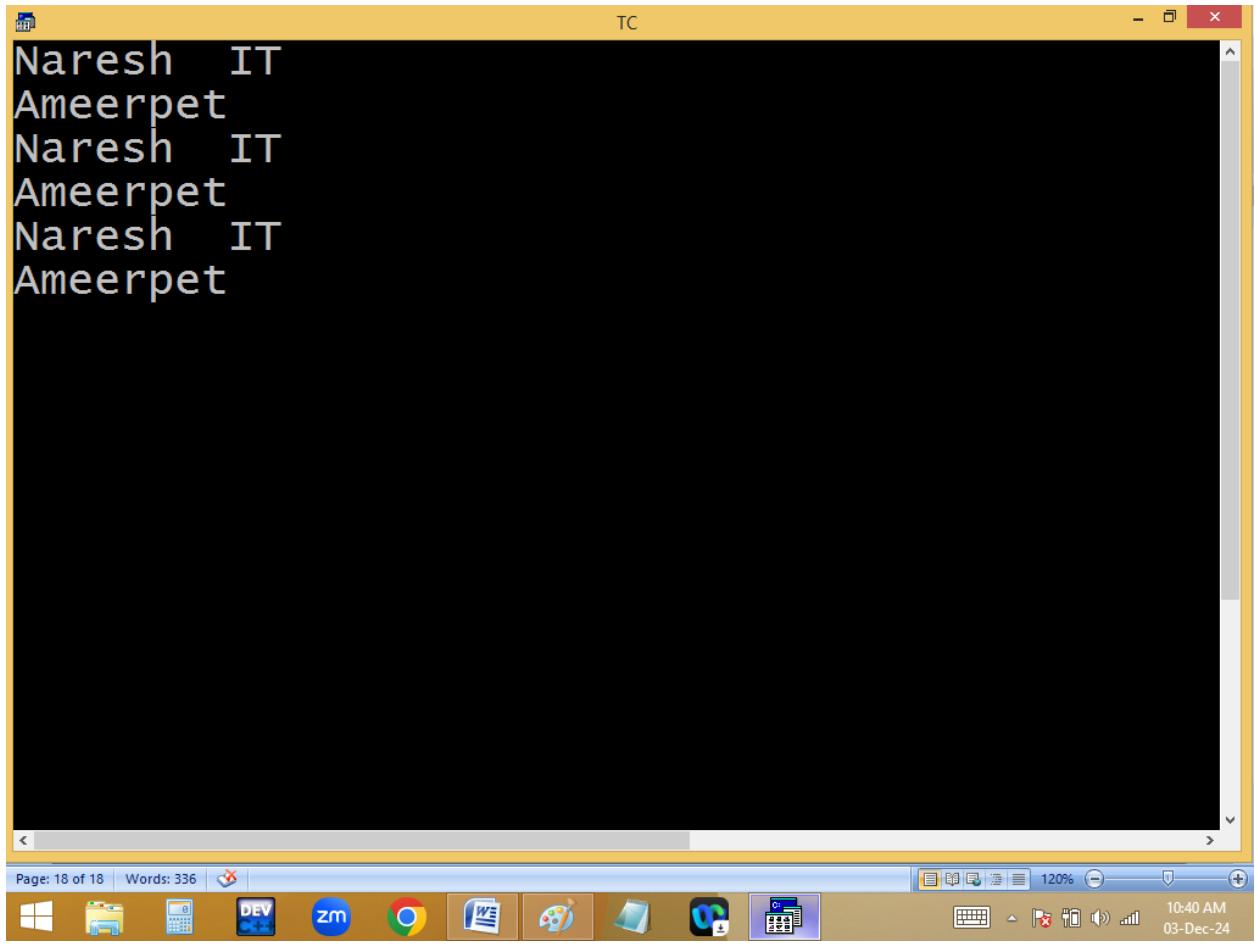
Line 8 Col 9 Insert Indent Tab Find

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100] = "Naresh\tIT\nAmeerpet\0Hyd";
clrscr();
printf("%s\n", s);
puts(s);
printf(s);
getch();
}
```

Page: 17 of 17 Words: 336

120% 10:40 AM 03-Dec-24

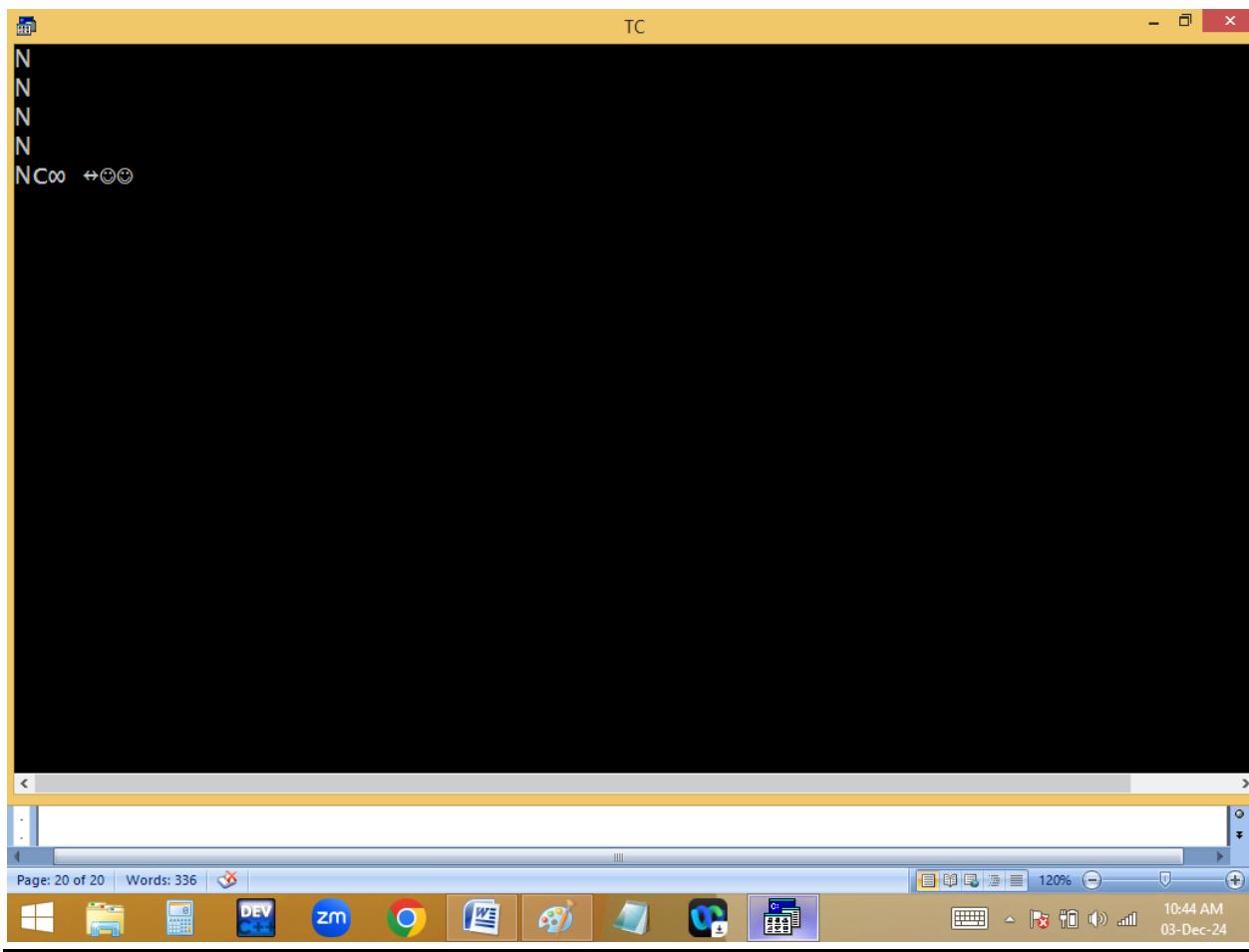




A screenshot of a Windows operating system desktop. In the foreground, a code editor window titled "TC" is open. The menu bar includes File, Edit, Run, Compile, Project, Options, Debug, and Break/watch. The status bar at the bottom shows "Line 11 Col 10 Insert Indent Tab Fill Unindent * E:9AM.C". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s1[2]={"N"},s2[]="N",s3[2]={'N'},s4[]={ 'N', '\0'},s5[]={ 'N' };
clrscr();
puts(s1);
puts(s2);
puts(s3);
puts(s4);
puts(s5);
getch();
}
```

The keyboard status bar at the bottom shows F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, F10-Menu, and NUM. Below the keyboard status bar is a taskbar with various icons for applications like File Explorer, Task View, Calculator, DEV, zm, Google Chrome, File Explorer, Paint, Task View, and File Explorer. The system tray shows the date and time as 10:44 AM 03-Dec-24.



Storing of multiple strings:

A screenshot of a Microsoft Windows desktop environment. In the center is a window for the Turbo C++ compiler. The window title bar says "TC". The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu bar, it shows "Line 6" and "Col 16". The main code area contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char names[5][20]={"Shraddha Kapoor", "Jhanvi Kapoor",
    "Pooja Hegde", "Rashmika Mandana", "Disha Pathani"}; int i;
    clrscr();
    puts("NAMES");
    puts("-----");
    for(i=0;i<5;i++)puts(names[i]);
    getch();
}
```

The status bar at the bottom of the window shows various icons and the text "F1 Help F5 Zoom F6 Switch F7 Trace F8 Stop F9 Make F10". Below the window, the Windows taskbar displays several pinned icons: File Explorer, Task View, Calculator, Dev, zm, Google Chrome, File Explorer, Paint, File Explorer, and Task View again. On the far right of the taskbar, the system tray shows the date and time as "10:48 AM 03-Dec-24".

```
TC
NAMES
-----
Shraddha Kapoor
Jhanvi Kapoor
Pooja Hegde
Rashmika Mandana
Disha Pathani
```



Reading and printing a string:

TC

File Edit Run Compile Project Options Debug

Line 10 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%s",s);
printf("The string is %s",s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

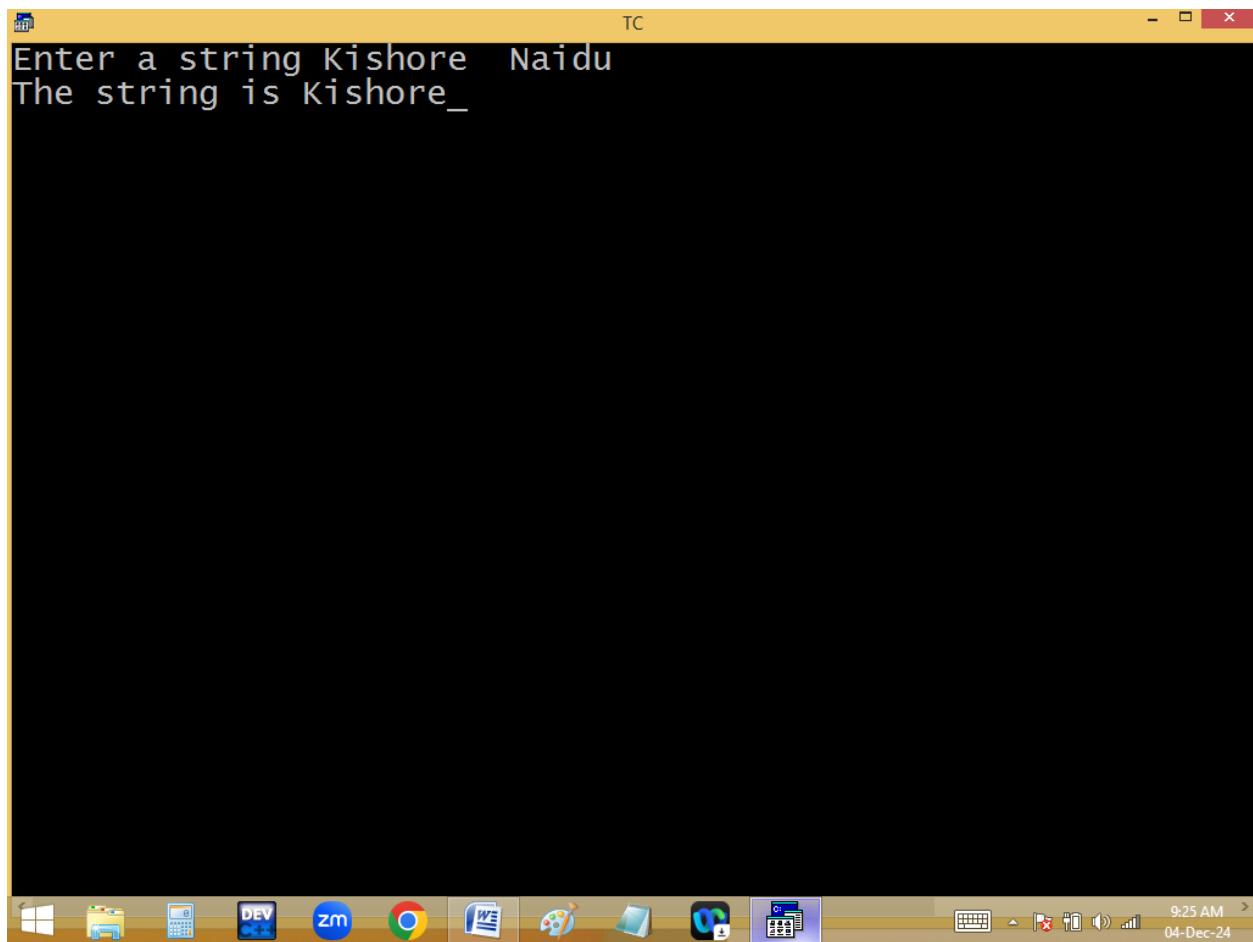


9:25 AM >
04-Dec-24

```
TC
Enter a string kishore
The string is kishore
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the output of a program. The taskbar at the bottom features the Windows logo, File Explorer, Task View, Start button, Task View, Edge browser, Google Chrome, File Explorer, Paint 3D, File Explorer, and File Explorer. The system tray shows the date and time as '9:25 AM 04-Dec-24'.



```
TC
Enter a string Kishore Naidu
The string is Kishore_
```

The screenshot shows a Windows desktop environment. At the top, there's a taskbar with several pinned icons: File Explorer, Task View, Control Panel, Microsoft Edge, Google Chrome, File Explorer again, Paint, File Explorer again, and File Explorer again. On the right side of the taskbar, the system tray displays the date and time as "9:25 AM 04-Dec-24". In the center of the screen, a terminal window titled "TC" is open. It contains the following text:
Enter a string Kishore Naidu
The string is Kishore_

gets(): It allows to read a string with spaces until pressing enter key.

TC

File Edit Run Compile Project Options Debug

Line 7 Col 33 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); gets(s);
printf("The string is %s",s);
getch();
}
```

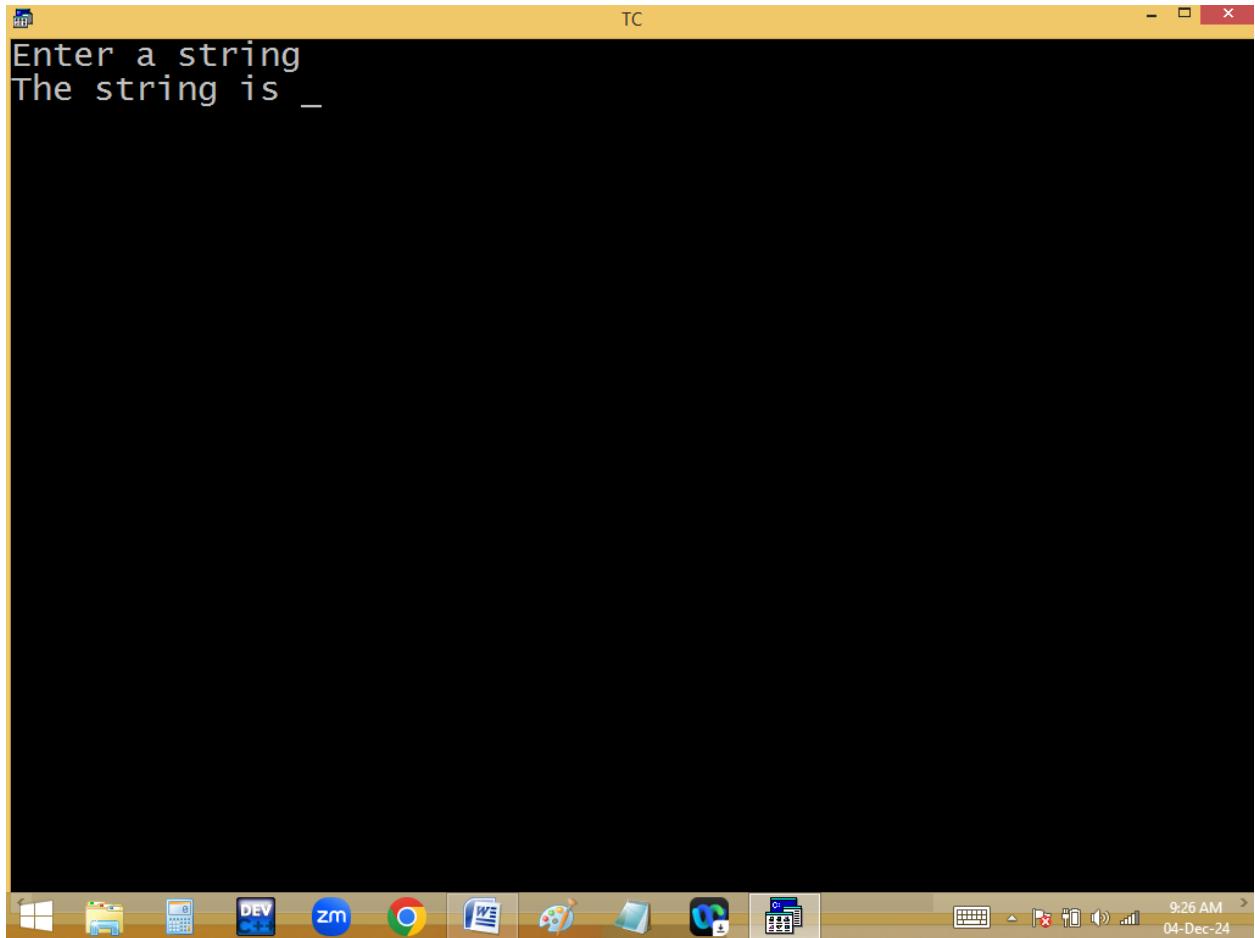
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:26 AM >
04-Dec-24

```
TC
Enter a string Kishore    Naidu
The string is Kishore    Naidu
```

A screenshot of a Windows desktop environment. A terminal window titled 'TC' is open, displaying two lines of text: 'Enter a string Kishore Naidu' and 'The string is Kishore Naidu'. The taskbar at the bottom of the screen contains several pinned icons, including the Start button, File Explorer, Task View, Edge browser, Google Chrome, File Explorer, Paint 3D, File Explorer, and File Explorer. On the far right of the taskbar, the system tray shows the date and time as '9:26 AM 04-Dec-24'.



TC

File Edit Run Compile Project Options Debug

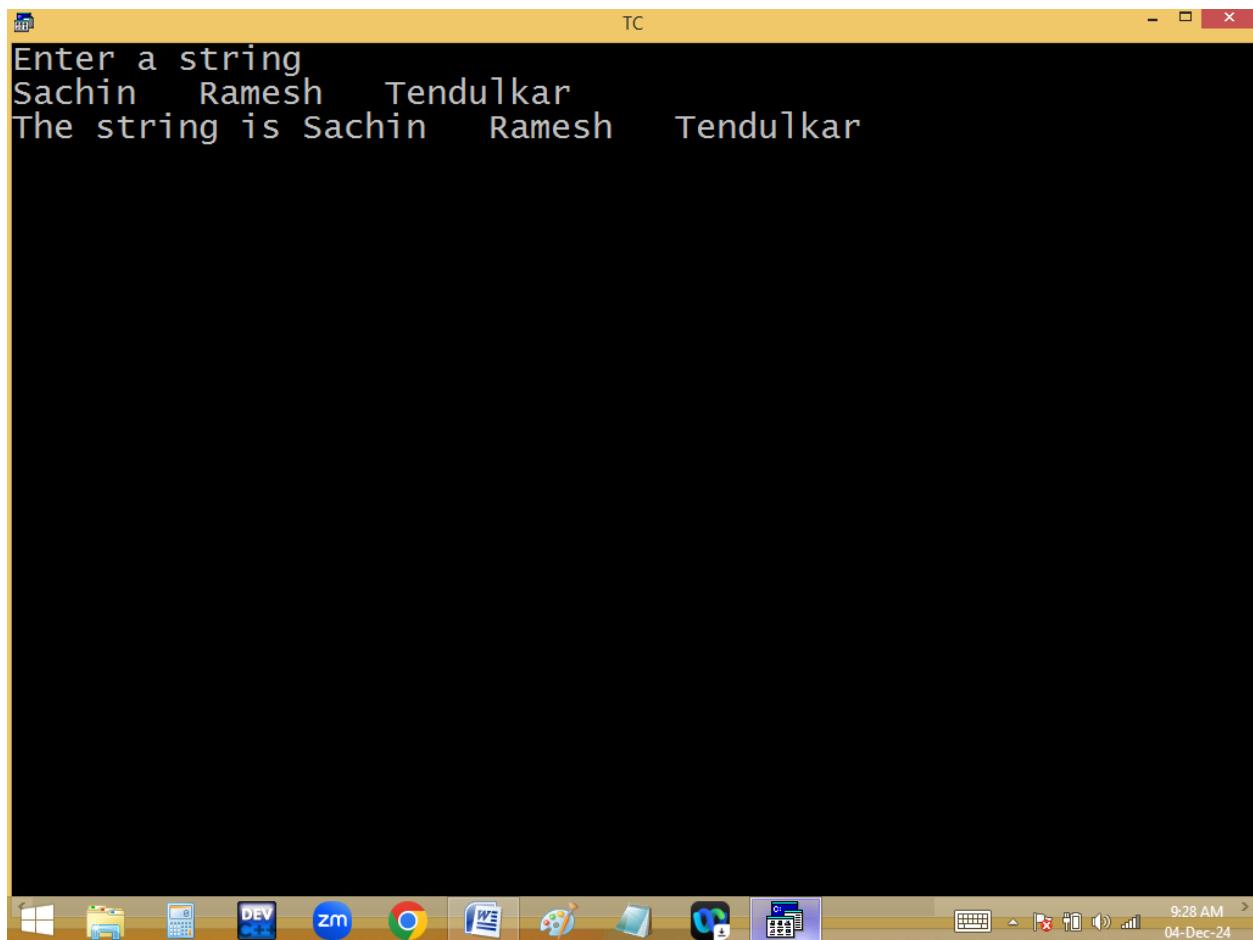
Line 7 Col 32 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
puts("Enter a string "); gets(s);
printf("The string is "); puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:28 AM >
04-Dec-24



Magic / scan set characters:

TC

File Edit Run Compile Project Options Debug

Line 7 Col 44 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[^\\n]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:31 AM >
04-Dec-24

```
TC
Enter a string virat      kohli
The string is virat      kohli
```

A screenshot of a Windows desktop environment. A terminal window titled 'TC' is open, displaying the output of a program. The taskbar at the bottom features several pinned icons, including File Explorer, Edge browser, Task View, and others. The system tray shows the date as 04-Dec-24 and the time as 9:31 AM.

```
TC
Enter a string
The string is
-
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the text 'Enter a string' followed by 'The string is' and a blank line. Below the terminal is a standard Windows taskbar. On the taskbar, from left to right, are icons for File Explorer, Edge browser, Task View, Microsoft Word, Microsoft Paint, Microsoft Edge, Google Chrome, Microsoft Word, Microsoft Paint, Microsoft Edge, and File Explorer. To the right of the taskbar, there are several system status icons, including battery level, signal strength, and volume. The date and time are displayed as '04-Dec-24' and '9:31 AM' respectively.

TC

File Edit Run Compile Project Options Debug

Line 7 Col 39 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[^\n]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:32 AM >
04-Dec-24

```
TC
Enter a string
Kishore
c/o naresh it
ameerpet
hyd=500016.
The string is
Kishore
c/o naresh it
ameerpet
hyd=500016
```



TC

File Edit Run Compile Project Options Debug

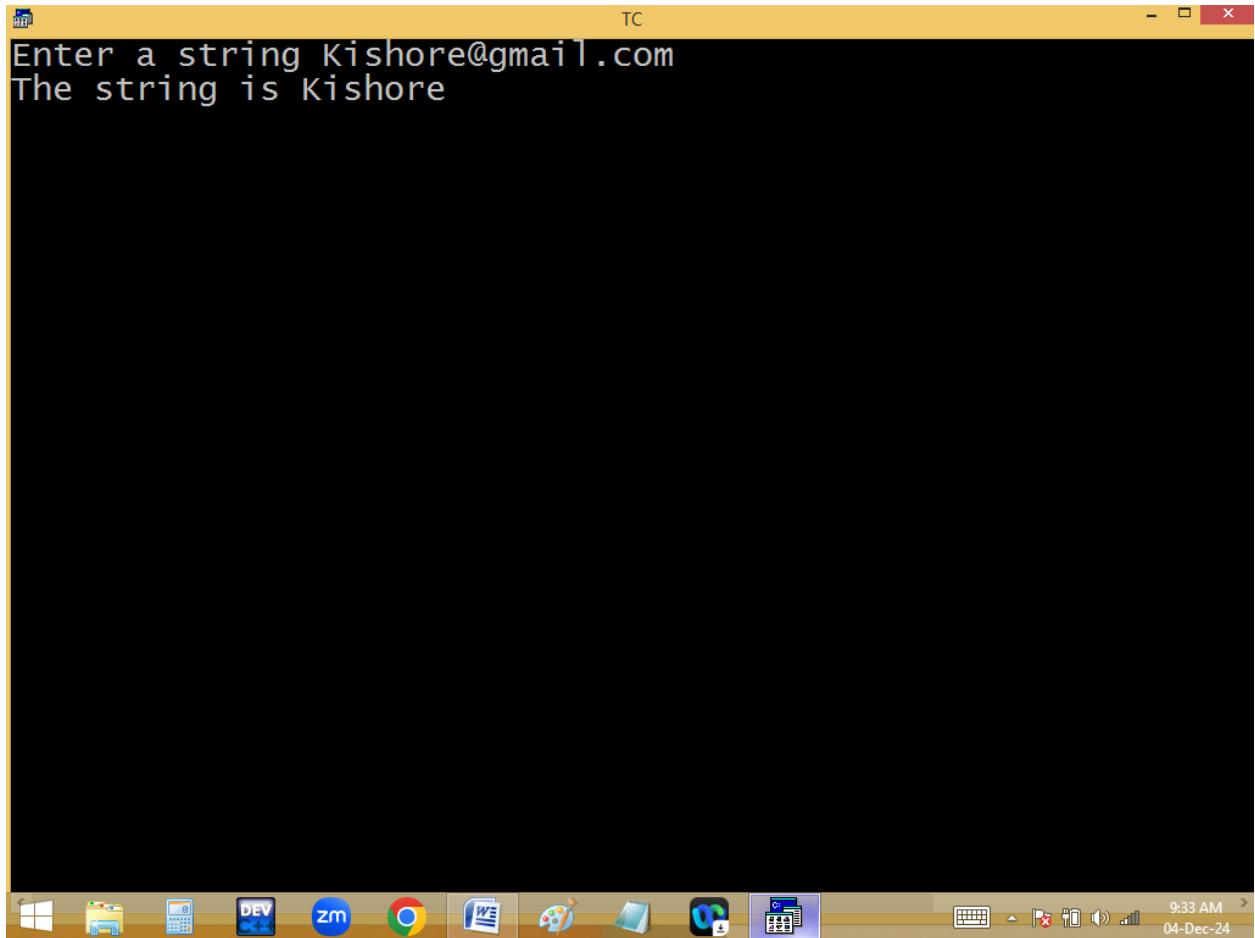
Line 7 Col 42 Insert Indent Tab Fill Unindent * E

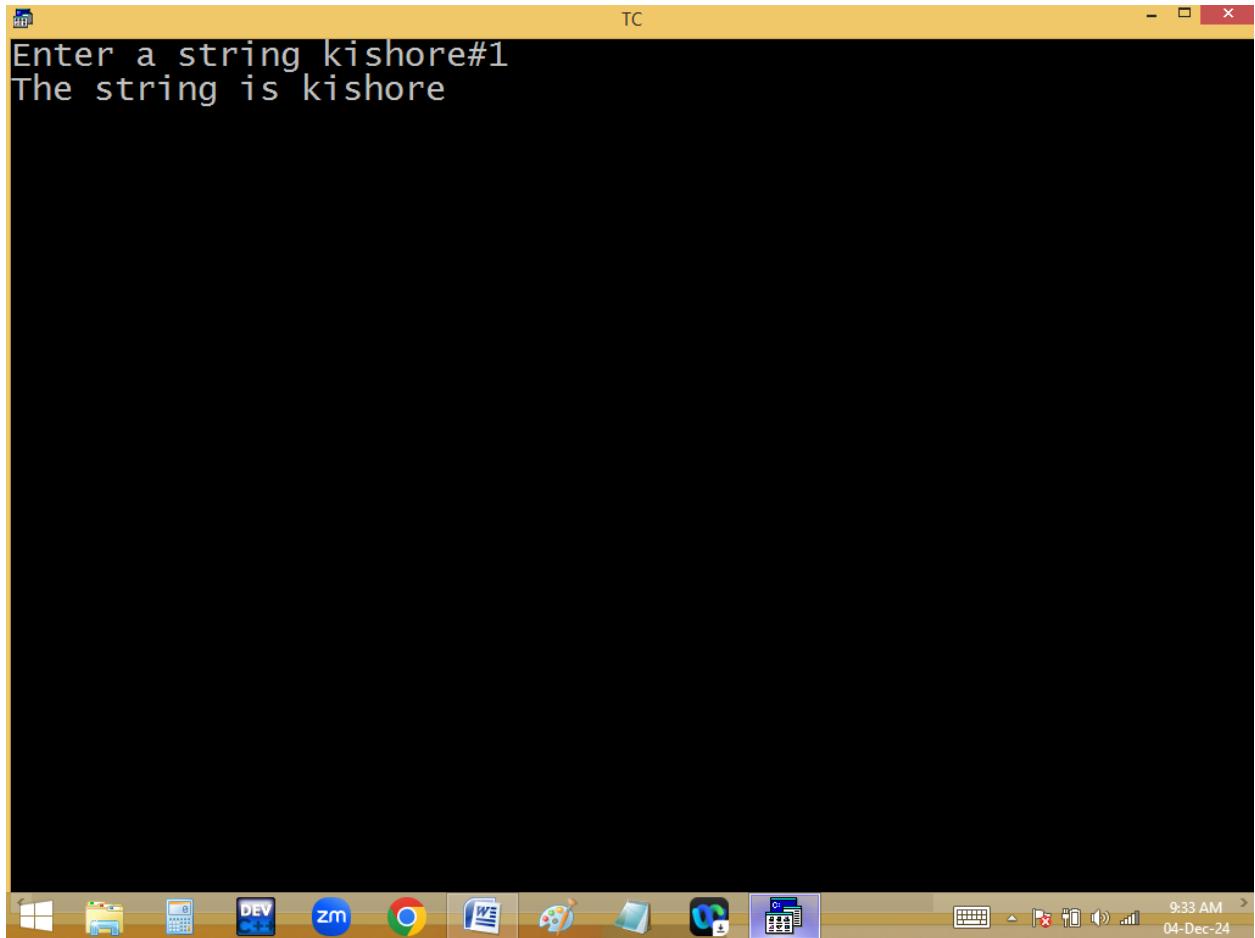
```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[^@#$*]",s);
printf("The string is ");puts(s);
getch();
}
```

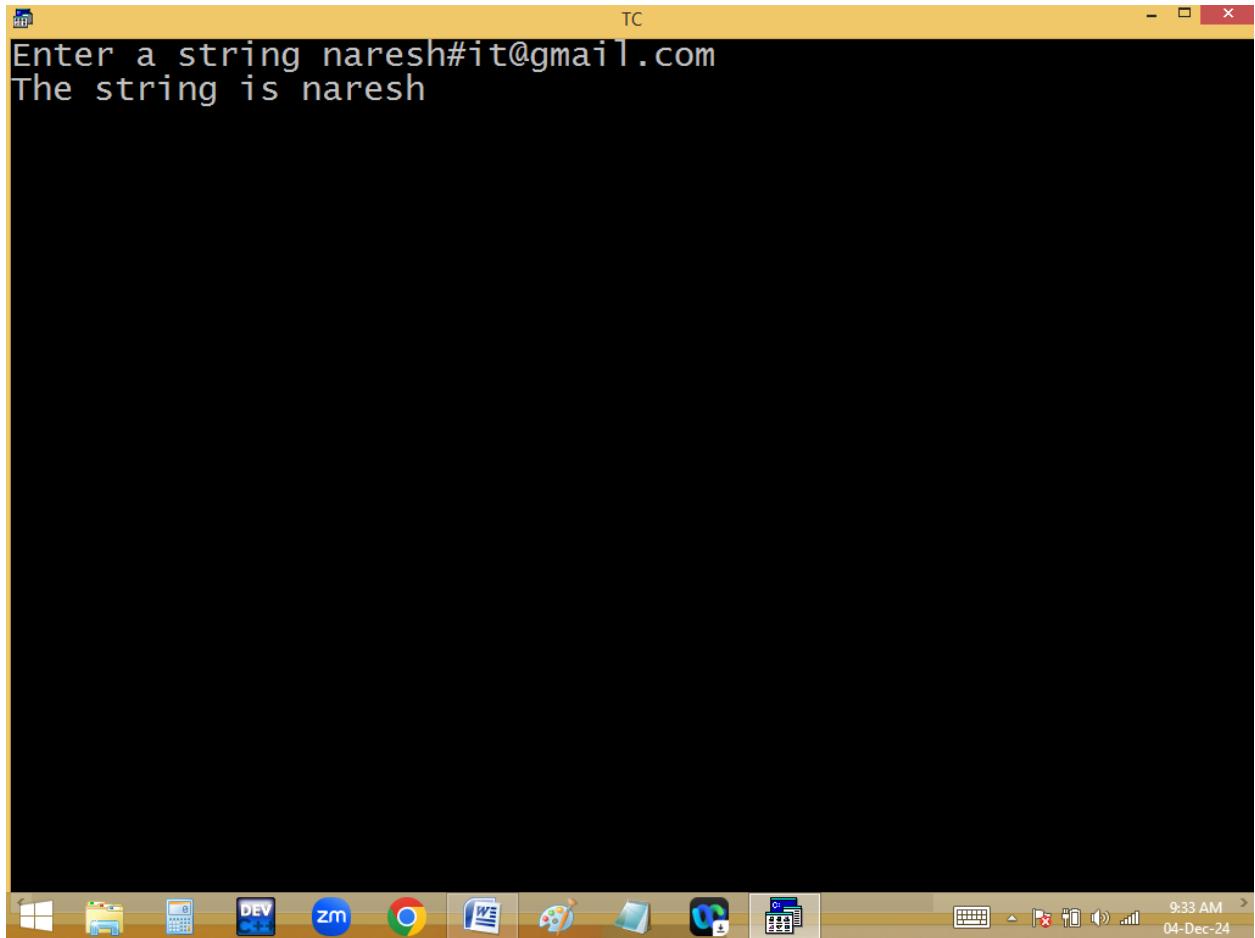
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:33 AM >
04-Dec-24







TC

File Edit Run Compile Project Options Debug

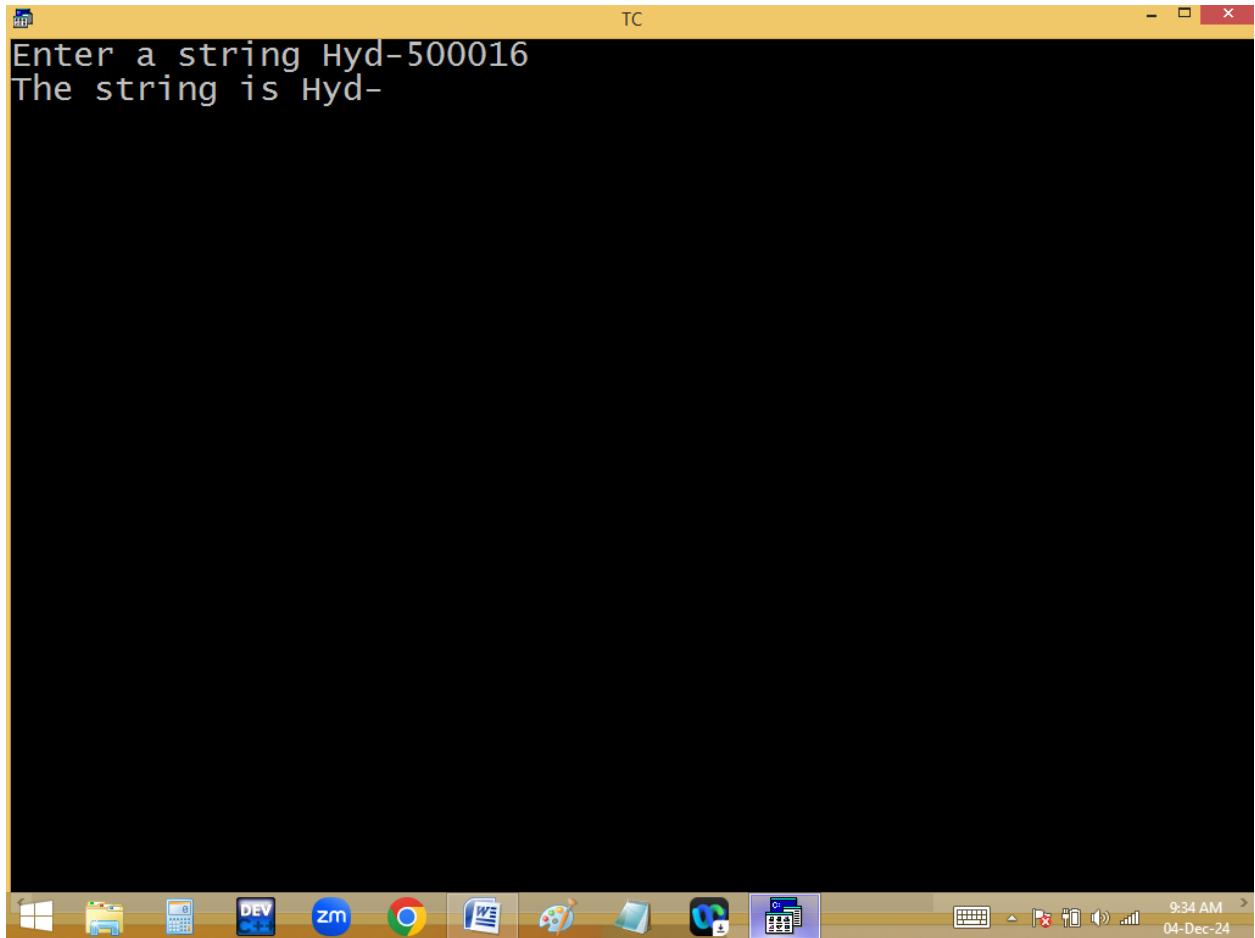
Line 7 Col 41 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[^\n]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:34 AM >
04-Dec-24



TC

File Edit Run Compile Project Options Debug

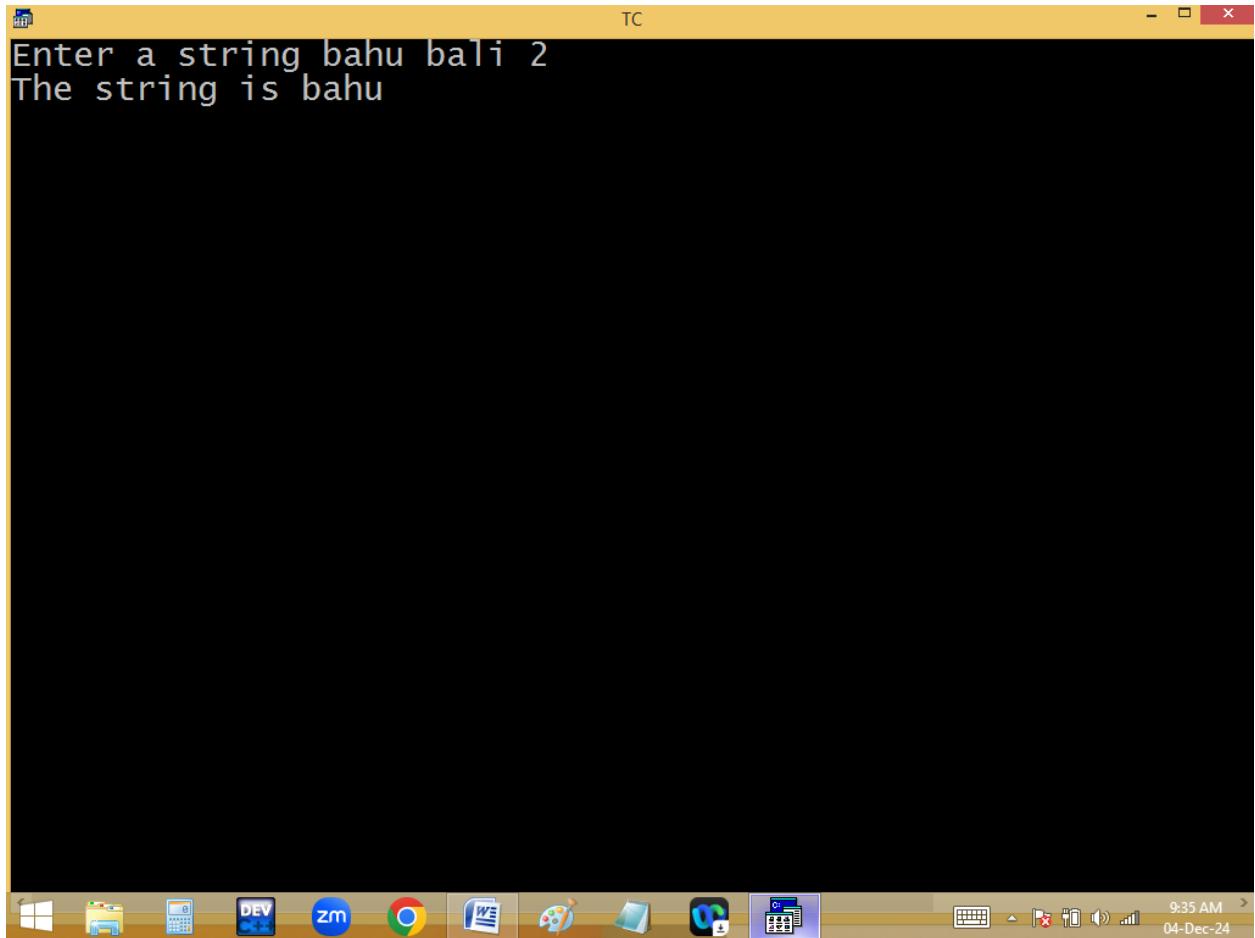
Line 7 Col 45 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[^\09 A-Z]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:35 AM >
04-Dec-24



```
TC
Enter a string James Bond 007
The string is
-
```



The taskbar shows various pinned application icons, including File Explorer, Task View, Edge, Google Chrome, Microsoft Word, Paint, Microsoft Edge, File Explorer again, and File Explorer once more. The system tray displays the date and time (9:36 AM, 04-Dec-24) and standard connectivity icons.

TC

File Edit Run Compile Project Options Debug

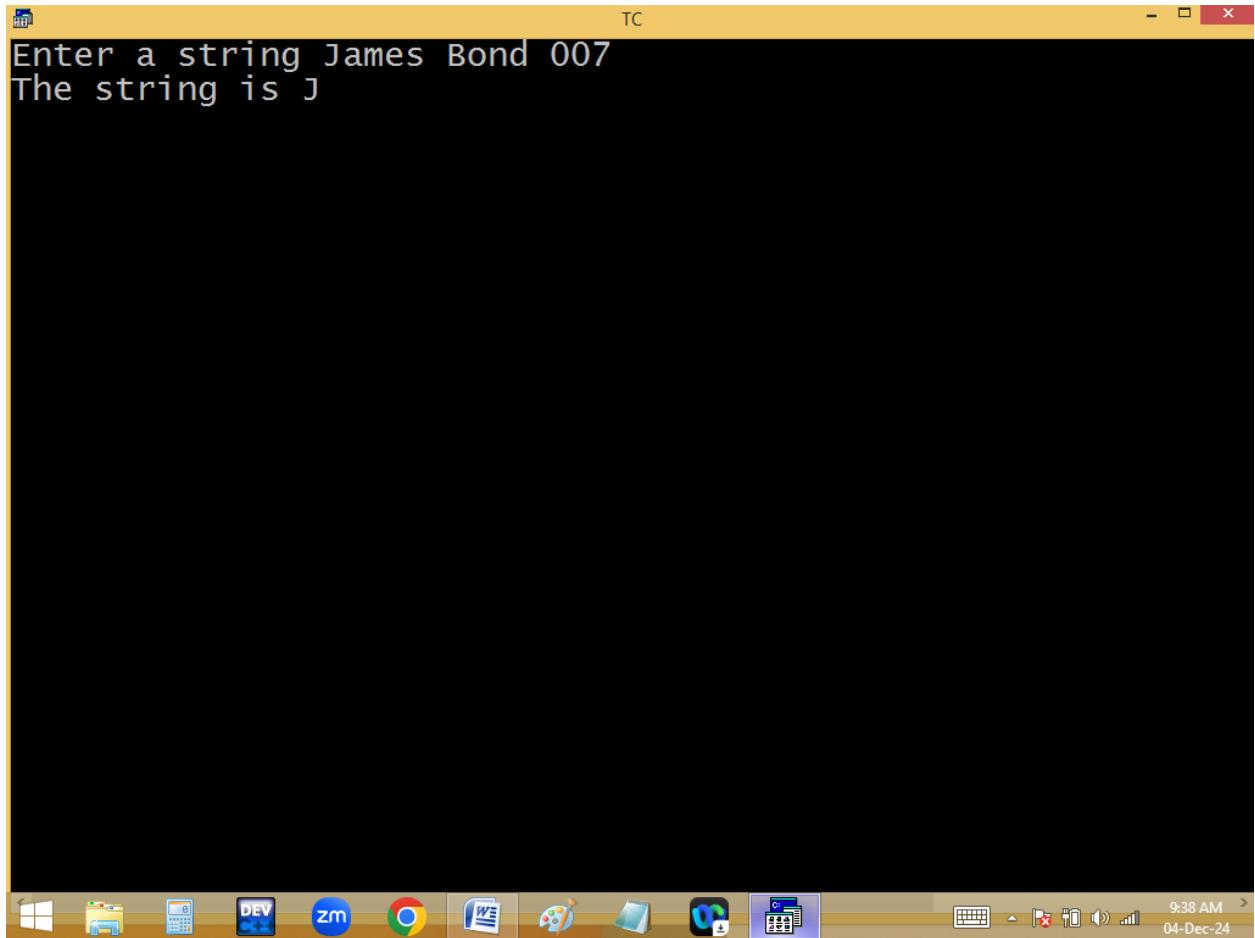
Line 7 Col 37 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[0-9 A-Z]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:38 AM >
04-Dec-24



```
TC
Enter a string ANUSHKA
The string is ANU
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the output of a program. The taskbar at the bottom contains icons for various applications including File Explorer, Edge, and several pinned icons. The system tray shows the date and time as '04-Dec-24' and '9:38 AM'.

TC

File Edit Run Compile Project Options Debug

Line 7 Col 40 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[0-9]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:39 AM >
04-Dec-24

```
TC
Enter a string hyd-16
The string is
```

TC

File Edit Run Compile Project Options Debug

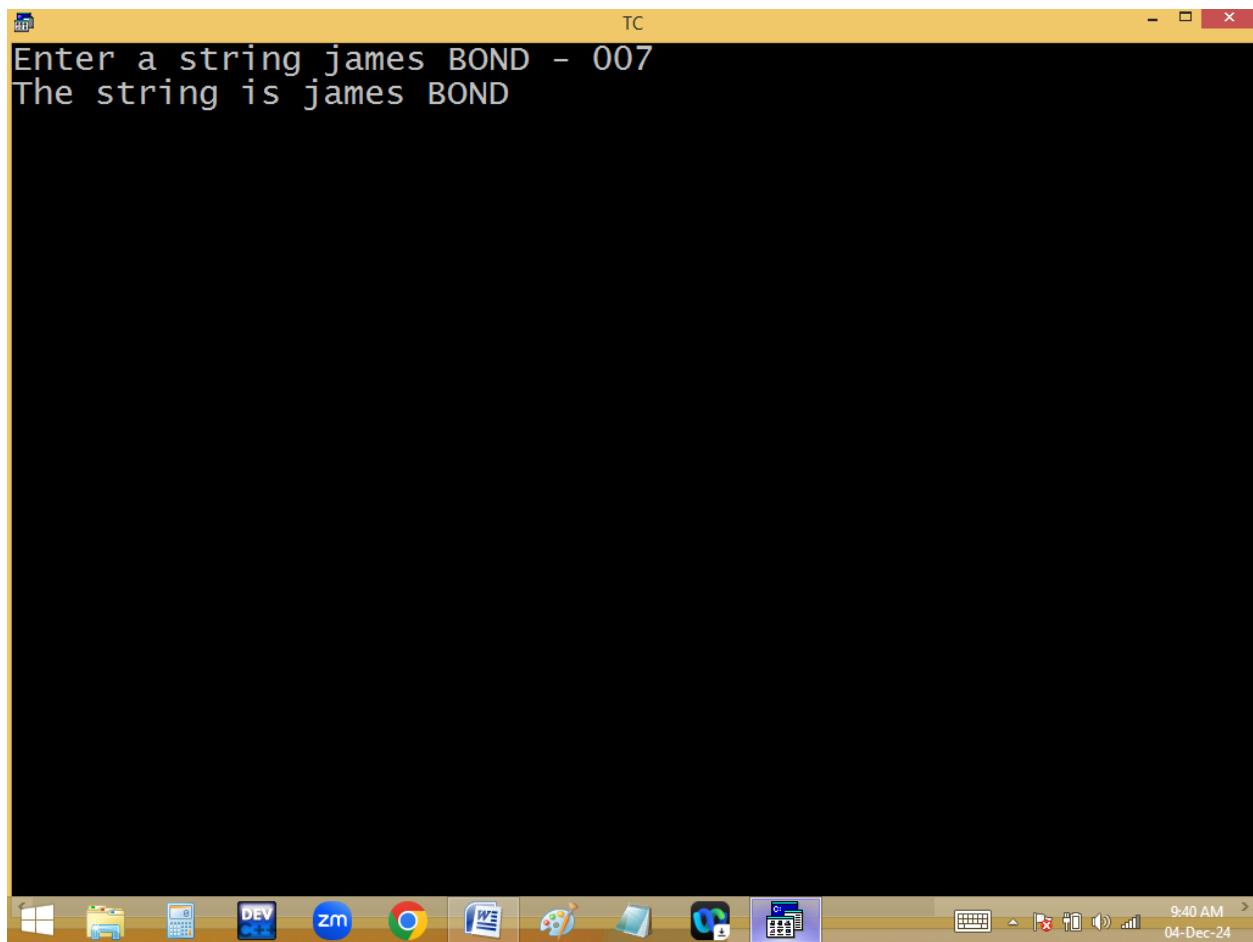
Line 7 Col 48 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
clrscr();
printf("Enter a string "); scanf("%[0-9 a-z A-Z]",s);
printf("The string is ");puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:40 AM >
04-Dec-24



Reading and printing multiple strings:

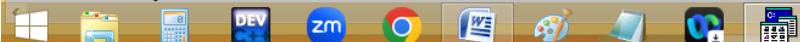
TC

File Edit Run Compile Project Options Debug

Line 12 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[5][100]; int i;
clrscr();
puts("Enter 5 names ");
for(i=0;i<5;i++)gets(s[i]);
puts("NAMES");
puts("*****");
for(i=0;i<5;i++)puts(s[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:42 AM >
04-Dec-24

```
TC
Enter 5 names
surya kumar yadav
virat kohli
jaspreeth bhoomra
rohit sharma
subhman gill
NAMES
*****
surya kumar yadav
virat kohli
jaspreeth bhoomra
rohit sharma
subhman gill
```

Finding string length and reverse string using user defined program:

TC

File Edit Run Compile Project Options Debug

Line 14 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100]; int i;
clrscr();
puts("Enter the string ");gets(s);
for(i=0;s[i]!='\0';i++) /* strlen() */
{
}
printf("Length=%d\n",i);
printf("Reverse ");
while( i ) printf("%c", s[--i]); /* strrev() */
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:51 AM >
04-Dec-24

```
TC
Enter the string
RamA
Length=4
Reverse AmaR
```

The image shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the output of a program that prompts for a string, calculates its length, and prints it reversed. Below the terminal is a standard Windows taskbar. On the taskbar, from left to right, are icons for File Explorer, Task View, Start, Microsoft Edge, Microsoft Word, Microsoft Paint, File Explorer again, File Explorer, and File Explorer. To the right of these pinned icons are several other pinned application icons, including OneDrive, Mail, Photos, and the Control Panel. On the far right of the taskbar, the system tray displays the date and time (9:51 AM, 04-Dec-24), battery status, signal strength, and volume level.

```
TC
Enter the string
RamU
Length=4
Reverse UmaR
```

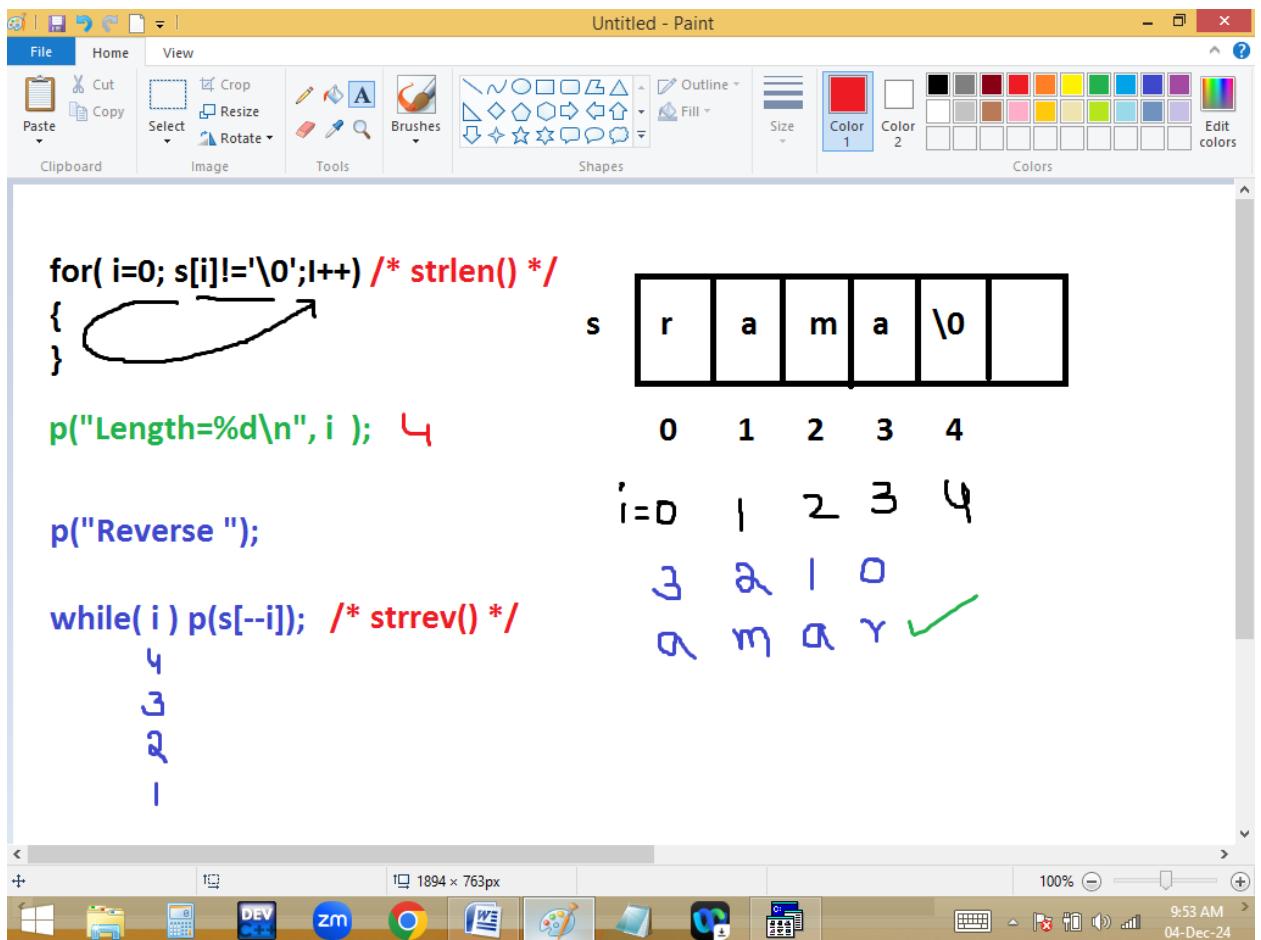


The screenshot shows a Windows desktop environment. A window titled 'TC' is open, displaying a simple program output. Below the window is a standard Windows taskbar. The taskbar features several pinned icons, including the Start button, File Explorer, Task View, Edge browser, File Explorer, Paint 3D, File Explorer, and File Explorer. On the right side of the taskbar, there are system status icons for battery level, signal strength, and volume, along with the current date and time (9:52 AM, 04-Dec-24).

```
TC
Enter the string
NaYaN TharA
Length=11
Reverse ArahT NaYaN_
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying a program's output. The taskbar at the bottom features several pinned icons, including File Explorer, Task View, Edge browser, File History, Paint 3D, File Cabinet, and Task Scheduler. The system tray shows the date and time as '9:52 AM 04-Dec-24'.



TC

File Edit Run Compile Project Options Debug

Line 11 Col 20 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100]; int i;
clrscr();
puts("Enter the string ");gets(s);
for(i=0;s[i];i++); /* strlen() */
printf("Length=%d\n",i);
printf("Reverse ");
while( i ) putchar(s[--i]); /* strrev() */
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:55 AM >
04-Dec-24

TC

```
Enter the string
NitiN VarmA
Length=11
Reverse AmraV NitiN
```

Windows taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, File Explorer, Paint, Edge, File Explorer, File Explorer.

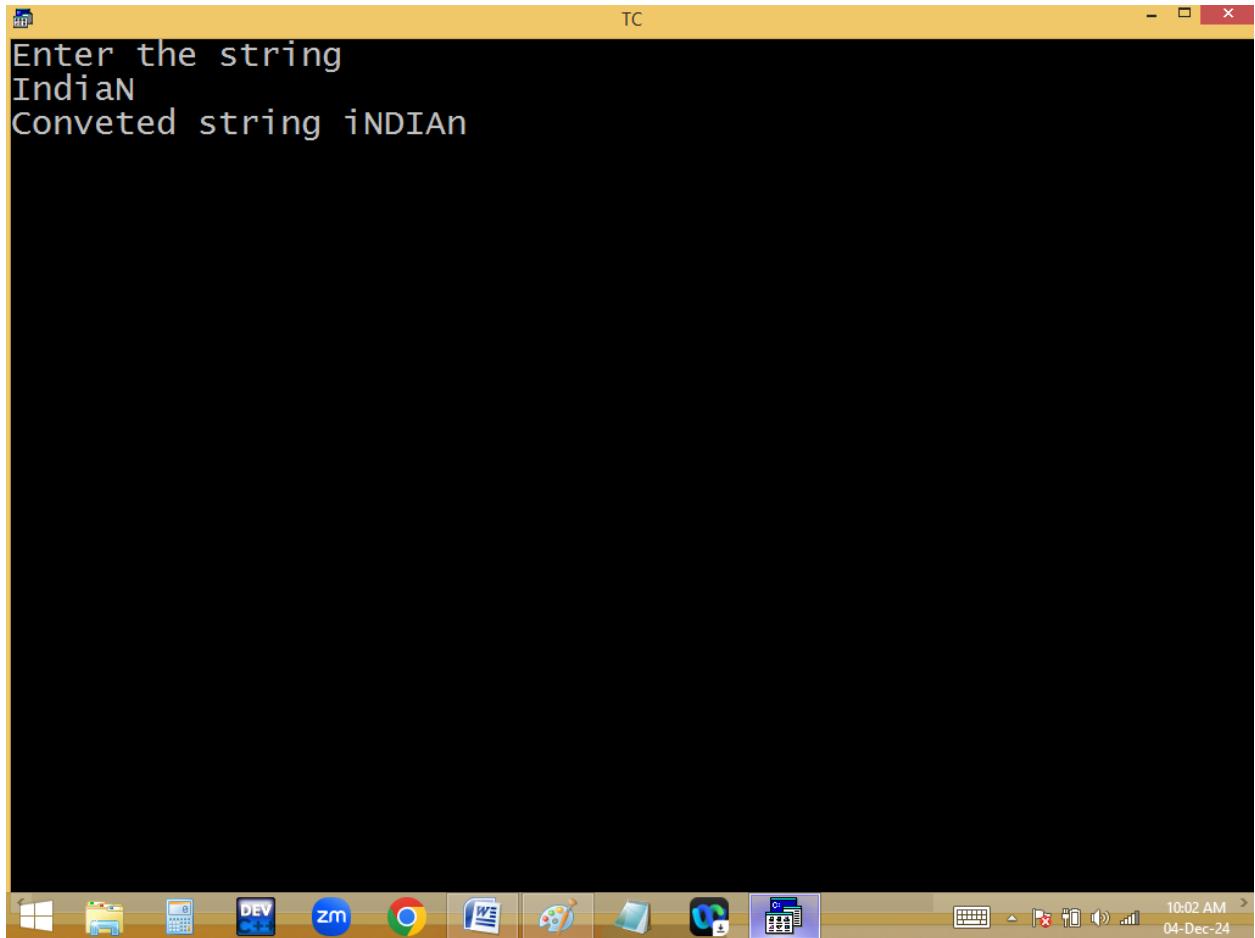
9:55 AM >
04-Dec-24

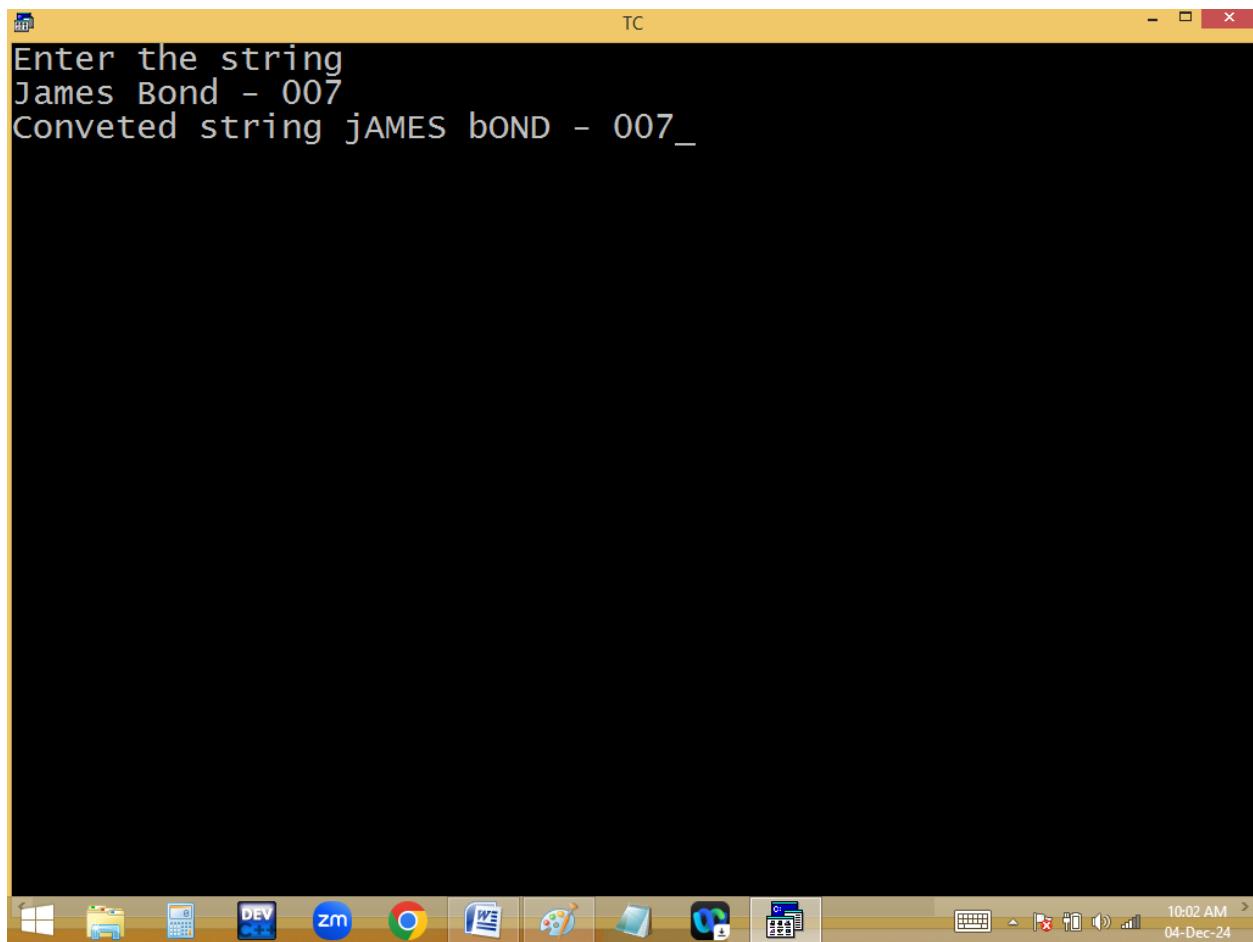
Lower to upper / upper to lower:

The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 11, Col 54. The code area contains a C program that reads a string from the user, converts it to uppercase, and then prints it back. The F1 key is highlighted in red.

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char s[100]; int i;
    clrscr();
    puts("Enter the string ");gets(s);
    for(i=0;s[i]!='\0';i++)
    {
        if(s[i]>='a'&&s[i]<='z')s[i]-=32; /* strupr() */
        else if(s[i]>='A'&&s[i]<='Z')s[i]+=32; /* strlwr() */
    }
    printf("Converted string %s",s);
    getch();
}
```

The F1 key is highlighted in red at the bottom of the screen, along with other function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10. The system tray at the bottom right shows the date and time: 10:02 AM, 04-Dec-24.





The screenshot shows a Windows desktop environment. At the top, there's a taskbar with various icons for applications like File Explorer, Edge, and File Manager. The main focus is a terminal window titled "TC" with a black background. Inside the terminal, the following text is displayed:

```
Enter the string
James Bond - 007
Conveted string jAMES bOND - 007_
```

The terminal window has standard window controls (minimize, maximize, close) at the top right. The desktop background is visible behind the taskbar.

Using predefined functions:

TC

File Edit Run Compile Project Options Debug

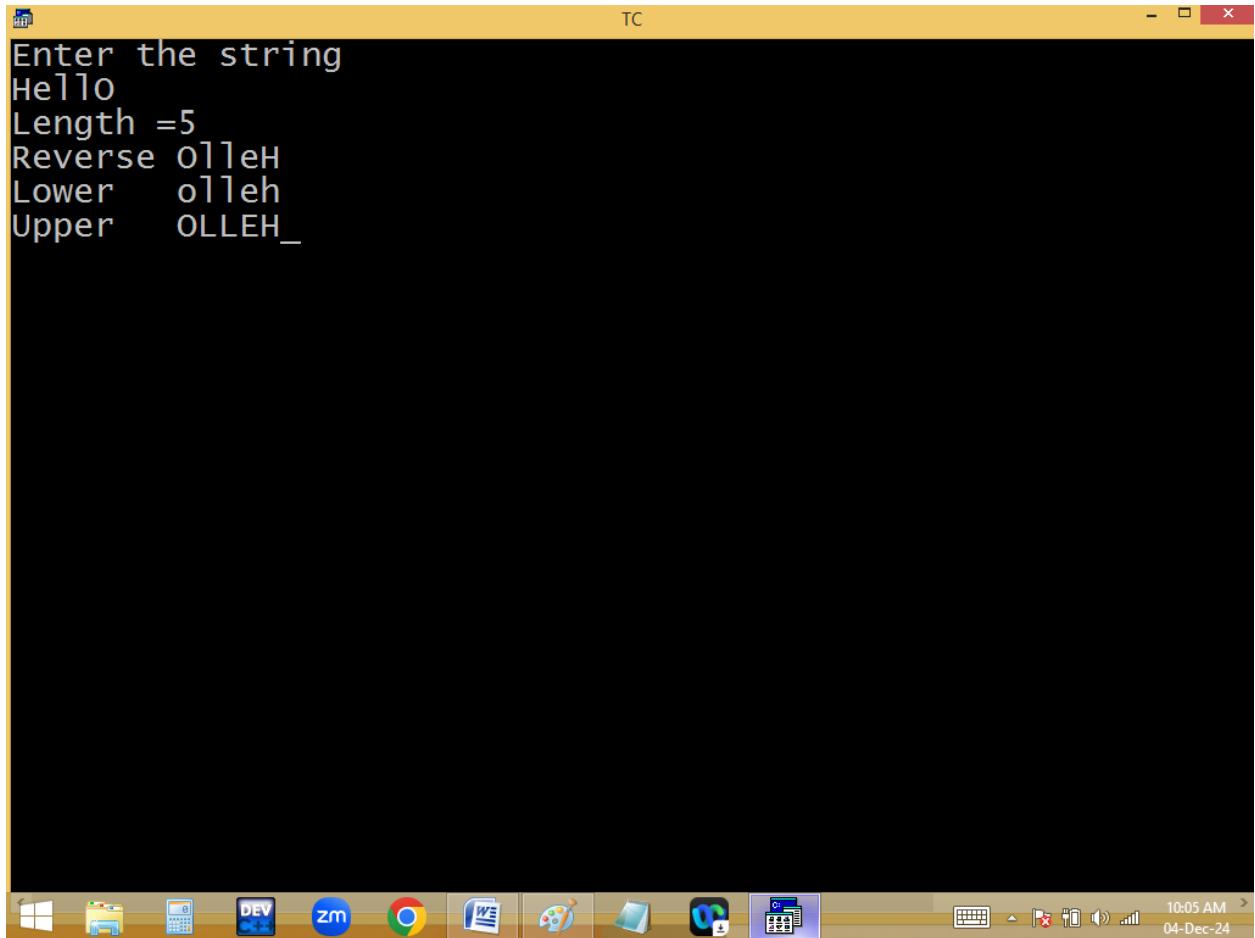
Line 12 Col 32 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char s[100];
clrscr();
puts("Enter the string ");gets(s);
printf("Length =%d\n",strlen(s));
printf("Reverse %s\n",strrev(s));
printf("Lower %s\n",strlwr(s));
printf("Upper %s",strupr(s));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:05 AM >
04-Dec-24



Enter the string
Hello
Length =5
Reverse olleh
Lower olleh
Upper OLLEH_

Finding no of vowels, consonants, digits, special char's and spaces in given string.

Bahu Bali – 2

Output:

Vowels – 4

Consonants – 4

Digits – 1

Spaces = 3

Special - 1

TC

File Edit Run Compile Project Options Debug

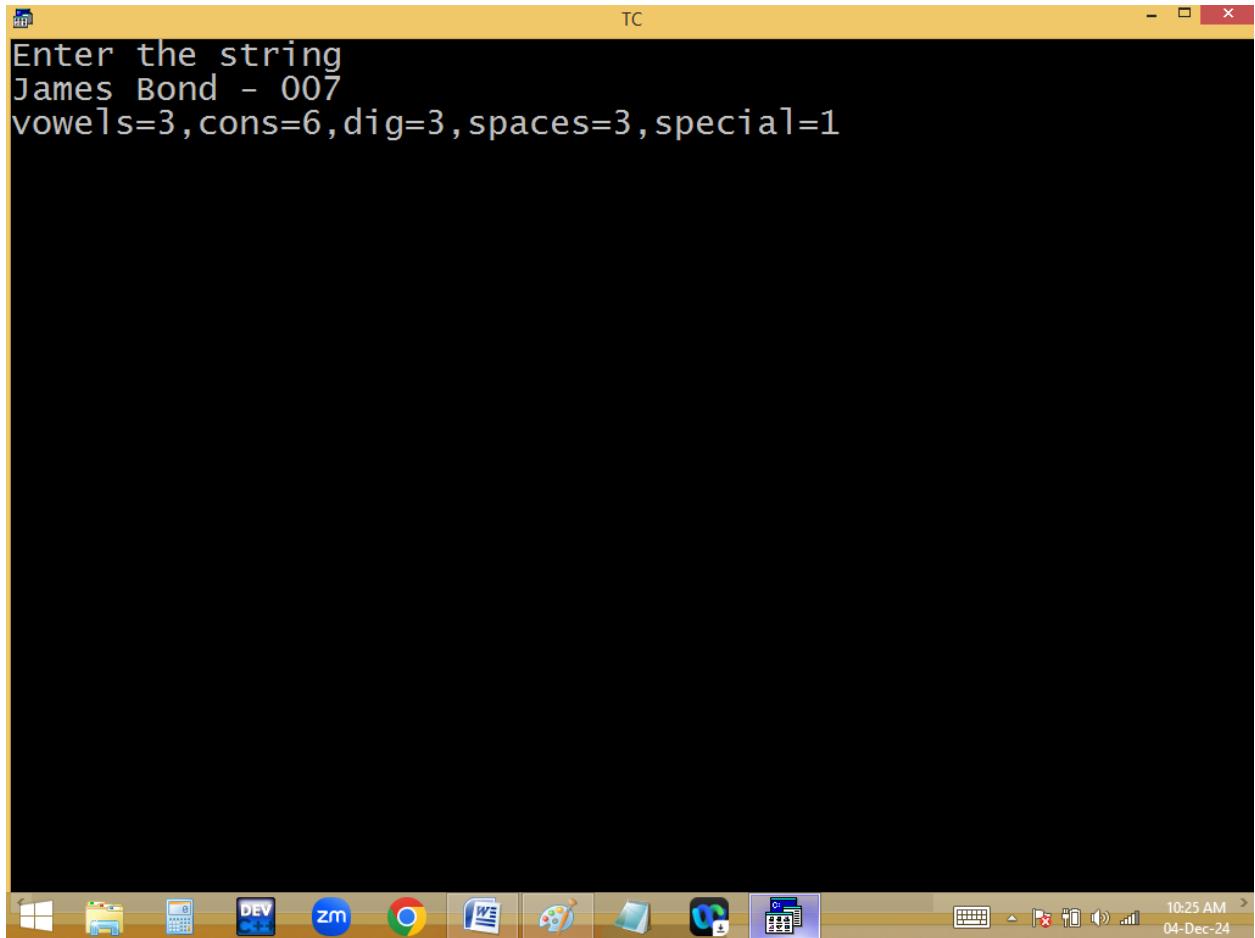
Line 5 Col 35 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char s[100]; int i,v,c,d,spa,spe; clrscr();
    puts("Enter the string ");gets(s);
    for(v=c=d=spa=spe=i=0;s[i]!='\0';i++)
    {
        if(s[i]>='A'&&s[i]<='Z')s[i]+=32; /* strlwr*/
        if(s[i]>='a' && s[i]<='z')
        {
            if(s[i]=='a'||s[i]=='e'||s[i]=='i'||s[i]=='o'||s[i]=='u')
                v++; else c++;
        }
        else if(s[i]>='0'&&s[i]<='9')d++;
        else if(s[i]==' ')spa++;
        else spe++;
    }
    printf("vowels=%d,cons=%d,dig=%d,spaces=%d,special=%d",
    v,c,d,spa,spe);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:25 AM >
04-Dec-24



The screenshot shows a Windows desktop environment. In the center is a command-line window titled "TC". The window contains the following text:

```
Enter the string  
vEdA  
vowels=2 ,cons=2 ,dig=0 ,spaces=0 ,special=0_
```

At the bottom of the screen is the Windows taskbar, which includes icons for various applications like File Explorer, Edge, and Google Chrome, along with system status icons for battery, signal, and volume. The system tray shows the date and time as "10:26 AM 04-Dec-24".

Using predefined functions:

TC

File Edit Run Compile Project Options Debug

Line 16 Col 12 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
#include<ctype.h>
void main()
{
    char s[100]; int i,v,c,d,spa,spe; clrscr();
    puts("Enter the string ");gets(s); strlwr(s);
    for(v=c=d=spa=spe=i=0;s[i]!='\0';i++)
    {
        if(isalpha(s[i]))
        {
            if(s[i]=='a'||s[i]=='e'||s[i]=='i'||s[i]=='o'||s[i]=='u')v++;
            else if(isdigit(s[i]))d++;
            else if(isspace(s[i]))spa++;
            else spe++;
        }
    }
    printf("vowels=%d,cons=%d,dig=%d,spaces=%d,special=%d",
    v,c,d,spa,spe);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:33 AM >
04-Dec-24

```
Enter the string
Bahu Bali - 2
vowels=4,cons=4,dig=1,spaces=3,special=1
```

Replace lower/upper/digits/spaces/special with @/#/\$/*/~

TC

File Edit Run Compile Project Options Debug

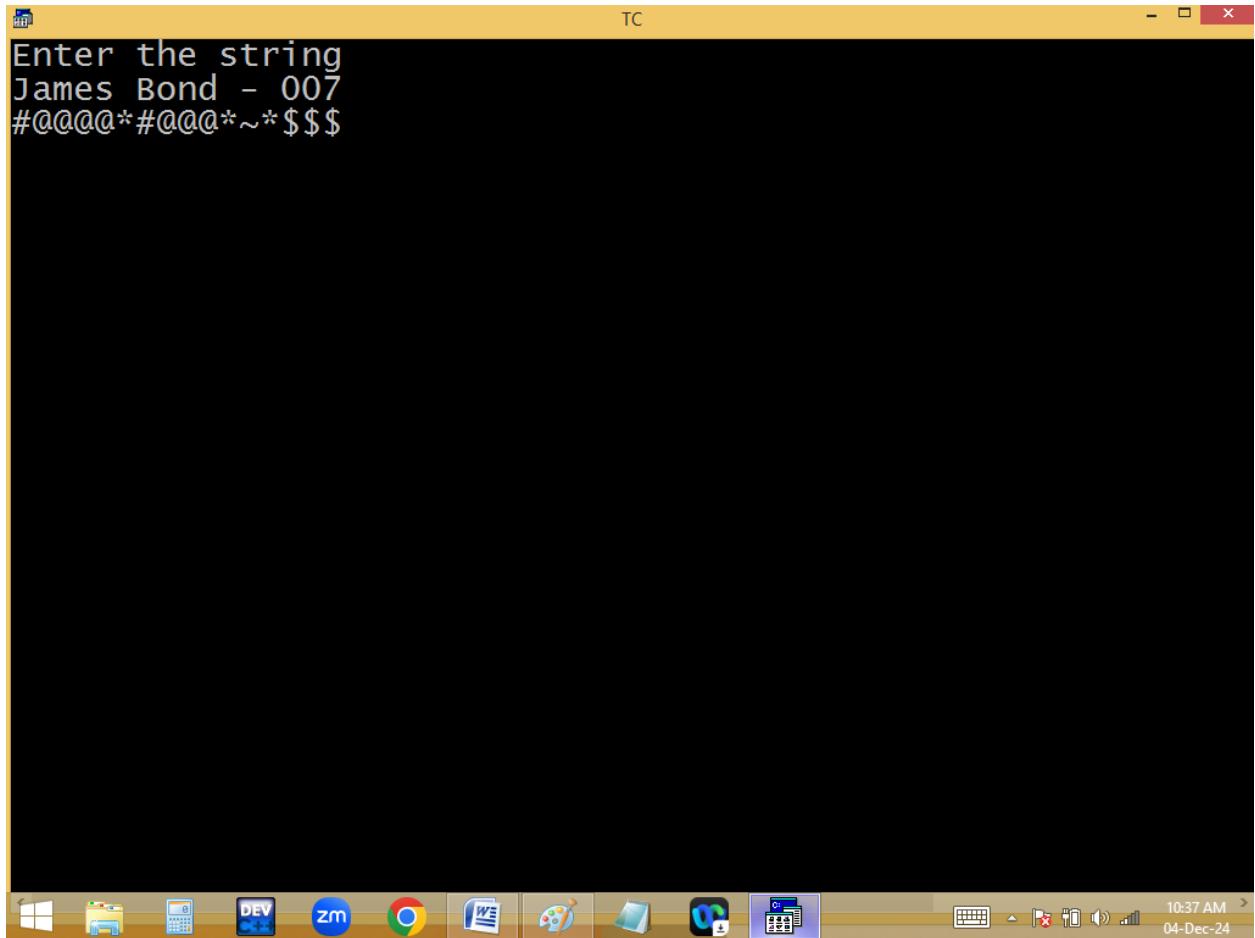
Line 13 Col 10 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100]; int i,v,c,d,spa,spe; clrscr();
puts("Enter the string ");gets(s);
for(i=0;s[i]!='\0';i++)
{
if(s[i]>='a' && s[i]<='z')s[i]='@';
else if(s[i]>='A' && s[i]<='Z')s[i]='#';
else if(s[i]>='0' && s[i]<='9')s[i]='$';
else if(s[i]==' ')s[i]='*';
else s[i]='~';
}
printf(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:37 AM 04-Dec-24



TC

File Edit Run Compile Project Options Debug

Line 7 Col 36 Insert Indent Tab Fill Unindent * E

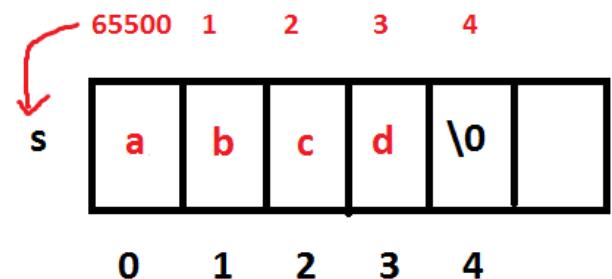
```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100]; int i;
clrscr();
printf("Enter a string "); gets(s);
for(i=0;s[i]!='\0';i++)puts(s+i);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:41 AM >
04-Dec-24

```
TC
Enter a string Bharathi
Bharathi
harathi
arathi
rathi
athi
thi
hi
i
```



```
for( i=0; s[i]!='\0'; i++ ) puts( s+i );
```

↓

65500+0*1=65500 to \0 ==> abcd
65500+1*1=65501 to \0 ==> bcd
65500+2*1=65502 to \0 ==> cd
65500+3*1=65503 to \0 ==> d
65500+4*1=65504 ==> \0 != \0 ==> False

Home work:

1.

abcd

abc

ab

a

2. sachin ramesh tendulkar → s r t

Kabhi Kushi Kabhi Ghum – kkkg

Ranam Raudram Rudhiram – RRR

3. Jaanu I miss you → 4 words

TC

File Edit Run Compile Project Options Debug

Line 12 Col 1 Insert Indent Tab Fill Unindent E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i;
clrscr();
printf("Enter the string "); gets(s);
for( i=0; s[i]!='\0';i++); /* strlen */
for( ; i>0; i--, s[i]='\0')puts(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



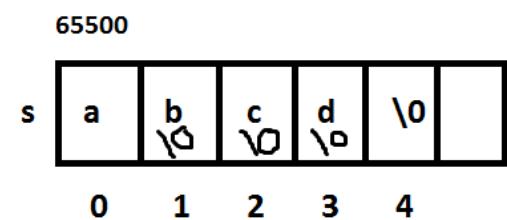
9:32 AM >
05-Dec-24

TC

```
Enter the string abcd
abcd
abc
ab
a
```

9:32 AM >
05-Dec-24

```
for( i=0; s[i]!='\0'; i++ ) ; len = 4
for( ; i>0; i--, s[i]='\0' ) puts(s);
```



65500 to \0 ==> abcd

4

65500 to \0 ==> abc

3

65500 to \0 ==> ab

2

65500 to \0 ==> a

1
0

Method2:

TC

File Edit Run Compile Project Options Debug

Line 14 Col 14 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i,j;
clrscr();
printf("Enter the string "); gets(s);
for(i=0;s[i]!='\0';i++); /* strlen */
for(i--; i>=0; i--)
{
for( j=0; j<=i;j++)printf("%c",s[j]);
printf("\n");
}
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

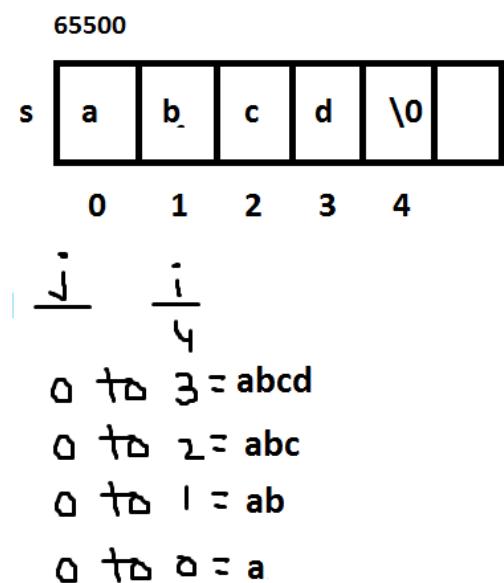


9:37 AM >
05-Dec-24

```
TC
Enter the string asha
asha
ash
as
a
```

Windows taskbar icons: File Explorer, Task View, Taskbar settings, ZM, Google Chrome, File Explorer, Paint, File Explorer, Task View. Date and time: 9:37 AM, 05-Dec-24.

```
for( i=0; s[i]!='\0'; i++ ) ; len = 4
    ↗
for( i--; i>=0; i-- )
{
    ↗
    for( j=0; j<=i; j++ ) p(s[ j ]);
    p("\n");
}
```



Finding no. of words:

Jaanu I miss you → 4 words

TC

File Edit Run Compile Project Options Debug

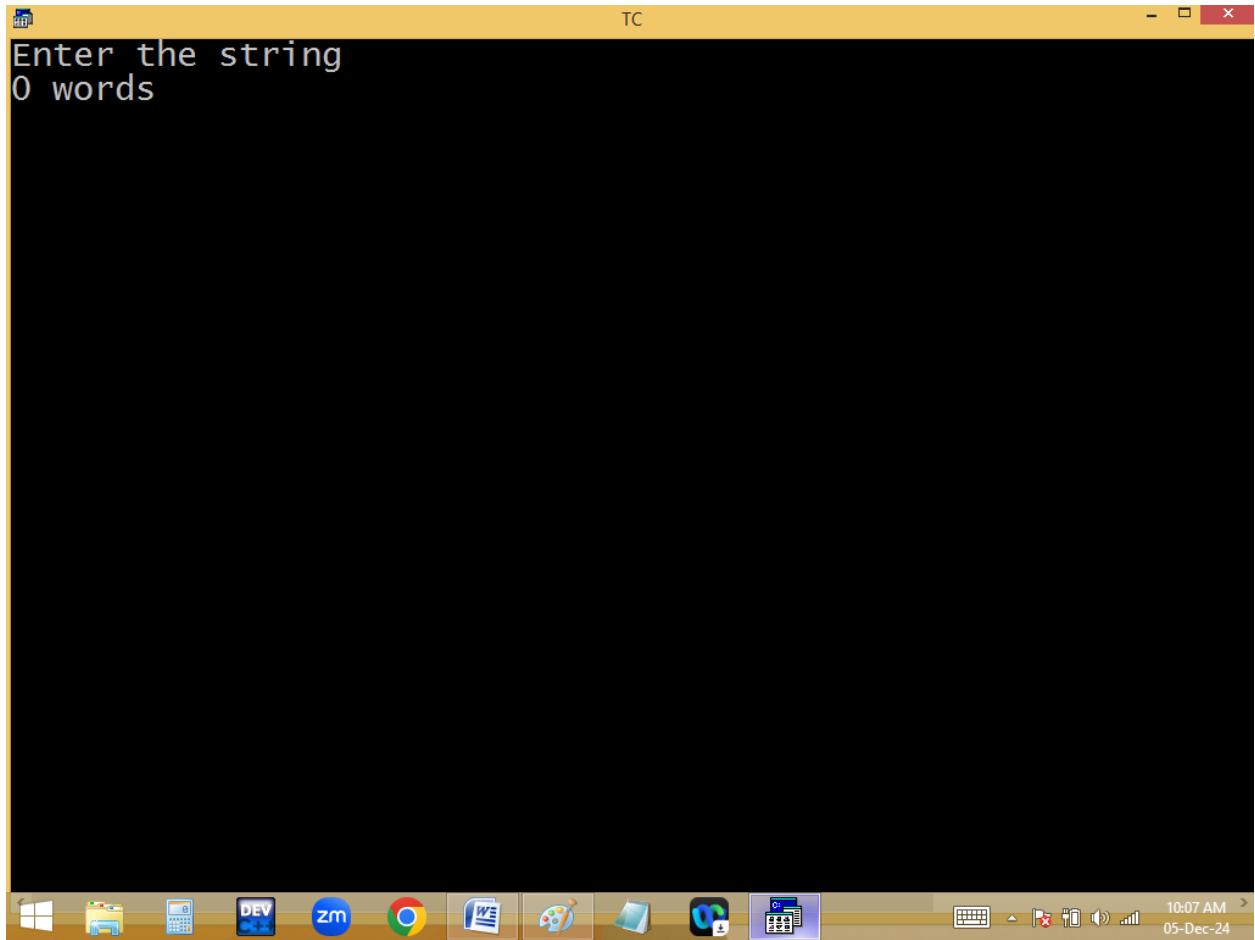
Line 12 Col 19 Insert Indent Tab Fill Unindent * E

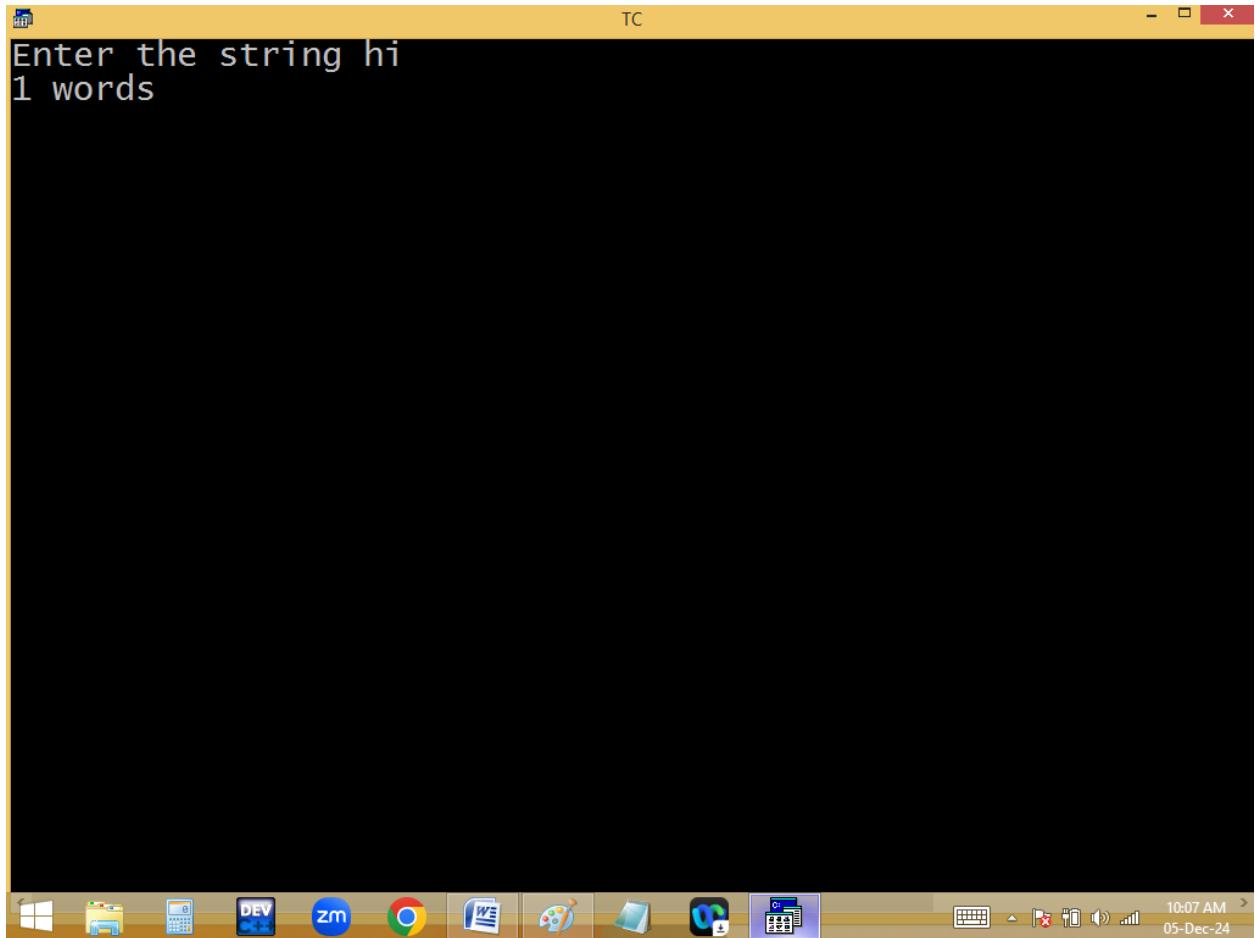
```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i,w=1;
clrscr();
printf("Enter the string "); gets(s);
for(i=0;s[i]!='\0';i++)if(s[i]==' '&&s[i+1]!=' ')w++;
if(s[0]==' ')w--;
if(s[i-1]==' ')w--;
if(s[0]=='\0')w--;
printf("%d words",w);
getch();
}
```

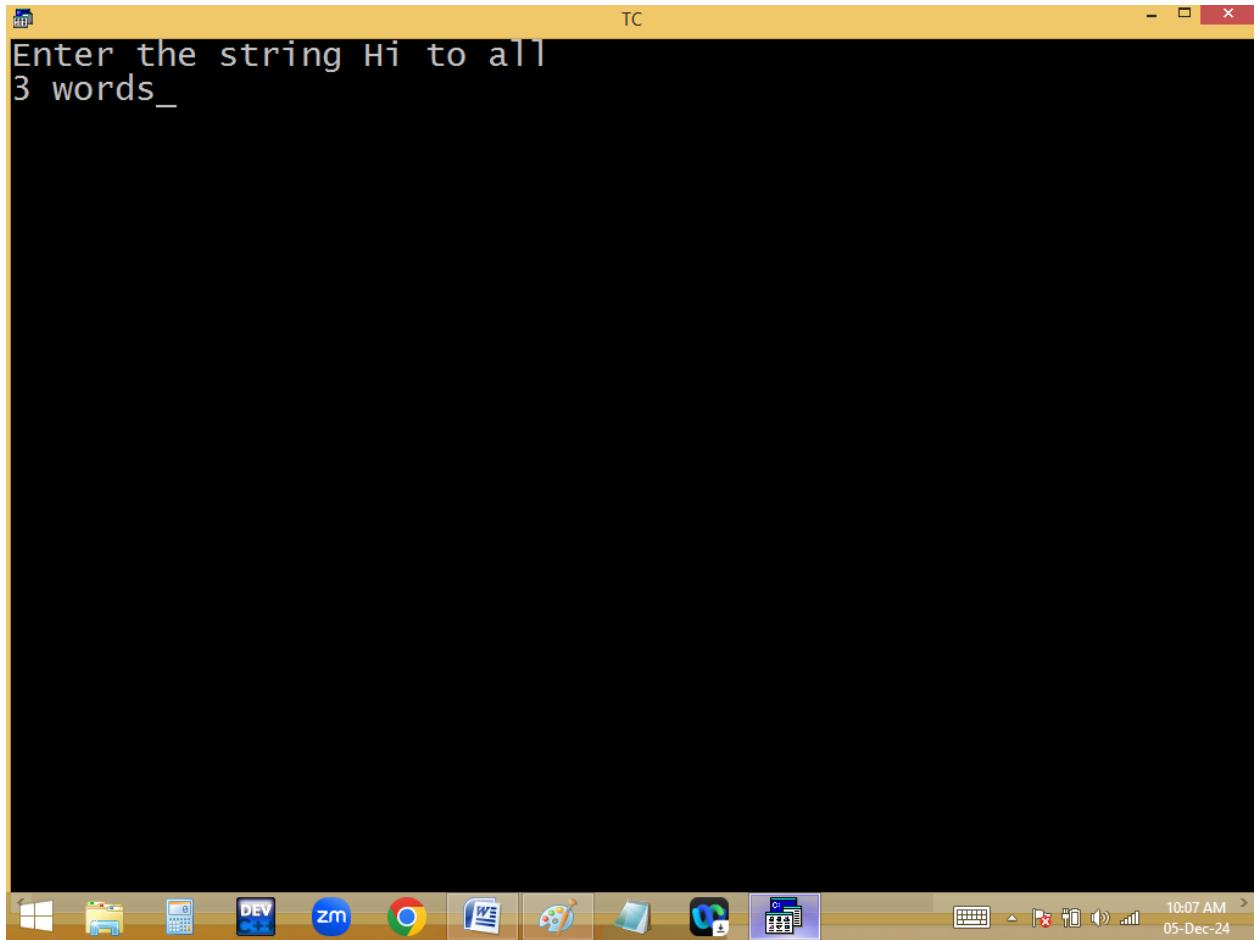
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:07 AM >
05-Dec-24







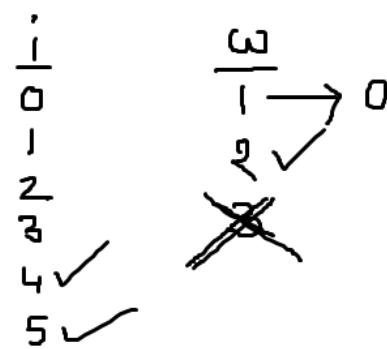
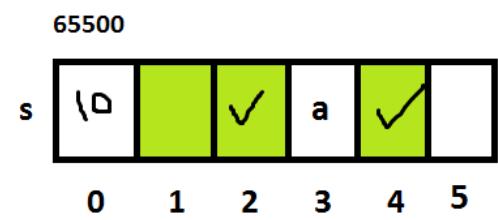
TC

```
Enter the string      jack    richer
2 words
```

Windows taskbar icons: File Explorer, Task View, Calculator, DEV, zm, Google Chrome, File Explorer, Paint, Edge, File Explorer, Task View.

10:07 AM >
05-Dec-24

```
for( i=0; s[i]!='\0';i++)
if( s[i]=='' &&s[i+1]!=' ')w++;
if(s[i-1]==')w--;
if(s[0]==')w--;
p(w);
```



Title case [Capitalize Each Word]:

TC

File Edit Run Compile Project Options Debug

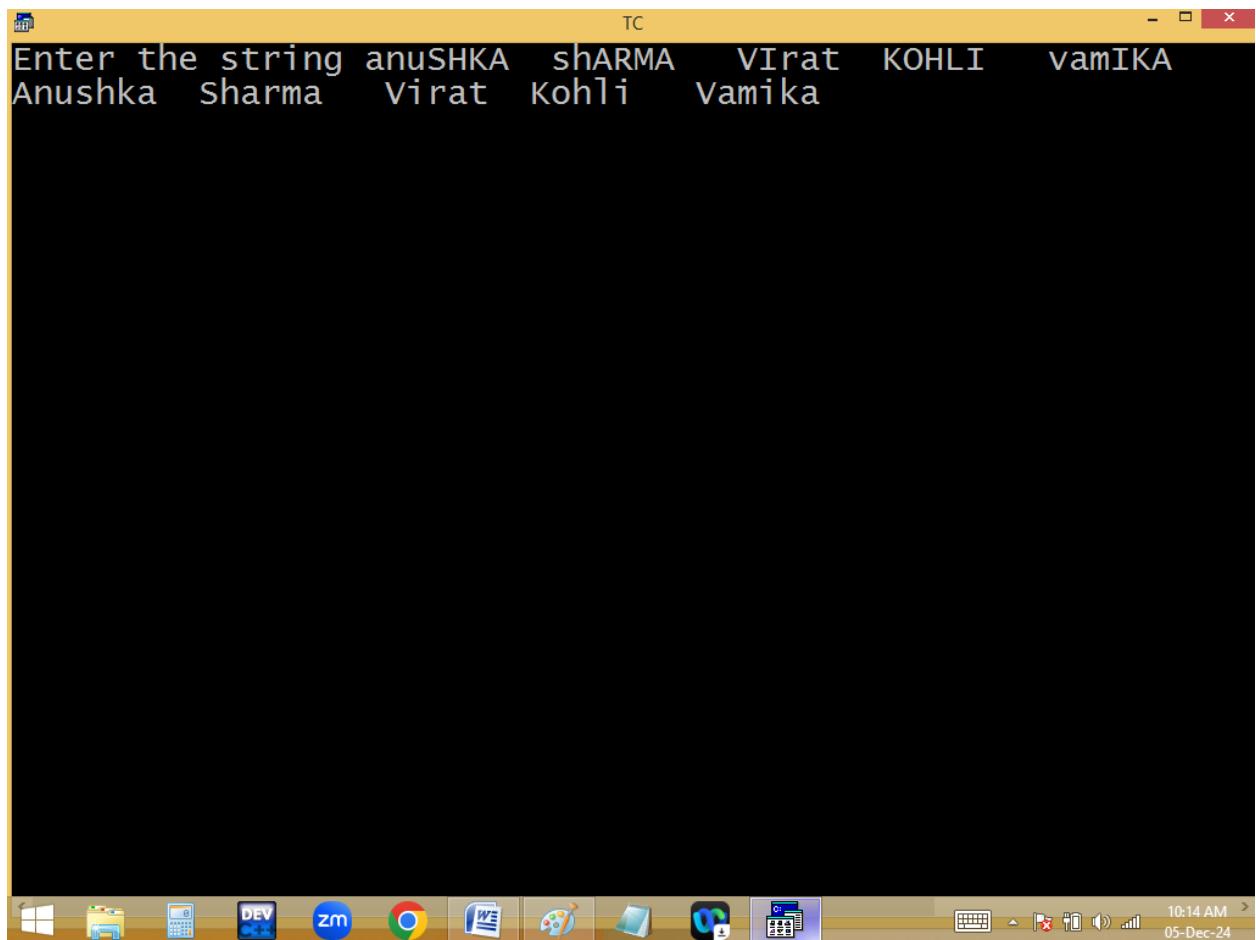
Line 14 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i,w=1;
clrscr();
printf("Enter the string "); gets(s);
for(i=0;s[i]!='\0';i++)
if(s[i]>='A'&&s[i]<='Z')s[i]+=32; /* lower */
if(s[0]>='a' && s[0]<='z')s[0]-=32;
for(i=1;s[i]!='\0';i++)
if(s[i]==' ' &&s[i+1]>='a' && s[i+1]<='z')s[i+1]-=32;
printf(s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:14 AM >
05-Dec-24



tOOGLE cASE:

TC

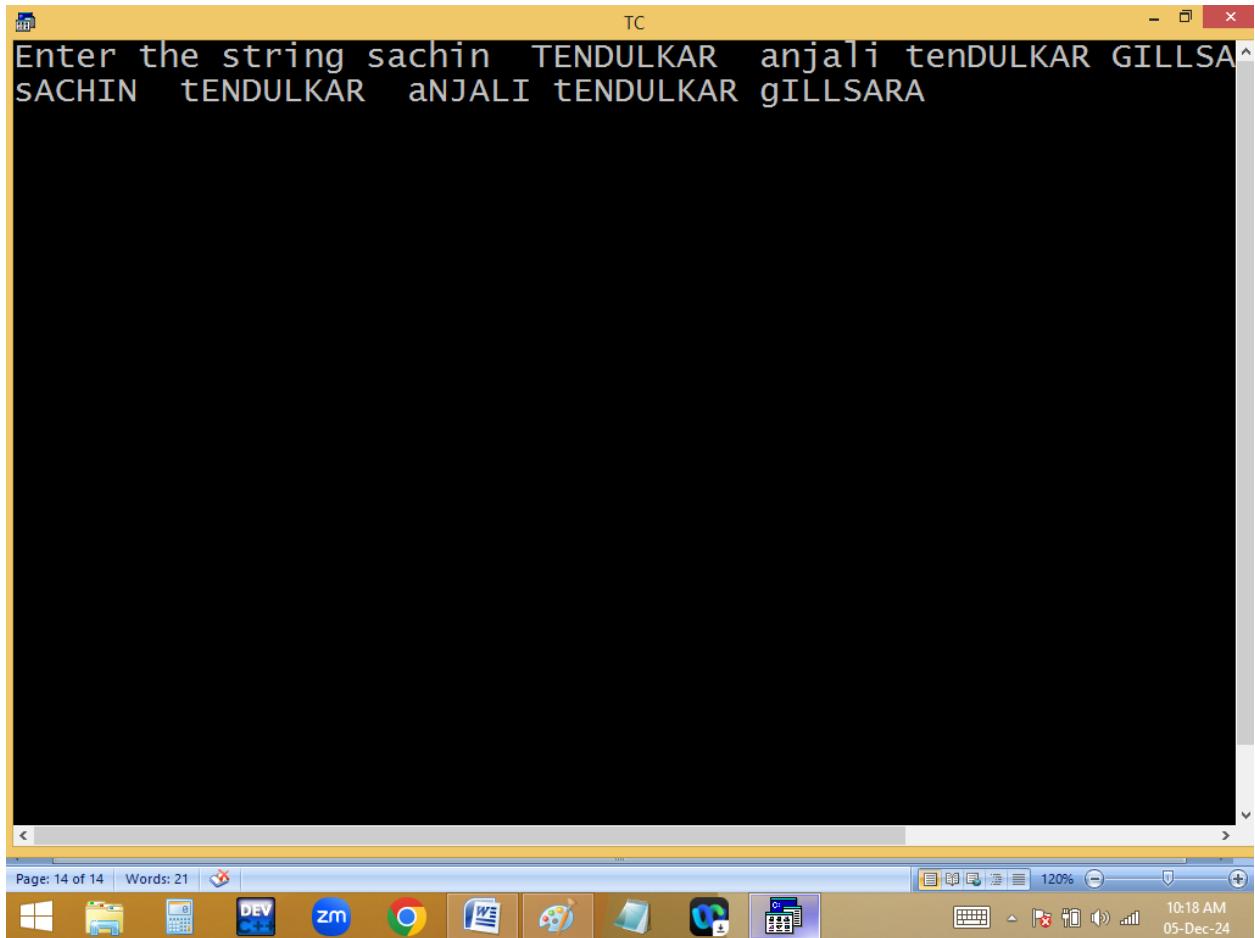
File Edit Run Compile Project Options Debug

Line 13 Col 49 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i,w=1;
clrscr();
printf("Enter the string "); gets(s);
for(i=0;s[i]!='\0';i++)
if(s[i]>='a' &&s[i]<='z')s[i]-=32; /* upper */
if(s[0]>='A' && s[0]<='Z')s[0]+=32;
for(i=1;s[i]!='\0';i++)
if(s[i]==' ' &&s[i+1]>='A' && s[i+1]<='Z')s[i+1]+=_32;
printf(s);
getch();
}
```

Page: 13 of 13 Words: 21

120% 10:18 AM 05-Dec-24



Sentense case:

TC

File Edit Run Compile Project Options Debug

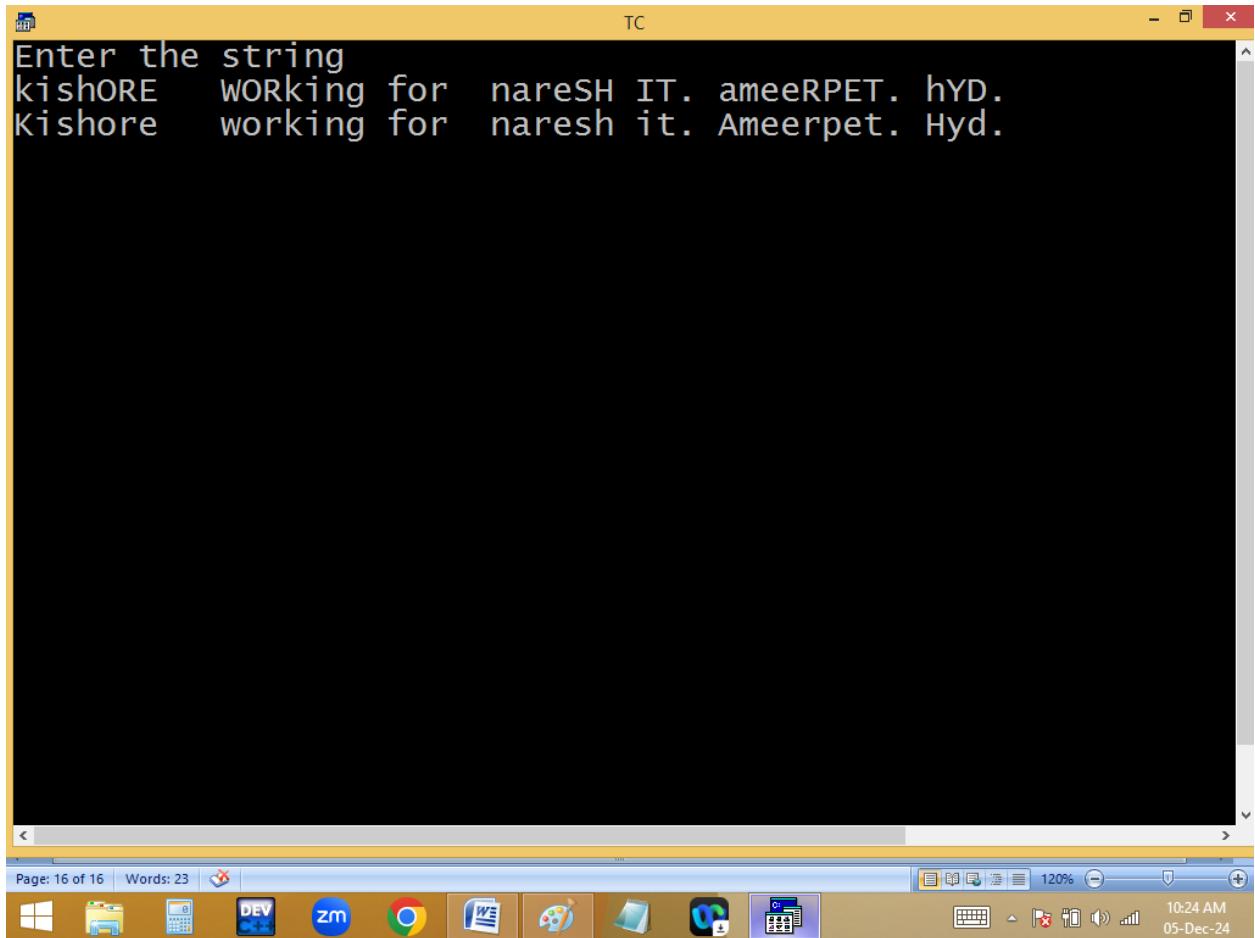
Line 8 Col 5 Insert Indent Tab Fill Unindent *

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100];
int i,w=1;
clrscr();
puts("Enter the string"); gets(s);
for(i=0;s[i]!='\0';i++)
if(s[i]>='A' &&s[i]<='Z')s[i]+=32; /* lower */
if(s[0]>='a' && s[0]<='z')s[0]-=32;
for(i=1;s[i]!='\0';i++)
if(s[i]== '.' &&s[i+1]== ' ' && s[i+2]>='a' && s[i+2]<='z')
s[i+2]-=32;
printf(s);
getch();
}
```

Page: 15 of 15 Words: 29

120% 10:23 AM 05-Dec-24

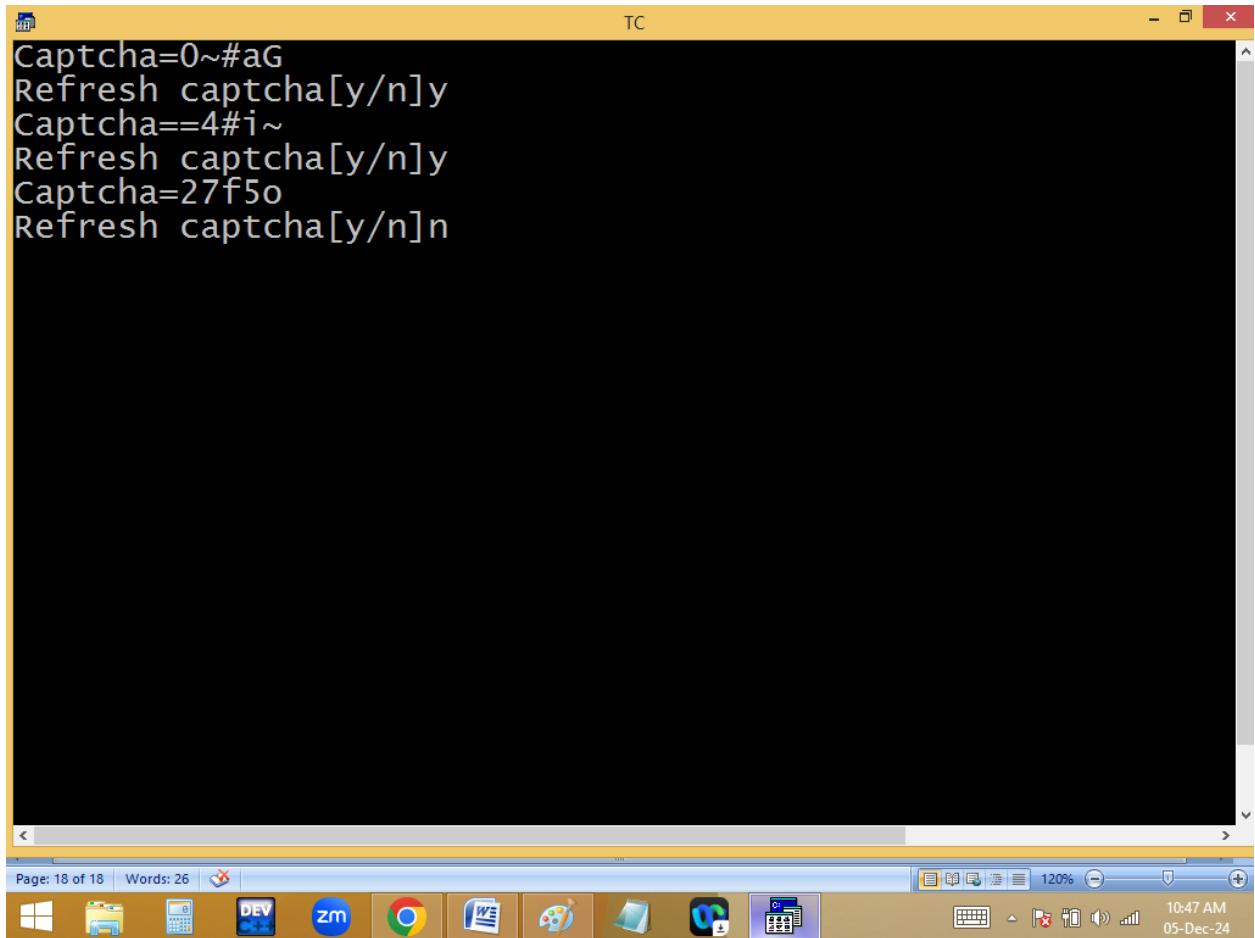




Captcha code generation:

The screenshot shows a Windows operating system desktop. In the center is a terminal window titled "TC" with a dark blue background. The window contains a C program for generating a CAPTCHA. The code includes #include directives for stdio.h, conio.h, and stdlib.h. It defines a main function that initializes a character array s[20] with a random string of characters. It then enters a loop where it generates a random number n (0, 1, or 2) and sets s[i] based on n. If n=0, s[i] is a random character between 97 and 123. If n=1, s[i] is a random character between 65 and 90. If n=2, s[i] is a random character between 48 and 57. Otherwise, s[i] is set to a random character from a predefined set sp. After generating the string, it prints it to the console and asks for user input to refresh. The terminal window has a standard Windows title bar with File, Edit, Compile, Project, Options, and Debug menus. The status bar at the bottom shows the current line (Line 21), column (Col 37), and some other options like Insert, Indent, Tab, Fill, Unindent, and *. The taskbar at the bottom of the screen displays icons for various applications including File Explorer, Task View, Calculator, DEV, ZM, Google Chrome, File Explorer again, Paint, File Explorer again, and Task View again. The system tray shows the date and time as 10:47 AM on 05-Dec-24.

```
#include<stdio.h> #include<conio.h> #include<stdlib.h>
void main()
{
char s[20],sp[]="~@#$*=",ch; int n,i;
clrscr();
while(1)
{
randomize();
for(i=0;i<5;i++)
{
n=random(4);
if(n==0)s[i]=random(26)+97;
else if(n==1)s[i]=random(26)+65;
else if(n==2)s[i]=random(10)+48;
else s[i]=sp[random(6)];
}s[i]='\0';
printf("Captcha=%s\n",s);flushall();
printf("Refresh captcha[y/n]");scanf("%c",&ch);
if(ch=='n'||ch=='N')break;
}
}
```



O T P Generation:

TC

File Edit Run Compile Project Options Debug

Line 11 Col 12 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
void main()
{
char s[20],ch; int i;
clrscr();
while(1)
{
randomize();
for(i=0;i<8;i++)
{
s[i]=random(10)+48;
}s[i]='\0';
printf("O T P = %s\n",s);flushall();
printf("Resend O T P[y/n]");scanf("%c",&ch);
if(ch=='n'||ch=='N')break;
}
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:26 AM >
06-Dec-24

```
O T P = 48617758
Resend O T P[y/n]y
O T P = 08624487
Resend O T P[y/n]y
O T P = 91444745
Resend O T P[y/n]n
```

A screenshot of a Windows desktop environment. A black command-line window titled 'TC' is open in the center. It contains several lines of text starting with 'O T P =' followed by numerical values and 'Resend' prompts. The taskbar at the bottom features a yellow pinned icon bar with icons for File Explorer, Task View, Task Manager, Edge browser, Google Chrome, File Explorer again, Paint 3D, File Explorer once more, and File Explorer again. To the right of the pinned icons is a standard taskbar with icons for keyboard, mouse, battery, signal strength, volume, and a date/time indicator showing '9:27 AM 06-Dec-24'.

Pass word creation:

TC

File Edit Run Compile Project Options Debug

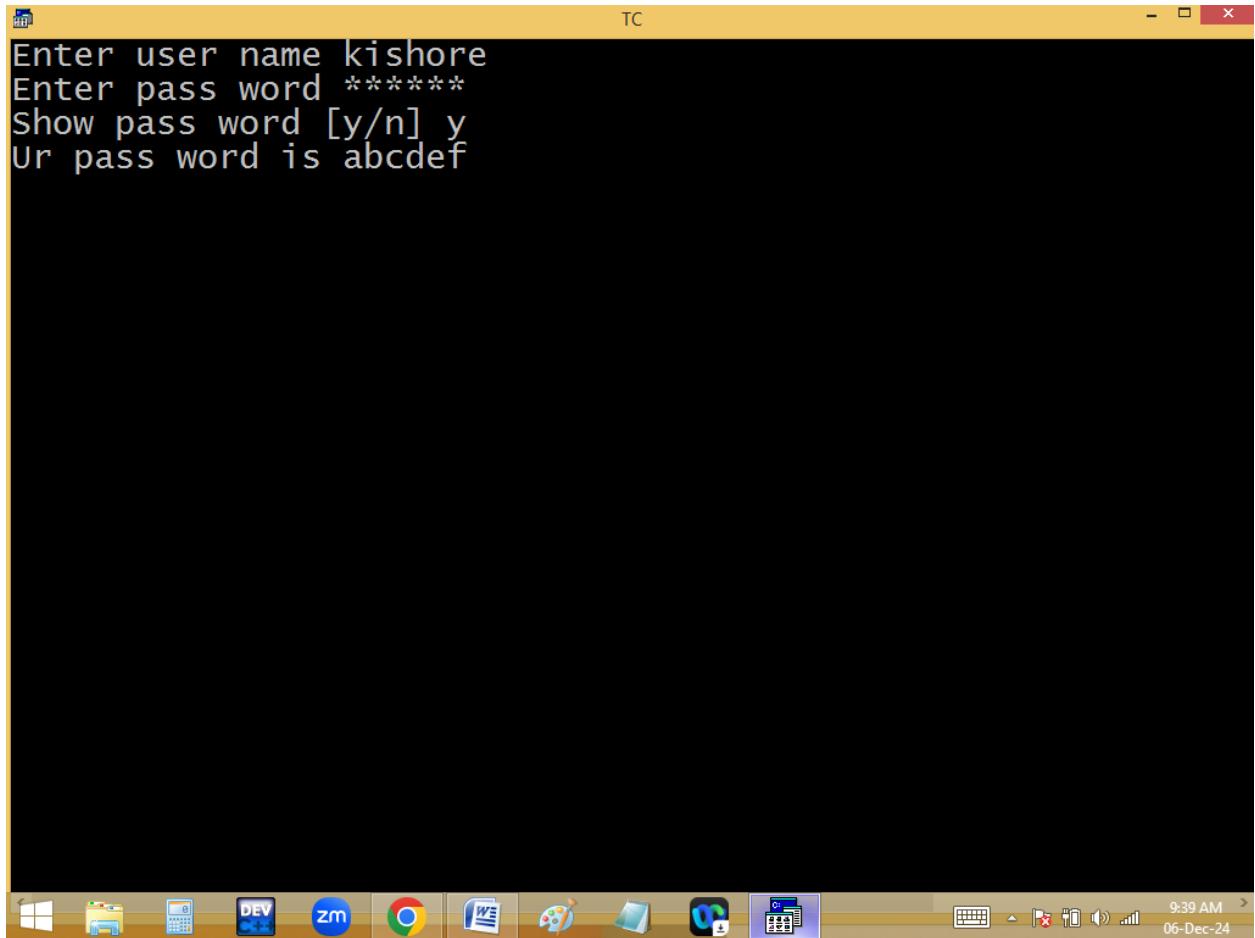
Line 14 Col 15 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char user[20],pass[20],ch; int i=0;
clrscr();
printf("Enter user name "); scanf("%s",user);
printf("Enter pass word ");
while((ch=getch())!=13)
{
printf("*");
pass[i]=ch;
i++;
}pass[i]='\0';
printf("\nShow pass word [y/n] "); fflush();
scanf("%c",&ch);
if(ch=='y'||ch=='Y')
printf("Ur pass word is %s",pass);
else puts("Pass word protected");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:39 AM >
06-Dec-24



```
TC
Enter user name Krish
Enter pass word *****
Show pass word [y/n] n
Pass word protected
```



9:40 AM >
06-Dec-24

Finding palindrome string or not using single string?

liril, madam, malayalam, ..

TC

File Edit Run Compile Project Options Debug

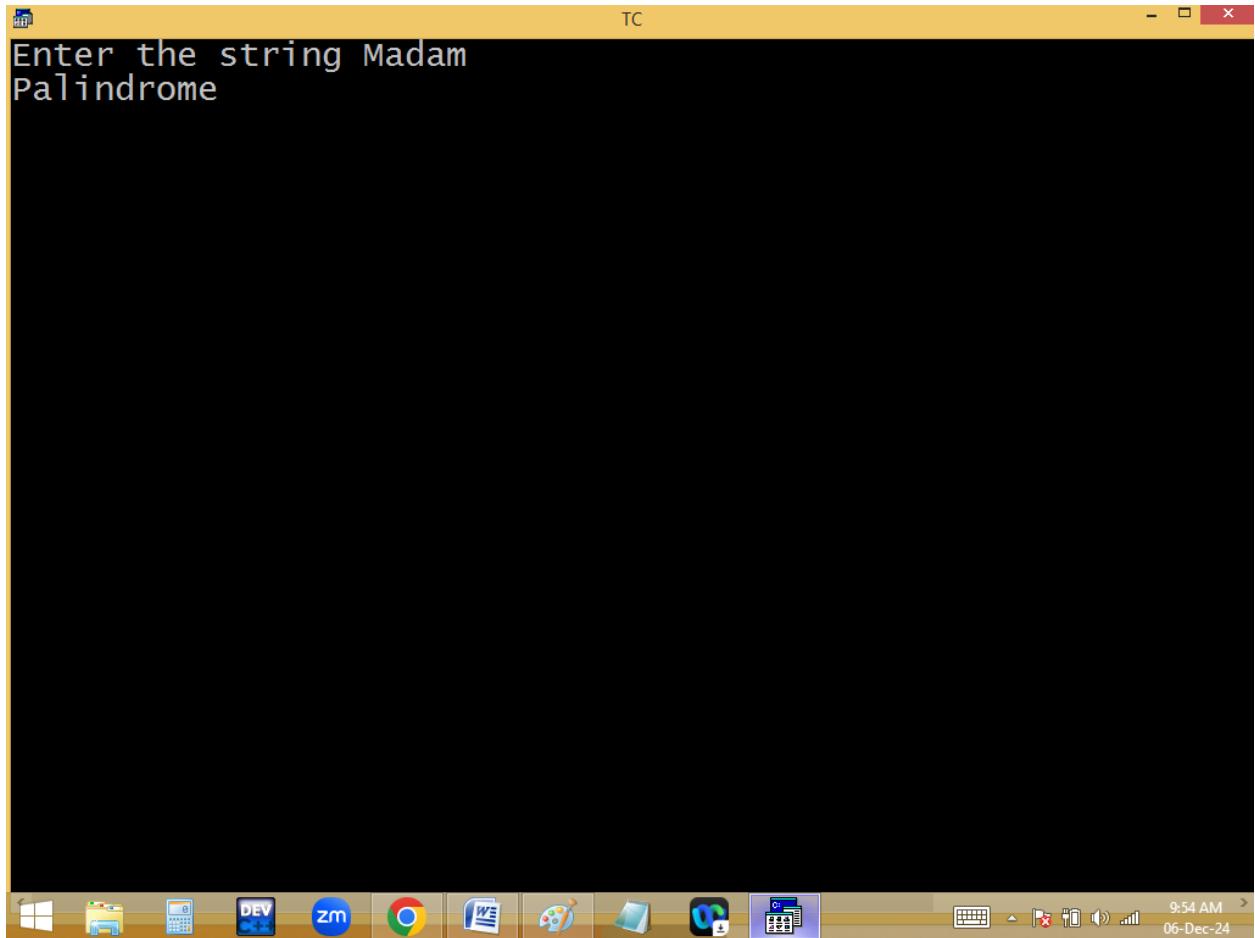
Line 3 Col 18 Insert Indent Tab Fill Unindent * E

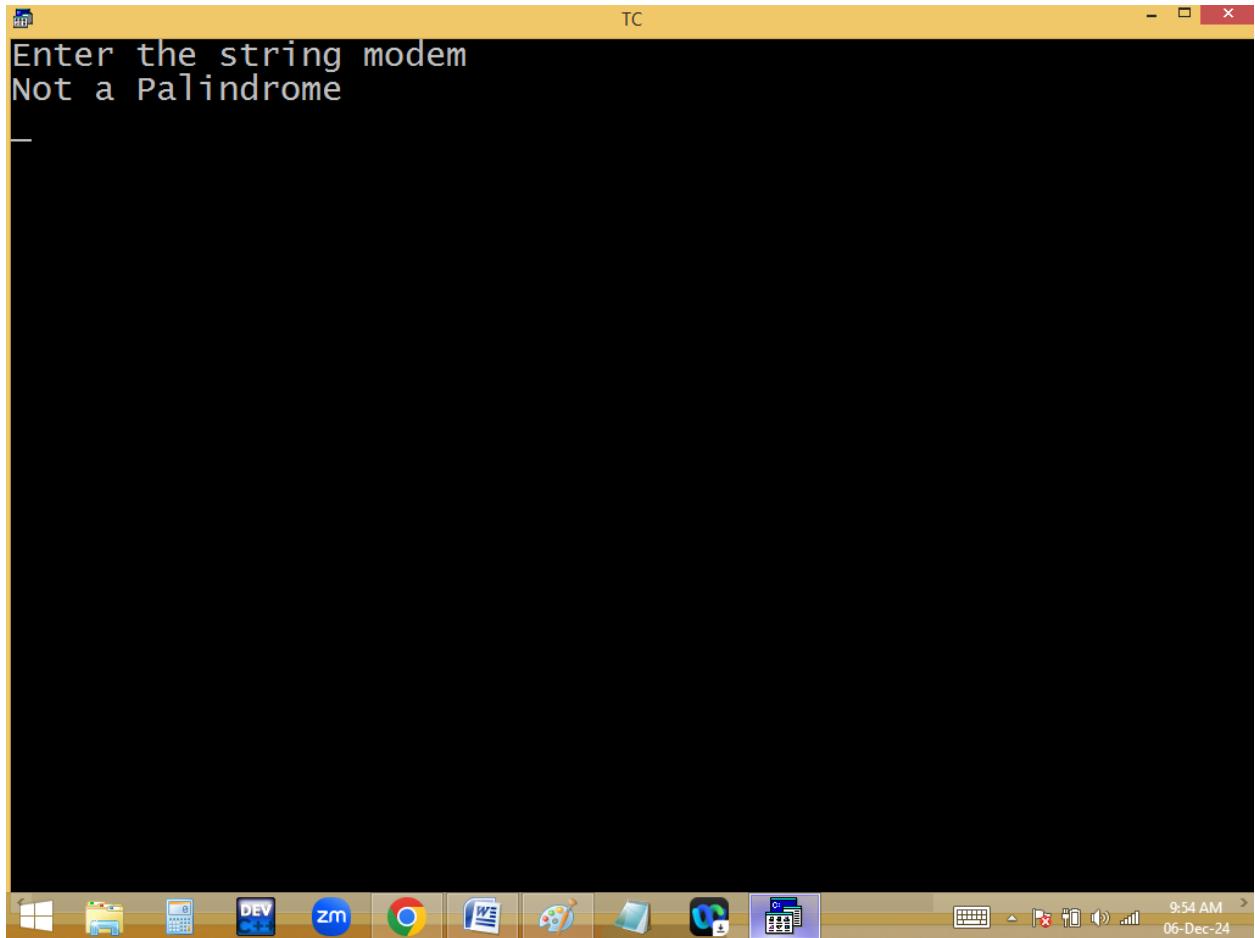
```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
    char s[100]; int i,j;
    clrscr();
    printf("Enter the string "); scanf("%s",s);
    for(i=0;s[i]!='\0';i++); /* strlen */
    for( j=0; j<i/2;j++ )
    {
        if(tolower(s[j]) != tolower(s[i-j-1]) ) 
        {puts("Not a Palindrome");getch();return;}
    }
    puts("Palindrome");
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:54 AM >
06-Dec-24





```
TC
Enter the string 010
Palindrome
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the text 'Enter the string 010' followed by 'Palindrome'. Below the terminal is a standard Windows taskbar. On the taskbar, from left to right, are icons for File Explorer, Task View, Start, Edge browser, Microsoft Word, Microsoft Paint, Microsoft Word, Microsoft Edge, and File Explorer. To the right of the taskbar, there are several system status icons, including battery level, signal strength, and volume, along with the system date and time: '9:55 AM 06-Dec-24'.

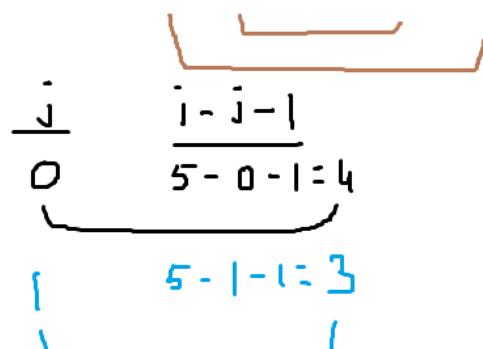
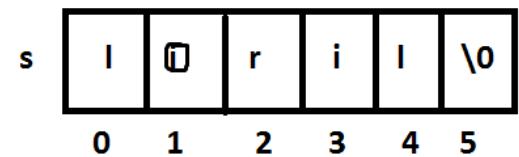
TC

```
Enter the string *1*
Palindrome
```

9:55 AM >
06-Dec-24

```
for( i=0; s[i]!='\0'; i++ ) ; len=5<=i

for( j=0;j<i/2;j++)
{
    if( a[j] != a[i-j-1] ) {puts("Not");return;}
}
puts("Palindrome");
```



Using 2 strings:

TC

File Edit Run Compile Project Options Debug

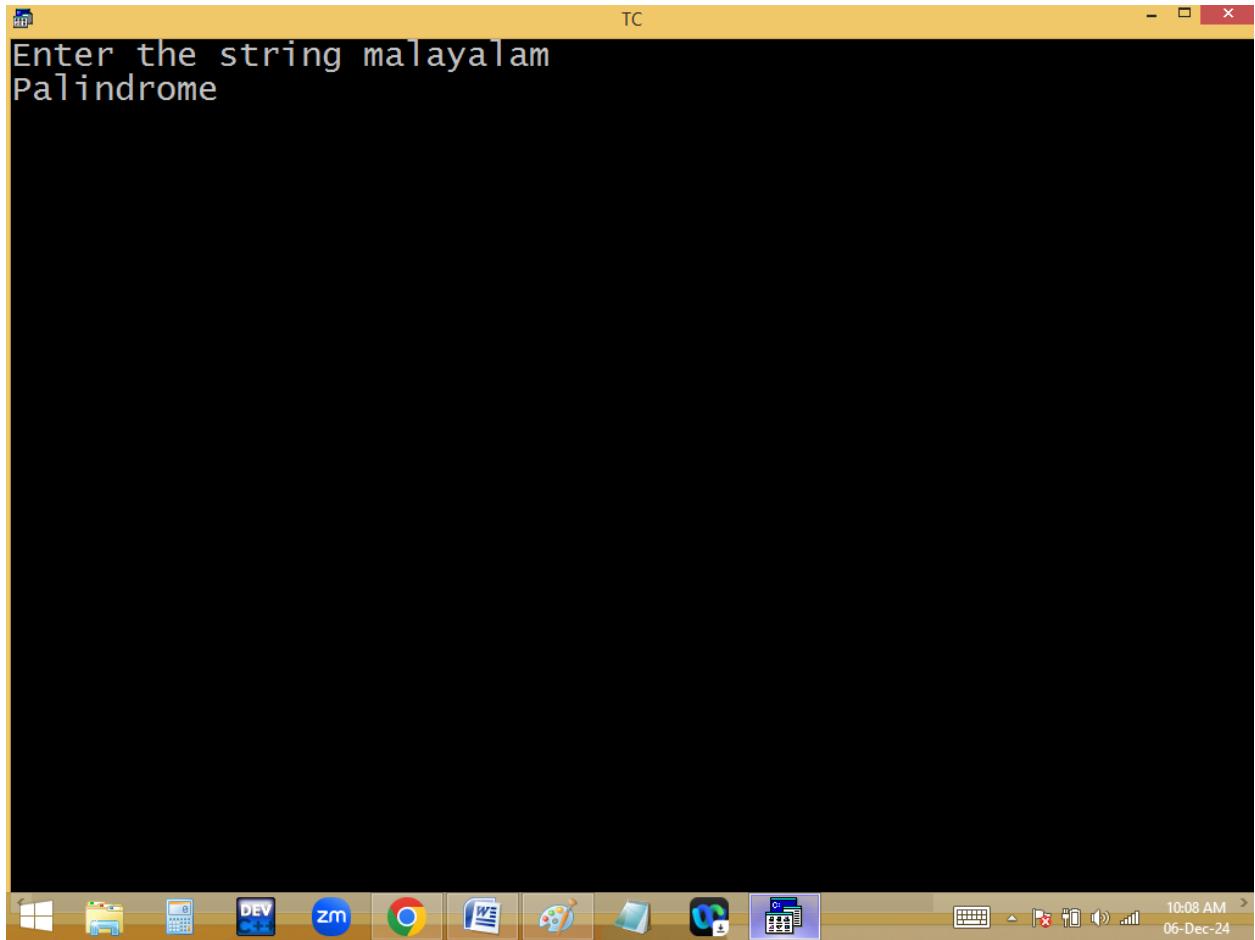
Line 8 Col 43 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
void main()
{
char s1[100],s2[100]; int i,j;
clrscr();
printf("Enter the string "); scanf("%s",s1);
for(i=0;s1[i]!='\0';i++); /* strlen */
for( s2[i--]='\0',j=0; i>=0;i--,j++ )
{
s2[j]=s1[i];/*str rev+copy*/
}
for(i=0;s1[i]!='\0';i++)
{
if(tolower(s1[i]) != tolower(s2[i]) )
{puts("Not a Palindrome");getch();return;}
}
puts("Palindrome");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:08 AM >
06-Dec-24



```
TC
Enter the string ammu
Not a Palindrome
```



The screenshot shows a Windows desktop environment. A terminal window titled 'TC' is open, displaying the output of a program. The terminal window has a yellow header bar with the title 'TC'. The main area of the terminal shows the text 'Enter the string ammu' followed by 'Not a Palindrome'. Below the terminal window is a standard Windows taskbar. On the taskbar, there are several pinned icons: Start, File Explorer, Task View, Edge browser, File Explorer, Google Chrome, File Explorer, Paint 3D, File Explorer, and File Explorer. To the right of the taskbar, the system tray displays the date and time as '10:08 AM 06-Dec-24'.

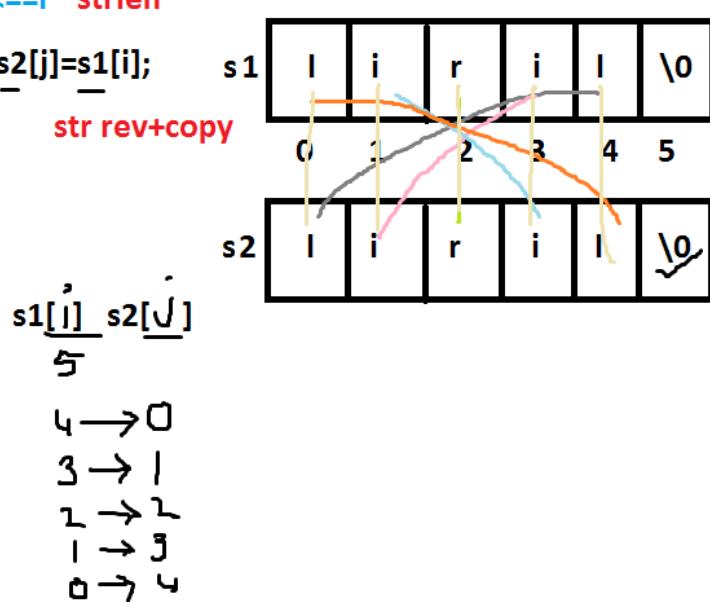
TC

Enter the string Dad
Palindrome

```

for( i=0; s1[ i]!='\0';i++); len=5<=i  strlen
for( s2[i--]='\0', j=0;i>=0;i--,j++)s2[j]=s1[i];
      5
      str rev+copy
for( i=0; s1[i]!='\0';i++)
{
    strcmp
    if(s1[i]!=s2[i])p(Not);return;
}
p(palindrome);

```



String concatenation:

Enter first name: kishore

Enter last name: naidu

Ur email id is **kishorenaidu@gmail.com**

TC

File Edit Run Compile Project Options Debug

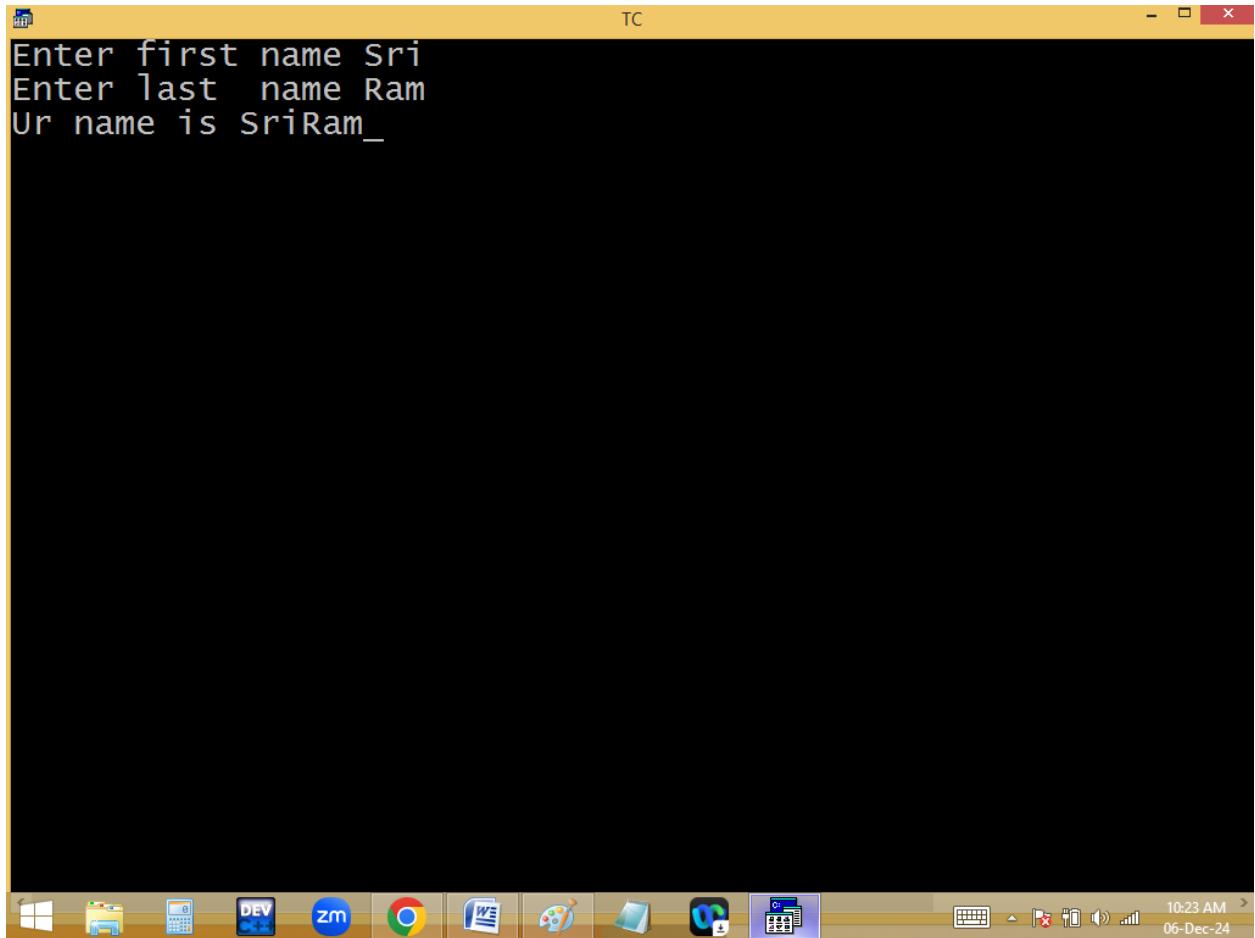
Line 10 Col 23 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    char s1[100],s2[100],s3[200]; int i,j;
    clrscr();
    printf("Enter first name "); gets(s1);
    printf("Enter last name "); gets(s2);
    for(i=0;s1[i]!='\0';i++)s3[i]=s1[i]; /* strcpy */
    for( j=0; s2[j]!='\0';j++ )s3[i+j]=s2[j]; /* strcat */
    s3[i+j]='\0';
    printf("Ur name is %s",s3);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:22 AM >
06-Dec-24



The screenshot shows a Windows desktop environment. At the top, there's a taskbar with various pinned icons including File Explorer, Edge, Task View, and others. A command-line window titled "TC" is open, showing the following text:
Enter first name Sachin
Enter last name Tendulkar
Ur name is SachinTendulkar_
The desktop background is black, and the overall interface is typical of a Windows 10 or 11 desktop.

With space:

TC

File Edit Run Compile Project Options Debug

Line 10 Col 5 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s1[100],s2[100],s3[200]; int i,j;
clrscr();
printf("Enter first name "); gets(s1);
printf("Enter last name "); gets(s2);
for(i=0;s1[i]!='\0';i++)s3[i]=s1[i]; /* strcpy */
for(s3[i++]=' ',j=0;s2[j]!='\0';j++)s3[i+j]=s2[j]; /* strcat */
s3[i+j]='\0';
printf("Ur name is %s",s3);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:25 AM >
06-Dec-24

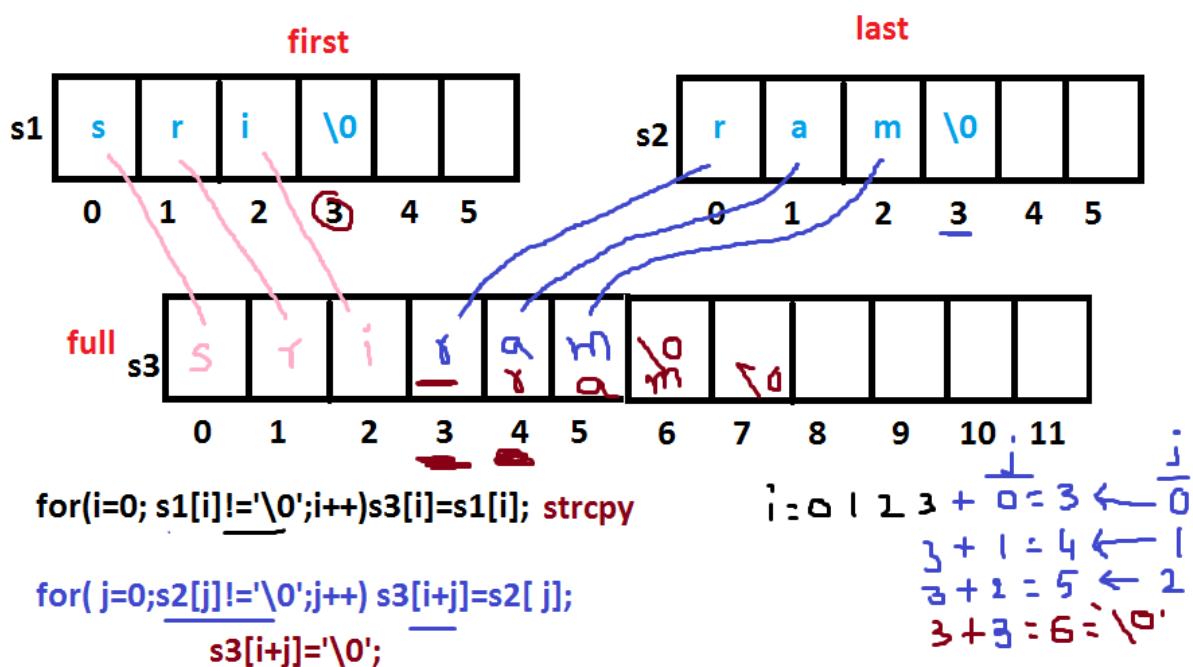
TC

```

Enter first name Sharukh
Enter last name Khan
Ur name is Sharukh Khan

```

10:25 AM >
06-Dec-24



strcpy(): It copies the source string into destination string.

Strncpy():it copies specified no of char into destination string.

TC

File Edit Run Compile Project Options Debug

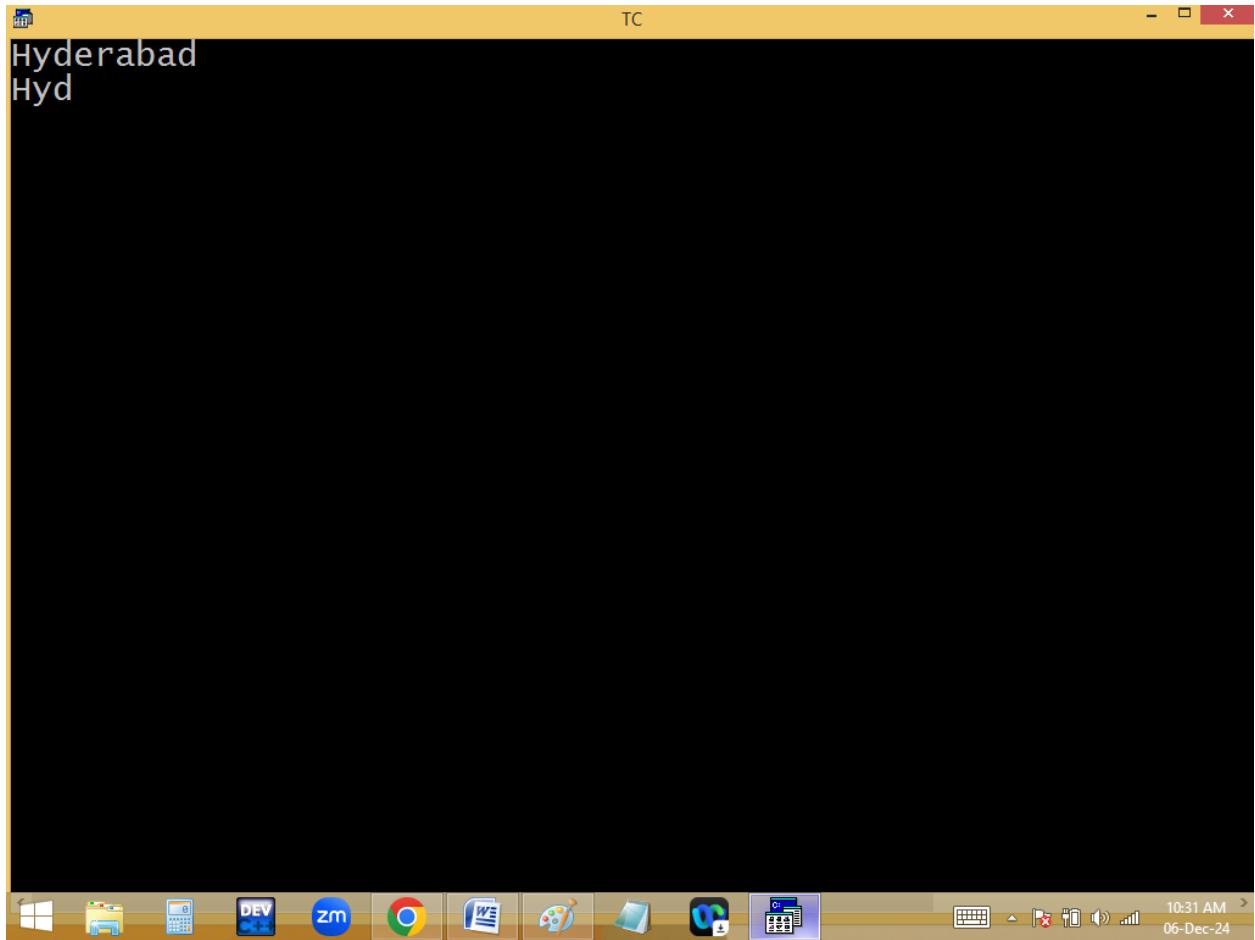
Line 10 Col 12 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
    char s1[100], s2[100], s3[]="Hyderabad";
    clrscr();
    strcpy(s1,s3);
    strncpy(s2,s3,3);
    s2[3]='\0';
    puts(s1);
    puts(s2);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:31 AM >
06-Dec-24



Strcat(): It adds string2 with string1

Strncat(): It adds specified no of char's to string1.

TC

File Edit Run Compile Project Options Debug

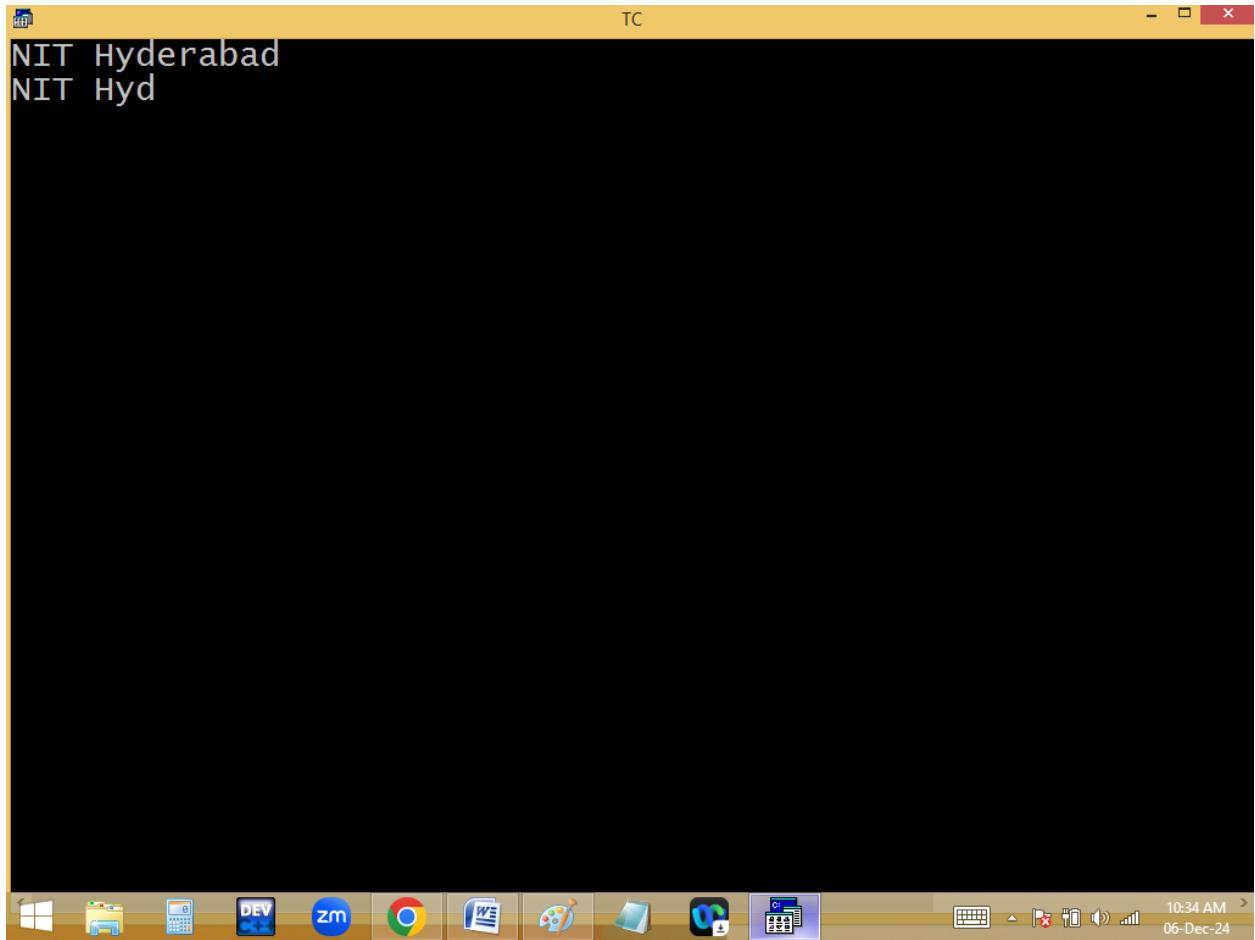
Line 10 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
    char s1[100] = "NIT ", s2[100] = "NIT ", s3[] = "Hyderabad";
    clrscr();
    strncat(s1, s3);
    strncat(s2, s3, 3);
    puts(s1);
    puts(s2);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:34 AM >
06-Dec-24



strcmp(): It compare two strings and return the ascii difference. When first is difference is found, the remaining string is not checked.

TC

File Edit Run Compile Project Options Debug

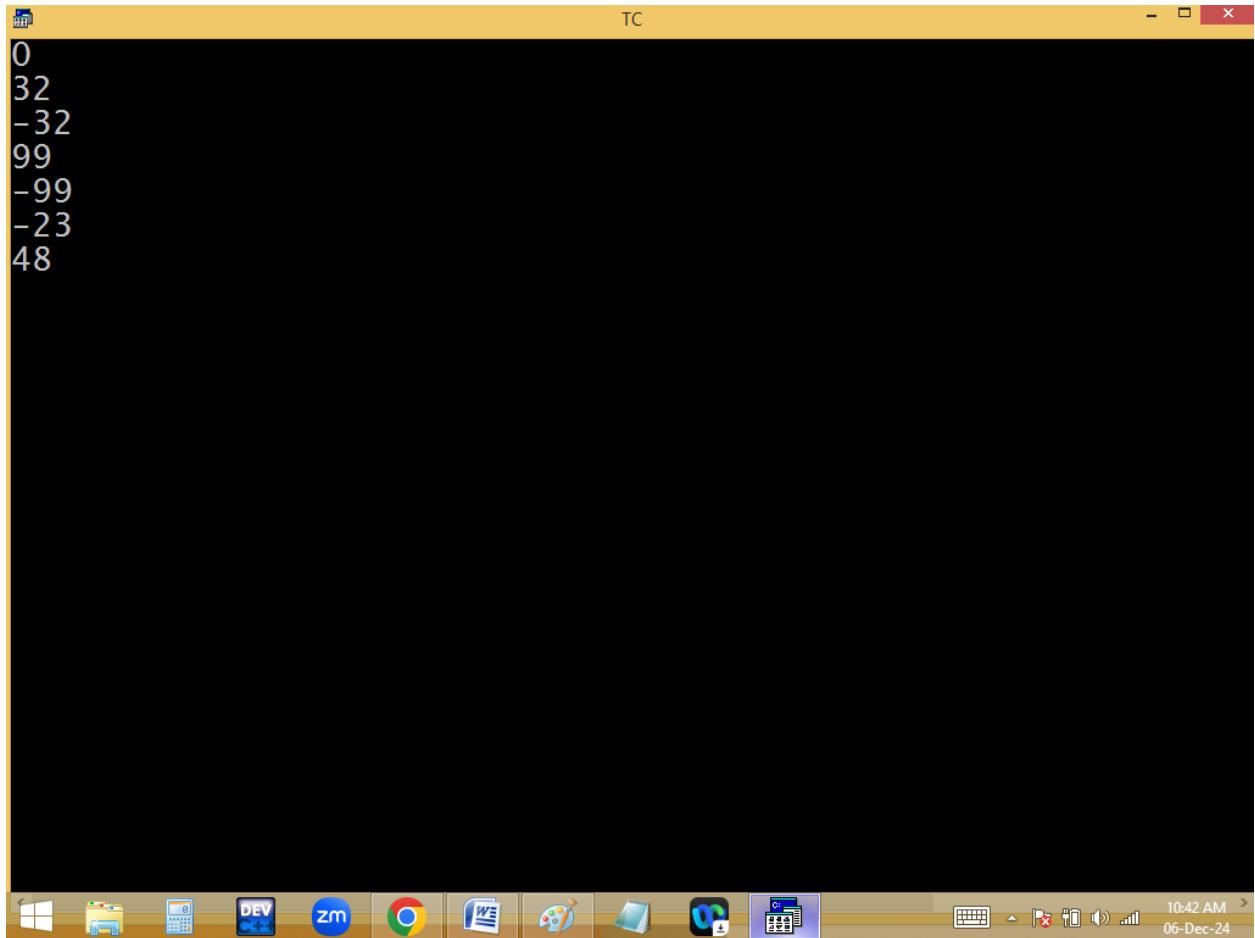
Line 10 Col 32 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
clrscr();
printf("%d\n",strcmp("ab","ab"));
printf("%d\n",strcmp("ab","AB"));
printf("%d\n",strcmp("AB","ab"));
printf("%d\n",strcmp("abc","ab"));
printf("%d\n",strcmp("ab","abc"));
printf("%d\n",strcmp("ab","xyz"));
printf("%d\n",strcmp("ab","1234"));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:42 AM >
06-Dec-24



```
0
32
-32
99
-99
-23
48
```

strcmp():

in **strcmp()**, I means ignore case i.e. lower and upper are same. When matching char not found or different data type found in 2nd string, the first string char taken in upper case.

TC

File Edit Run Compile Project Options Debug

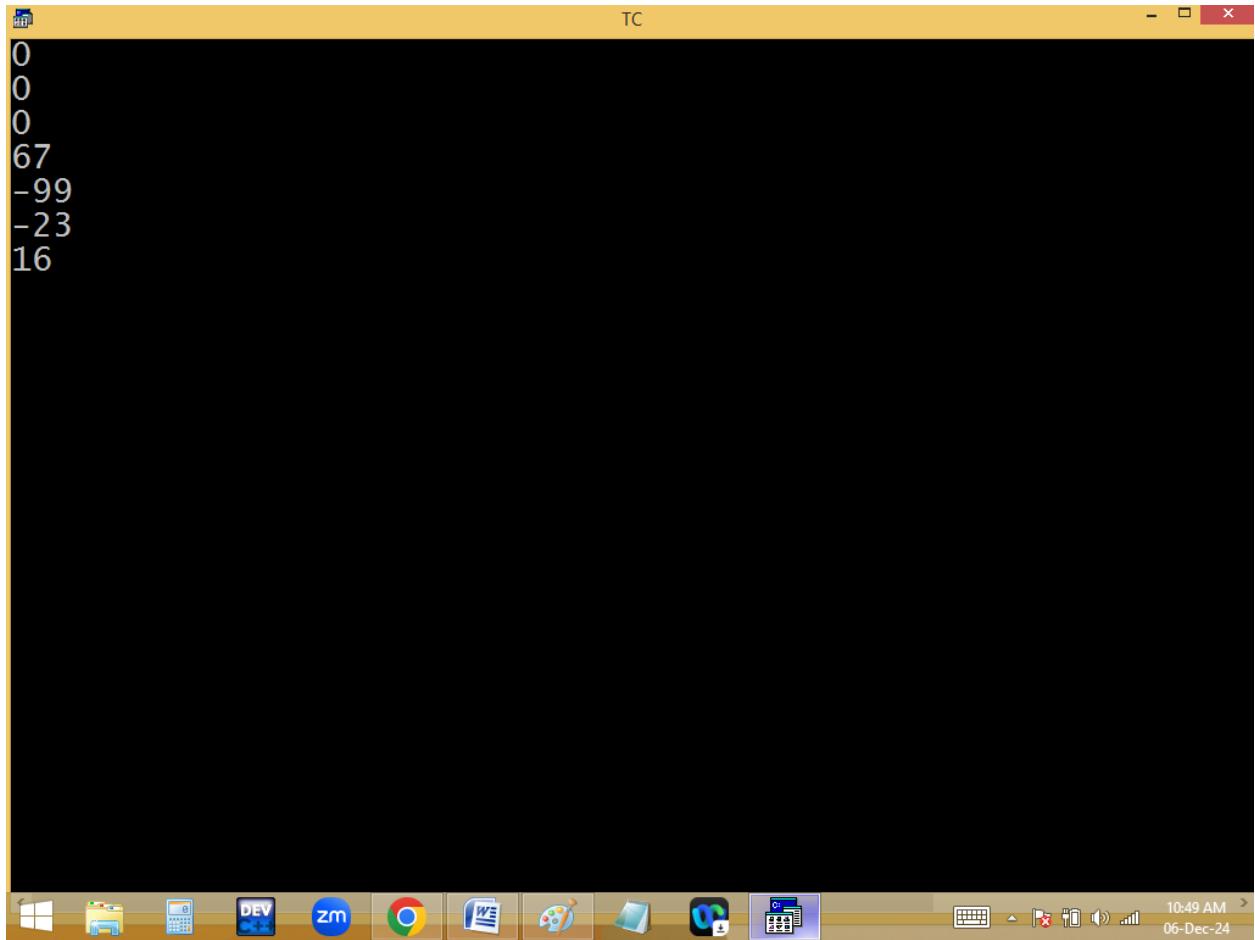
Line 13 Col 19 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
clrscr();
printf("%d\n",strcmp("ab","ab"));
printf("%d\n",strcmp("ab","AB"));
printf("%d\n",strcmp("AB","ab"));
printf("%d\n",strcmp("abc","ab"));
printf("%d\n",strcmp("ab","abc"));
printf("%d\n",strcmp("ab","xyz"));
printf("%d\n",strcmp("ab","1234"));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:49 AM >
06-Dec-24



strstr(): It searches for the sub string and if found, it return the sub string address. If sub string not found, it return 0 / (null)

strstr(main string, sub string);

TC

File Edit Run Compile Project Options Debug

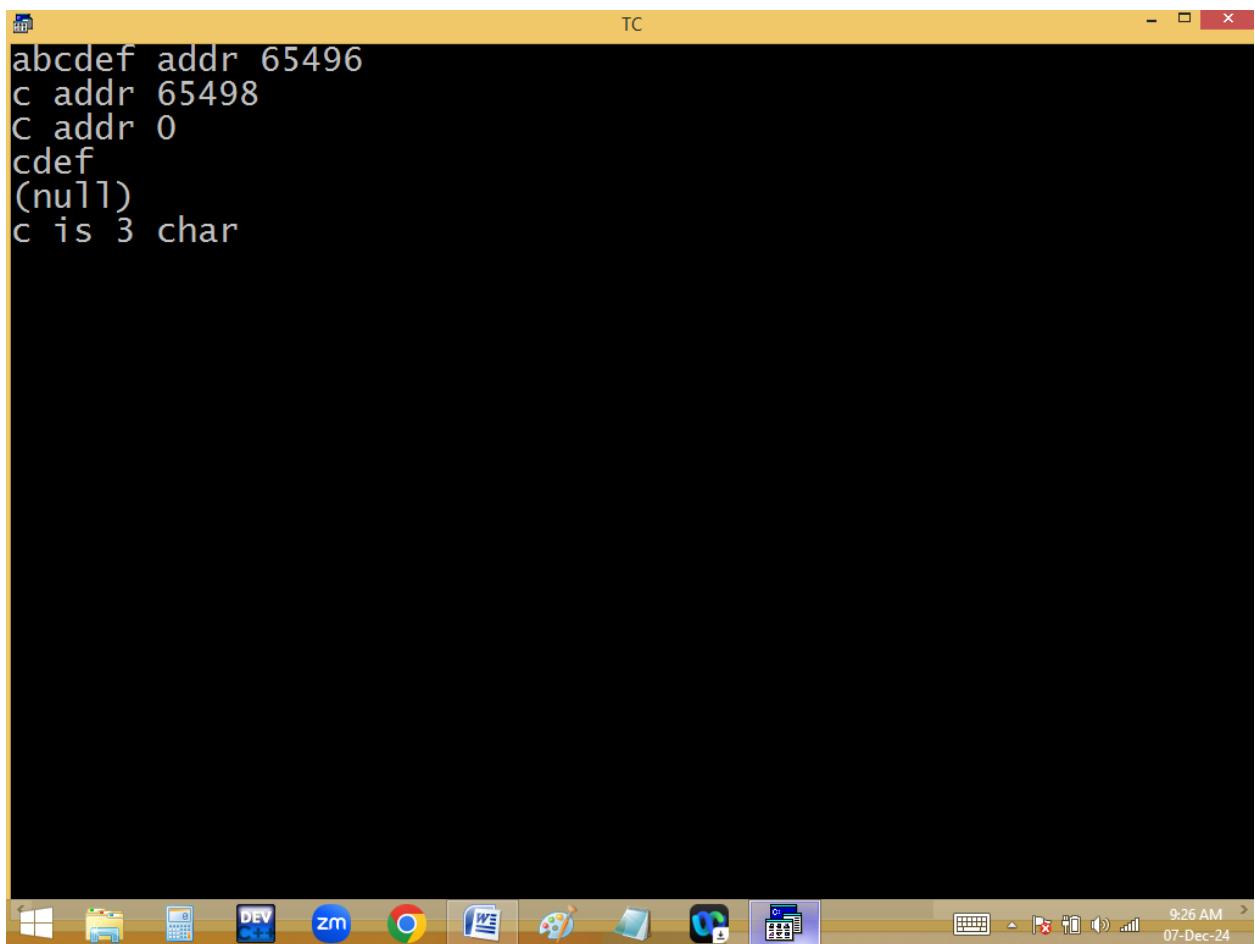
Line 13 Col 40 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char s[]="abcdef";
clrscr();
printf("%s addr %u\n",s,s);
printf("c addr %u\n",strstr(s,"c"));
printf("C addr %u\n",strstr(s,"C"));
printf("%s\n",strstr(s,"c"));
printf("%s\n",strstr(s,"C"));
printf("c is %d char",strstr(s,"c")-s+1);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:26 AM >
07-Dec-24



abcdef addr 65496
c addr 65498
C addr 0
cdef
(null)
c is 3 char

Browser working style:

TC

File Edit Run Compile Project Options Debug

Line 14 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
    char s[7][20],sub[20]; int i;
    clrscr();
    puts("Enter 7 names ");for(i=0;i<7;i++)gets(s[i]);
    printf("Enter the search string ");gets(sub);
    puts("NAMES");
    puts("*****");
    for(i=0;i<7;i++)
        if(strstr(s[i],sub)!=0)puts(s[i]);
    getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:37 AM >
07-Dec-24

```
TC
Enter 7 names
vijay krishna
anushka sharma
jhanvi kapoor
sharukh khan
salman khan
allu arjun
rashmika
Enter the search string sh
NAMES
*****
vijay krishna
anushka sharma
sharukh khan
rashmika
-
```

Finding palindrome using library functions?

TC

File Edit Run Compile Project Options Debug

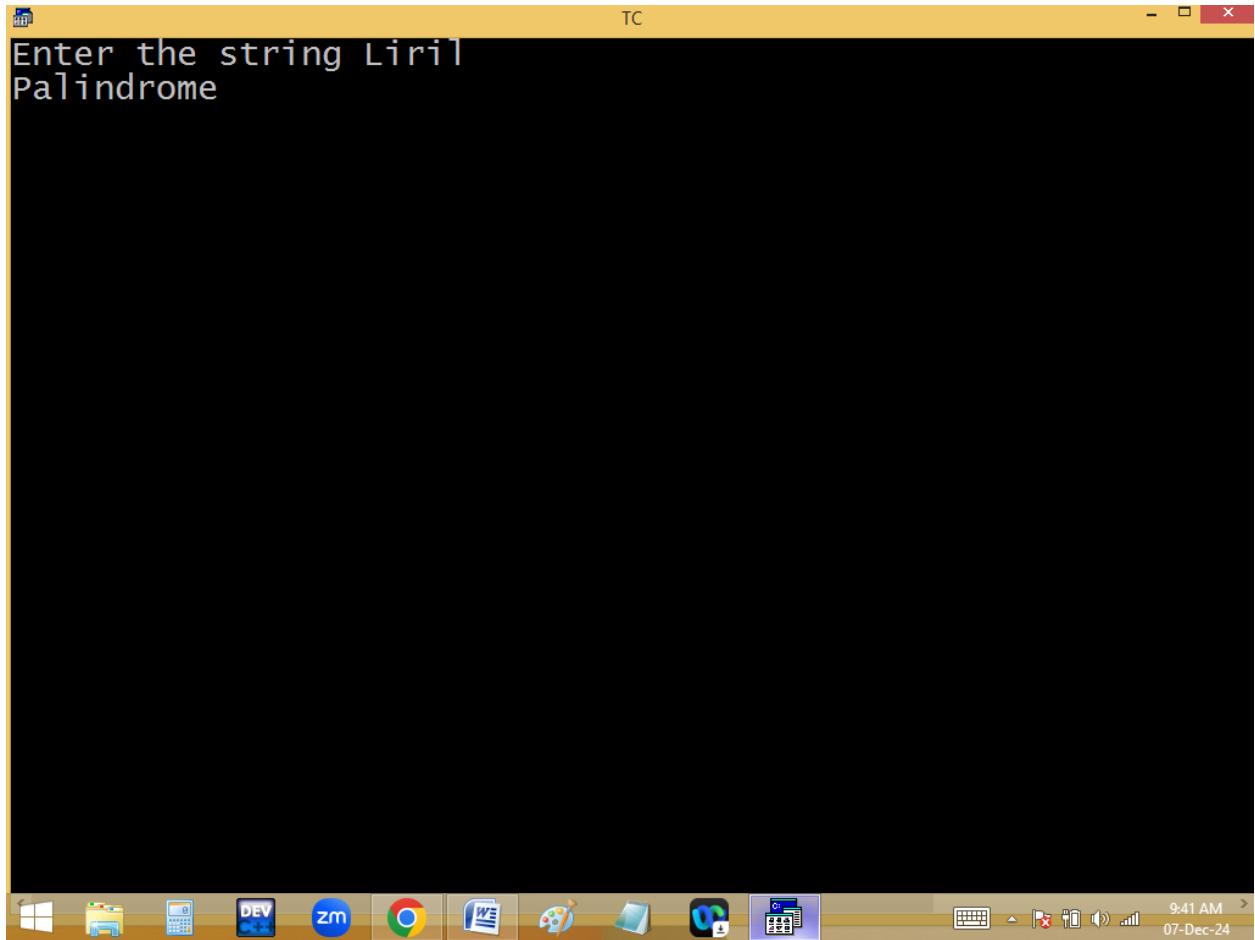
Line 11 Col 10 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char s1[50],s2[50];
clrscr();
printf("Enter the string "); gets(s1);
strcpy(s2,s1);
strrev(s2);
puts(strcmp(s1,s2)==0?"Palindrome":"Not a Palindrome");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:41 AM >
07-Dec-24



```
Enter the string toril
Not a Palindrome
```

Sorting of strings:

s[0]	rishi chintu chinna
s[1]	chintu rishi pinky chintu
s[2]	pinky rishi pinky
s[3]	chinna chintu pinky rishi

TC

File Edit Run Compile Project Options Debug

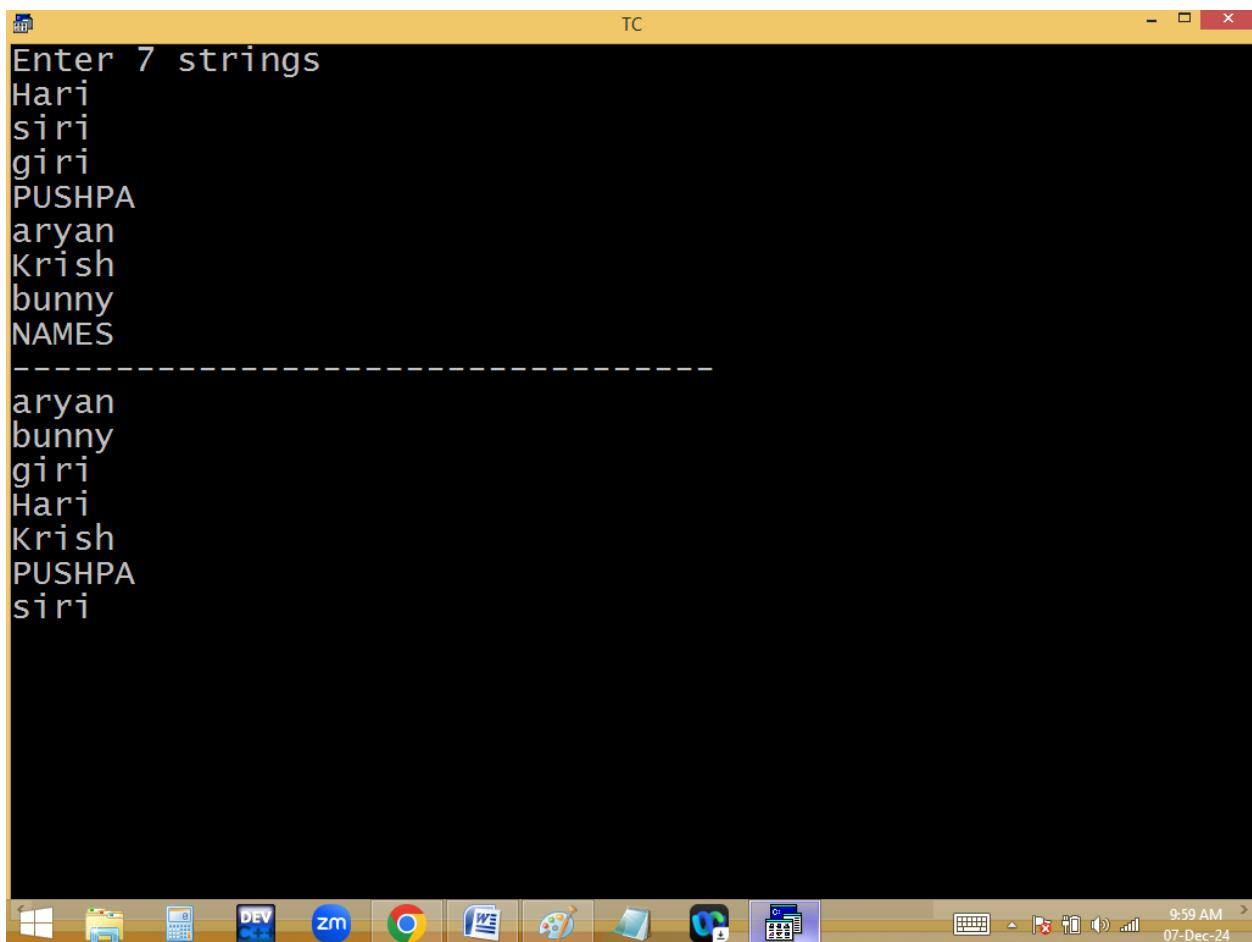
Line 13 Col 8 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char s[7][50],t[50]; int i,j;
clrscr();
printf("Enter 7 strings\n");for(i=0;i<7;i++)gets(s[i]);
for(i=0;i<=5;i++)
{
for(j=i+1;j<=6;j++)
{
if(strcmp(s[i],s[j])>0)
{strcpy(t,s[i]);strcpy(s[i],s[j]);strcpy(s[j],t);}
}
}
puts("NAMES");
puts("-----");
for(i=0;i<7;i++)puts(s[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:59 AM >
07-Dec-24



```
Enter 7 strings
Hari
siri
giri
PUSHPA
aryan
Krish
bunny
NAMES
-----
aryan
bunny
giri
Hari
Krish
PUSHPA
siri
```

POINTERS

Pointer is a variable which stores the address of another variable of same type.

Pointer is a variable which stores the address of memory [byte] at runtime [**dynamic**]

It is a derived data type.

`int * p; → int pointer variable`

Advantages:

1. DMA – runtime mem alloc
2. Prevents wastage of memory
3. Performance is high
4. System software development
5. Data structures
6. Call by reference/address – sharing of local var from diff functions
7. Array/strings

8. File handling

POINTERS

Pointer is a variable, which holds the address of another variable of same type.

Pointer is a memory location, which holds the address of another memory location.

Pointer is a derived data type.

Advantages:

1. Dynamic memory allocation.
2. Program performance is increased due to preventing memory wastage.
3. They are very much used in System programming.
4. They are very much used in dynamic linked list & Stacks [**data structures**].
5. **It allows to access local variable outside the function i.e. data sharing between functions.**
[**call by address/Reference**].
6. **To handle strings, arrays etc in functions we need pointers.**

7. To handle **data files** we are using pointers.
8. They directly works on variable address. Due to this search time is reduced and execution speed is increased.

Dis-advantage:

They are not secured.

Syntax:

datatype * variable;

- * indicates it is a pointer data type.
- * is called indirection operator.
- * is called dereferencing operator.
- *** is a re-direction operator.**
- * indicates value at that address.
- * indicates pointer value.

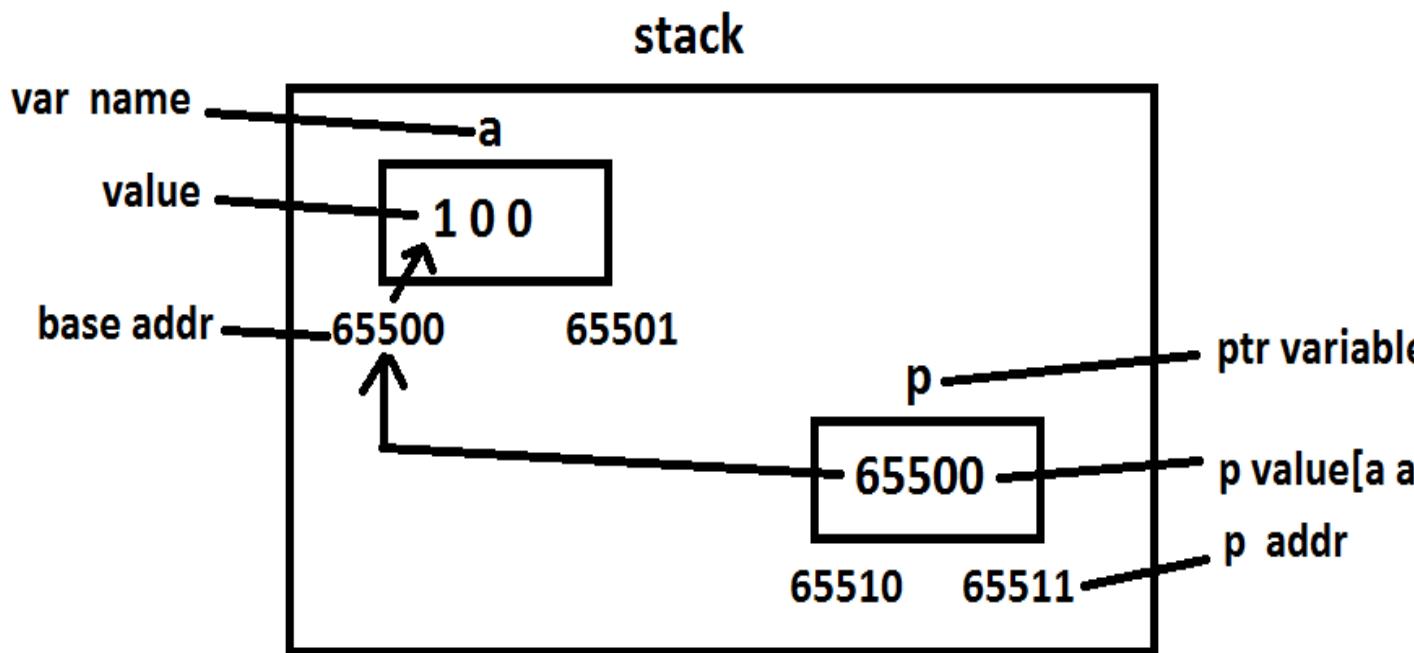
Eg:

```
int a=100, * p;
```

In the above example '**a**' is a general variable.

* indicates '**p**' is a pointer type variable and it is able to store the address of general variable '**a**' as follows.

p = &a;



In the above example, to pick the value of **a** through pointer variable **p**, we have to use the **printf()** as follows.

`printf("%d", *p);`

100

Here `*p` means **value of p** or **value at that addr.** i.e. **65500**. But **65500** is the **addr of ‘a’**.
The **value in a address is 100**.

Or

Here `p` means **65500**. `*p` means **value at 65500**.
i.e. **100**.

Due to this example any changes conducted in `*p` effects the value of **‘a’**. Hence `p` is called **pointer to a**.

Eg: `*p=200;`

Now **a** value becomes **200**.

Eg:

Finding a variable value and address using a pointer:

TC

File Edit Run Compile Project Options Debug
Line 16 Col 1 Indent Tab Fill Unindent * E

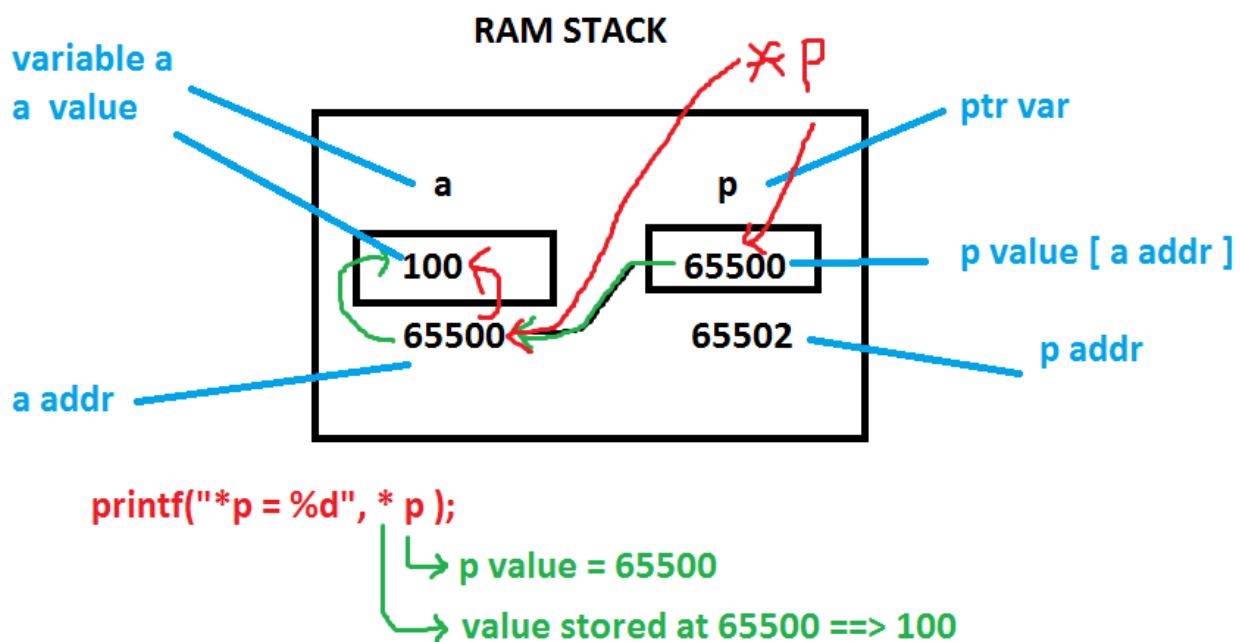
```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100, *p; /* ptr dec */
p = &a; /* init */
clrscr();
printf("a value %d\n",a);
printf("a addr %u\n",&a);
printf("p value %u\n",p);
printf("p addr %u\n",&p);
printf("*p = %d\n", *p);
*p=200;
printf("a=%d, *p=%d\n",a,*p);
a=300;
printf("a=%d, *p=%d\n",a,*p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:53 AM >
09-Dec-24

```
a value 100
a addr 65500
p value 65500
p addr 65502
*p = 100
a=200, *p=200
a=300, *p=300
```

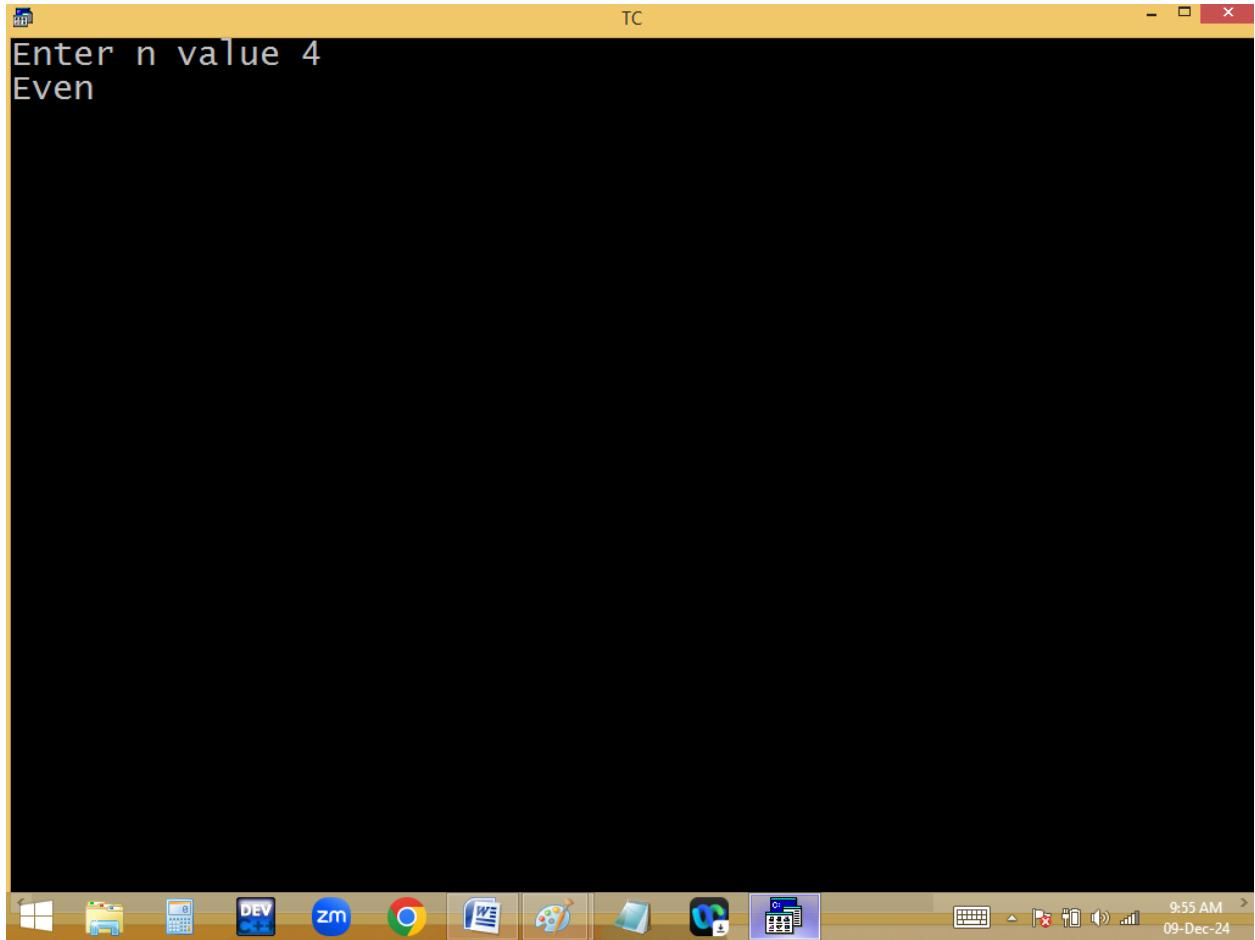


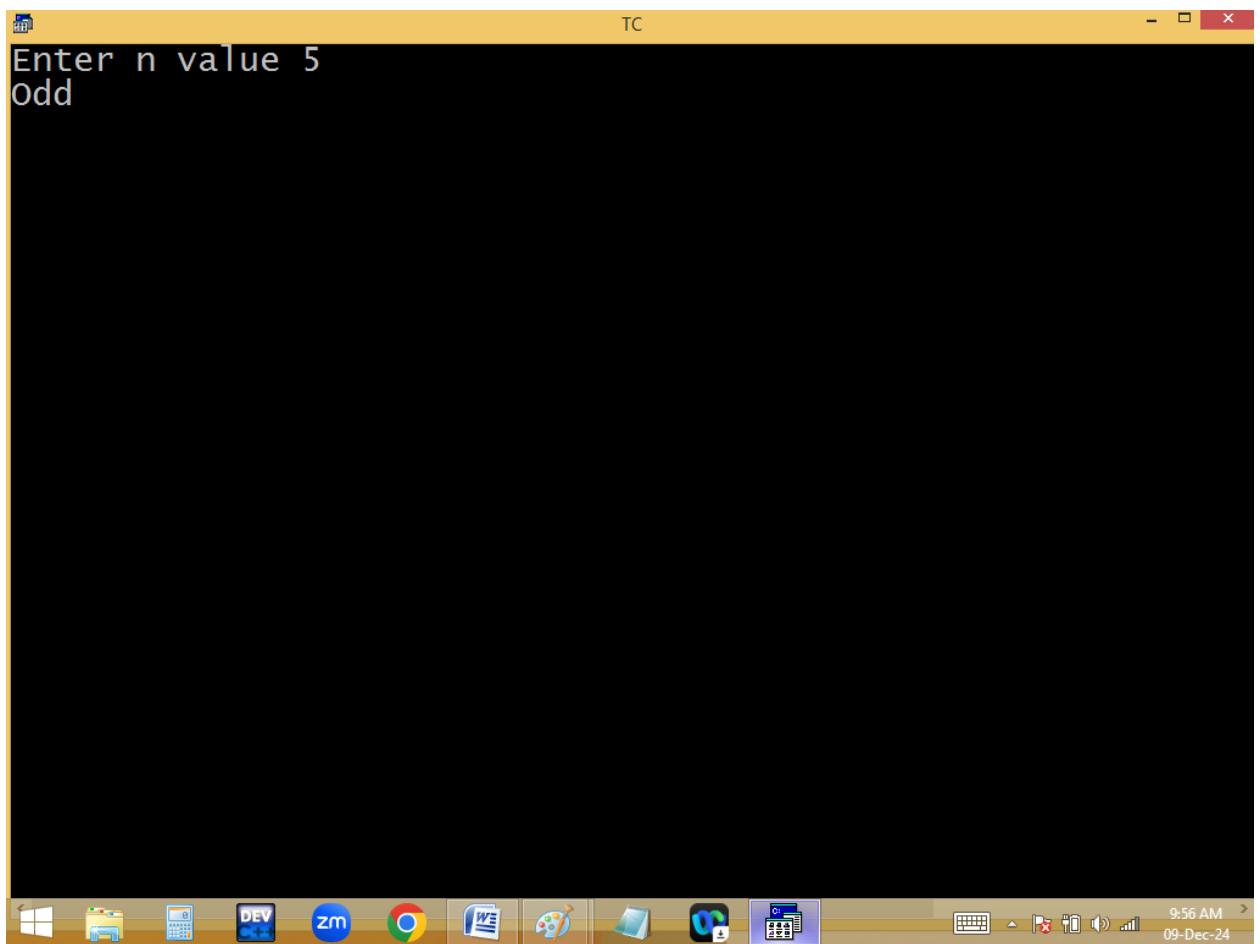
Finding even/odd using pointer:

The screenshot shows a Microsoft Windows desktop environment. In the center is a window titled "TC" (Turbo C++) with a dark blue background. The menu bar includes "File", "Edit", "Run", "Compile", "Project", "Options", and "Debug". Below the menu, it says "Line 9 Col 1 Insert Indent Tab Fill Unindent * E". The code in the editor is:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n, *p=&n; /* ptr dec & init */
    clrscr();
    printf("Enter n value ");scanf("%d",&n);
    puts(n%2?"Odd":"Even");
    getch();
}
```

At the bottom of the window, there are function keys: F1-Help, F5-Zoom, F6-Switch, F7-Trace, F8-Step, F9-Make, and F10. Below the window is the Windows taskbar with icons for various applications like File Explorer, Task View, and Google Chrome. The system tray shows the date and time as "09-Dec-24" and "9:55 AM".





TC

File Edit Run Compile Project Options Debug

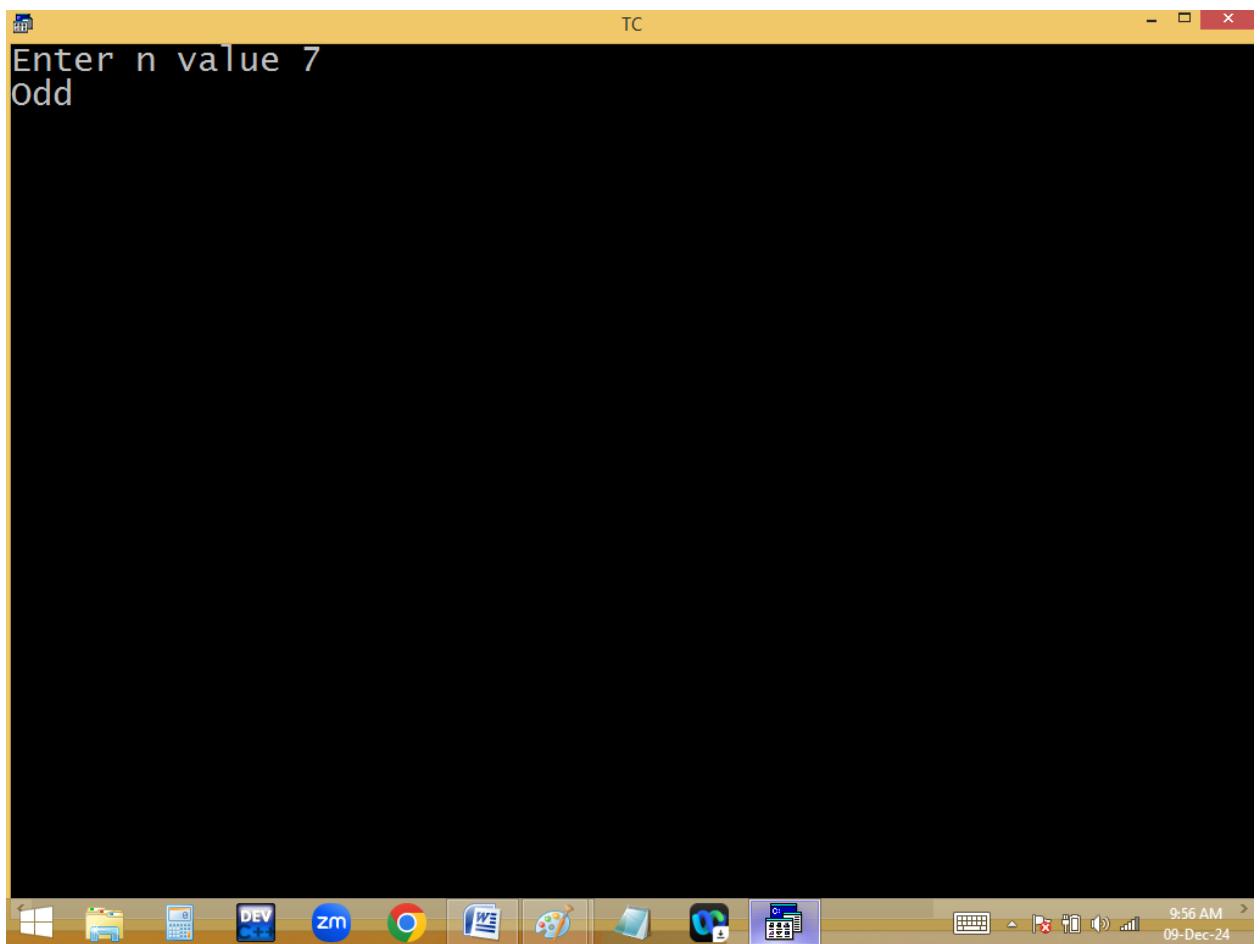
Line 8 Col 8 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, *p=&n; /* ptr dec & init */
clrscr();
printf("Enter n value ");scanf("%d",&n);
puts(*p%2?"Odd":"Even");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:56 AM >
09-Dec-24



```
Enter n value 8
Even
```

Finding +Ve/-Ve/0 using pointer:

TC

File Edit Run Compile Project Options Debug

Line 9 Col 27 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n, *p=&n; /* ptr dec & init */
clrscr();
printf("Enter n value ");scanf("%d",&n);
puts(n>0?"+Ve":n<0?-Ve:"Zero");
puts(*p>0?"+Ve":*p<0?-Ve:"Zero");
getch();
}
```

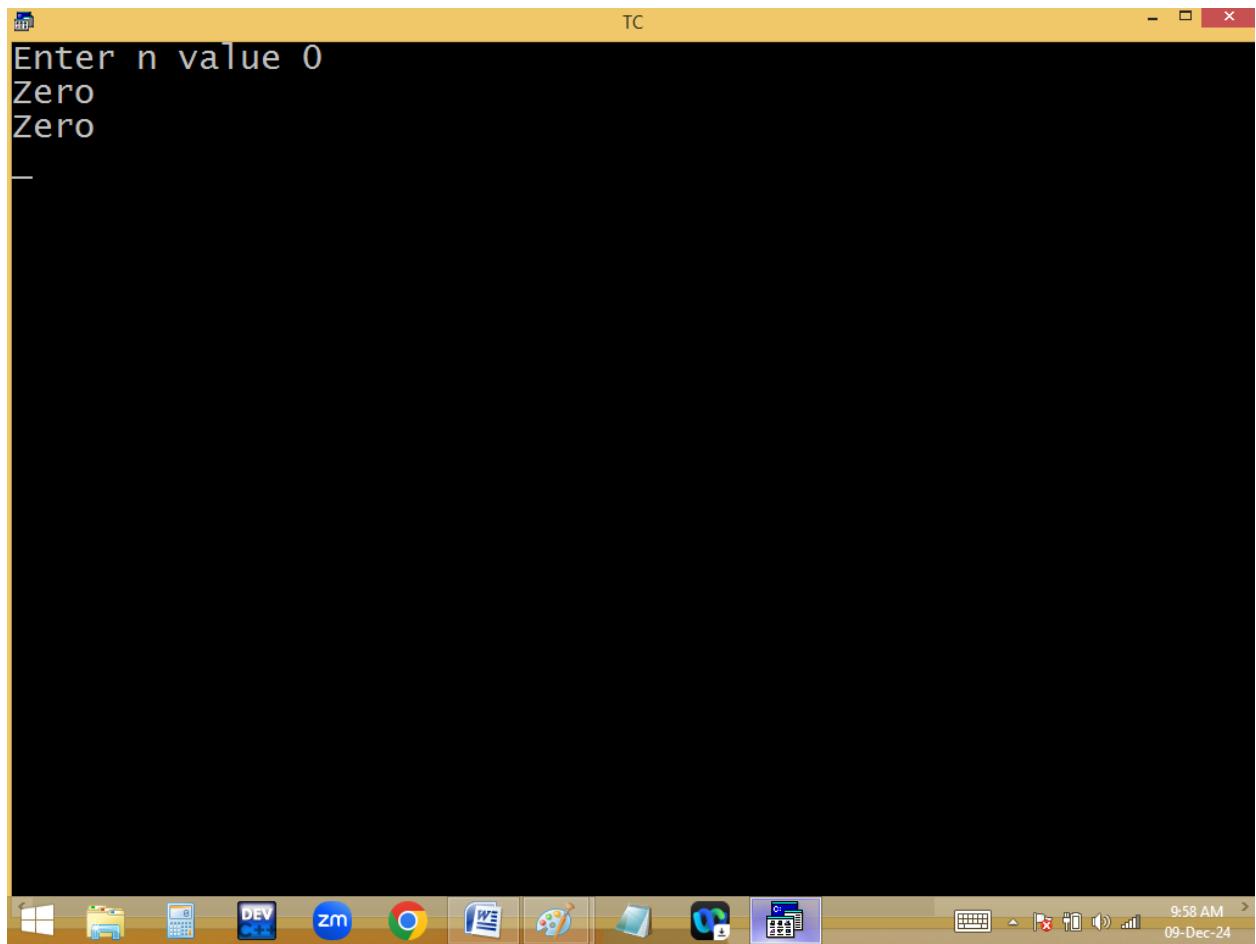
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:58 AM >
09-Dec-24

```
TC
Enter n value 7
+Ve
+Ve
```

```
Enter n value -9
-Ve
-Ve
```



```
Enter n value 0
Zero
Zero
```

Finding max in 2 no's using pointer:

TC

File Edit Run Compile Project Options Debug

Line 10 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,*p=&a, *q=&b; /* ptr dec & init */
clrscr();
printf("Enter a, b values ");scanf("%d%d",&a,&b);
puts(a>b?"a is big":b>a?"b is big":"Both are equal");
puts(*p>*q?"a is big":*q>*p?"b is big":"Both are equal");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



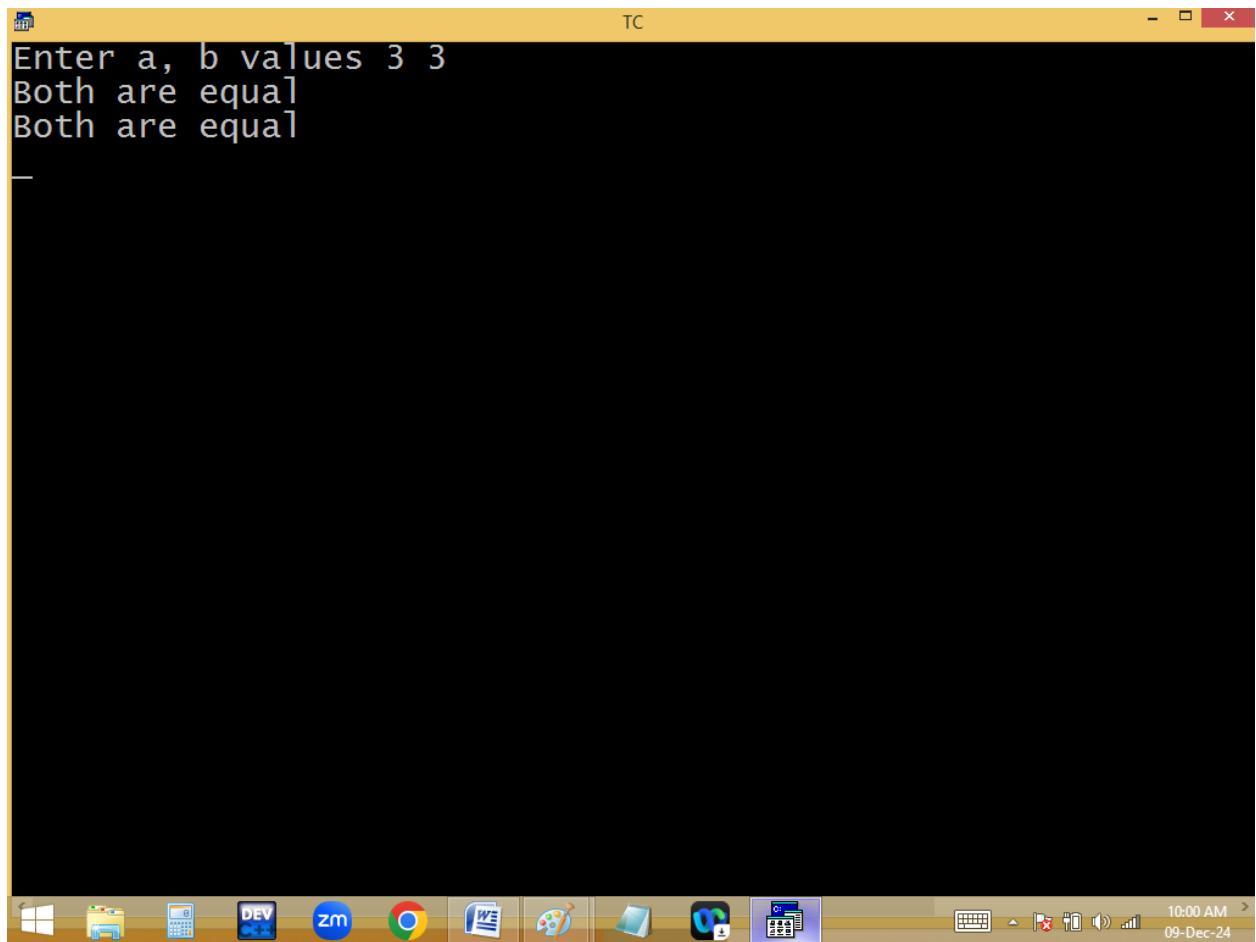
10:00 AM >
09-Dec-24

```
TC
Enter a, b values 1 2
b is big
b is big
```

The image shows a Windows desktop environment. A window titled "TC" is open, displaying the output of a program. The taskbar at the bottom contains several pinned icons, including File Explorer, Task View, Start, Edge, File Explorer, Google Chrome, Microsoft Word, Microsoft Paint, Microsoft Edge, File Explorer, and Task View again. On the right side of the taskbar, there are system status icons for battery level, signal strength, and volume, along with the current time (10:00 AM) and date (09-Dec-24).

```
TC
Enter a, b values 5 2
a is big
a is big
```

The image shows a Windows desktop environment. A window titled "TC" is open, displaying the output of a program. The taskbar at the bottom contains several pinned icons, including File Explorer, Edge browser, Task View, File History, Paint, OneDrive, File Explorer again, and Task View again. The system tray shows the date and time as "10:00 AM 09-Dec-24".



```
TC
Enter a, b values 3 3
Both are equal
Both are equal
```

The screenshot shows a Windows desktop environment. At the top, there's a window titled "TC" containing the text "Enter a, b values 3 3", "Both are equal", and "Both are equal". Below this window is a taskbar with several icons for common applications like File Explorer, Task View, and various system tools. On the right side of the taskbar, the date and time are displayed as "10:00 AM 09-Dec-24".

Finding factorial using pointer:

TC

File Edit Run Compile Project Options Debug

Line 13 Col 29 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,*p=&n; long f=1;
clrscr();
printf("Enter n value ");scanf("%d",&n);
while(n>1)
{
f=f*n;
n--;
}
printf("Factorial = %ld", f );
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:03 AM >
09-Dec-24

```
TC
Enter n value 4
Factorial = 24
```

TC

File Edit Run Compile Project Options Debug

Line 16 Col 40 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n,*p=&n; long f=1;
clrscr();
printf("Enter n value ");scanf("%d",&n);
while(*p>1)
{
f=f* *p;
--*p; /* (*p)--; */
}
printf("Factorial = %ld", f );
getch();
}
/* * is having less priority than -- */
```

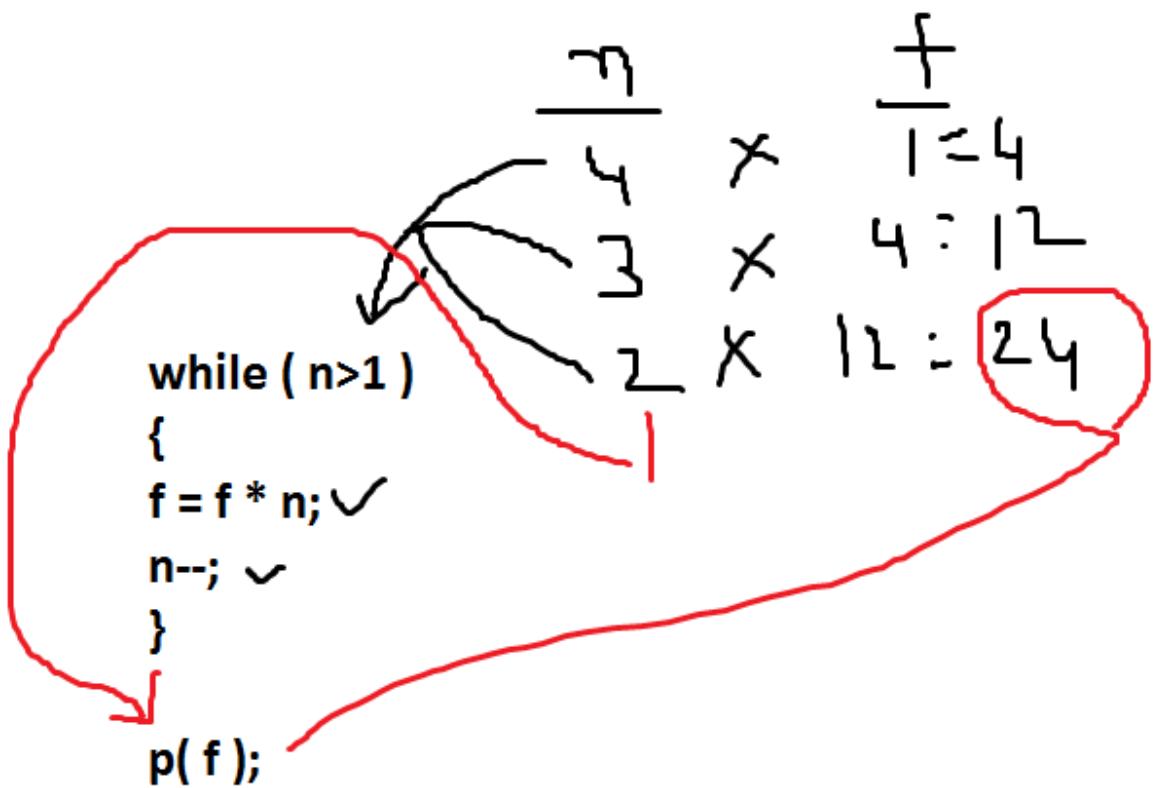
F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:07 AM >
09-Dec-24

```
TC
Enter n value 4
Factorial = 24
```





Finding a normal variable value using pointer technique:

TC

File Edit Run Compile Project Options Debug

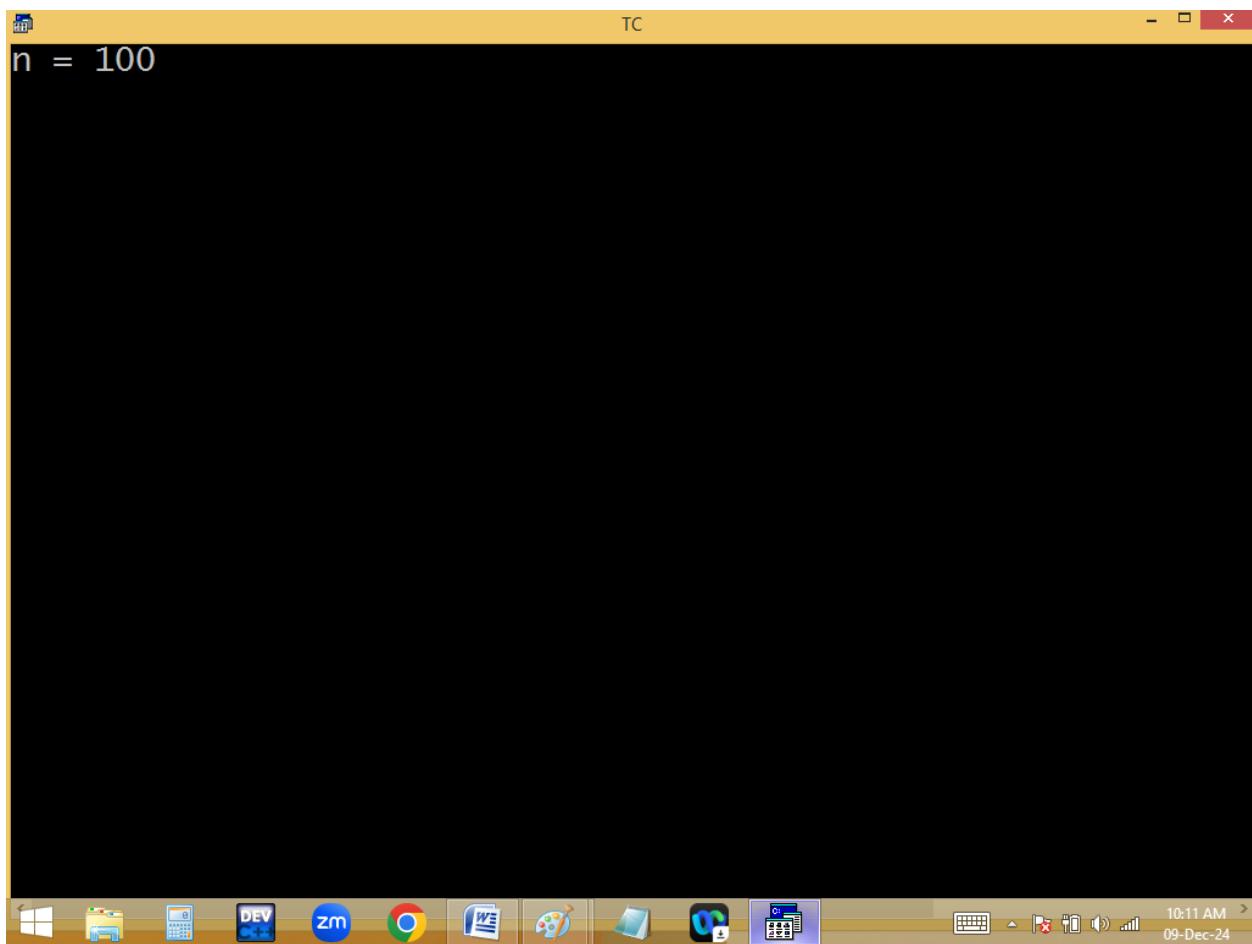
Line 7 Col 21 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int n=100;
clrscr();
printf("n = %d", * &n);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:11 AM >
09-Dec-24



n = 100

Finding pointer size:

Pointer stores always the variable / memory address and it is an unsigned int. due to this any type of pointer it takes 2 / 4 / 8 bytes in 16 / 32 / 64 bit compilers.

TC

File Edit Run Compile Project Options Debug

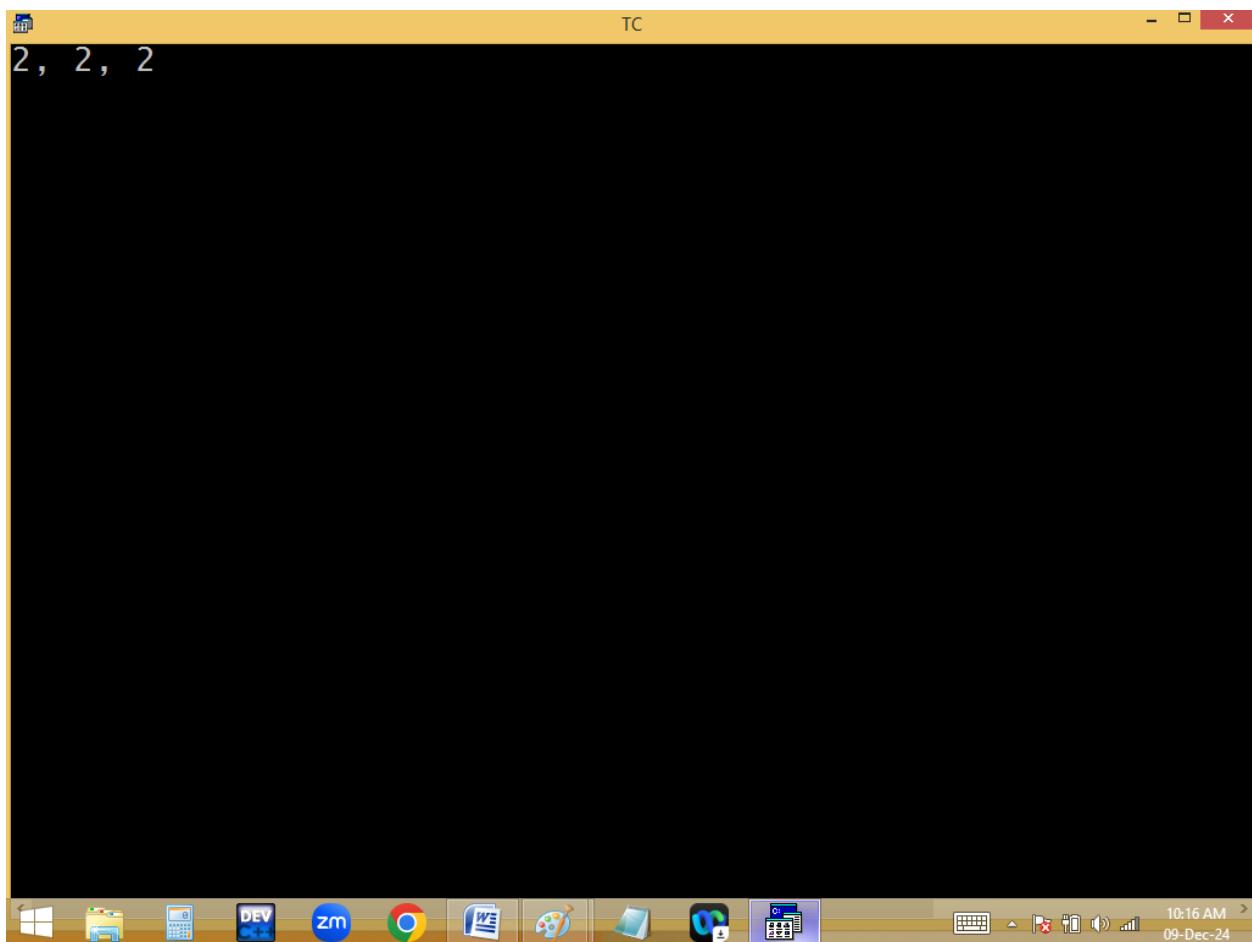
Line 7 Col 52 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int *a; float *b; char *c;
clrscr();
printf("%d, %d, %d", sizeof(a), sizeof(b),sizeof(c));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:16 AM >
09-Dec-24

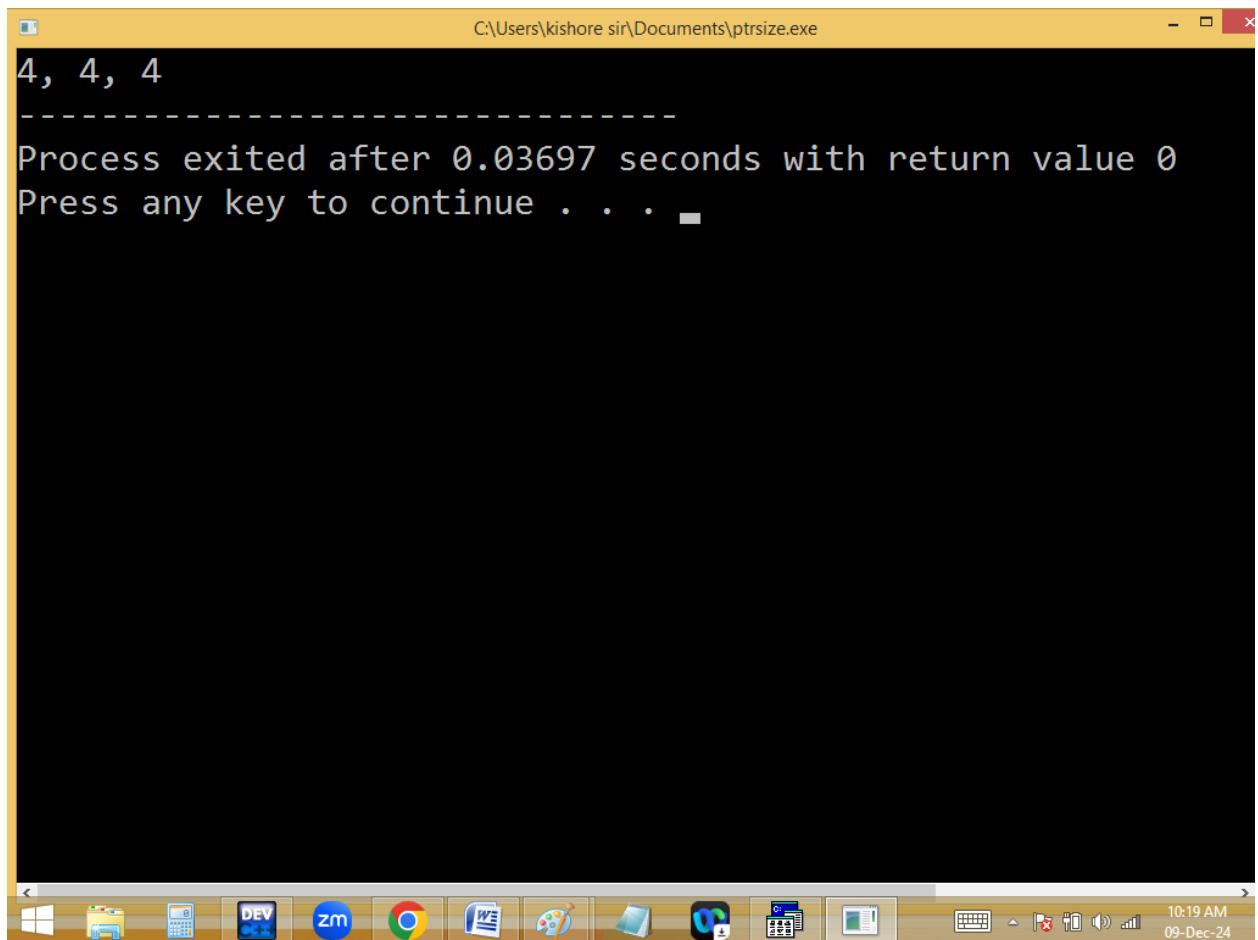


In Dev C++:

```
#include<stdio.h>

int main()
{
    int *a; float *b; char *c;
    printf("%d, %d, %d", sizeof(a), sizeof(b), sizeof(c));
```

}



Online compiler:

The screenshot shows a web browser window for 'Online C Compiler - Programiz'. The URL in the address bar is programiz.com/c-programming/online-compiler/. The page features the Programiz logo and navigation links for WhatsApp, Classroom, Gmail, and other services. A prominent IBM advertisement is displayed. The main area contains a code editor with a C file named 'main.c' containing the following code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int *a; float *b; char *c;
6     printf("%d, %d, %d", sizeof(a), sizeof(b), sizeof(c));
7 }
8
9
10
```

Below the code editor is a toolbar with icons for copy, paste, run, and refresh. The 'Run' button is highlighted in blue. To the right, the 'Output' section displays the results of the program execution:

```
8, 8, 8
==== Code Execution Successful ===
```

Pointer compatibility: Pointer can store only the same type of variable address. When we are providing different type address, it gives either garbage or runtime error.

TC

File Edit Run Compile Project Options Debug

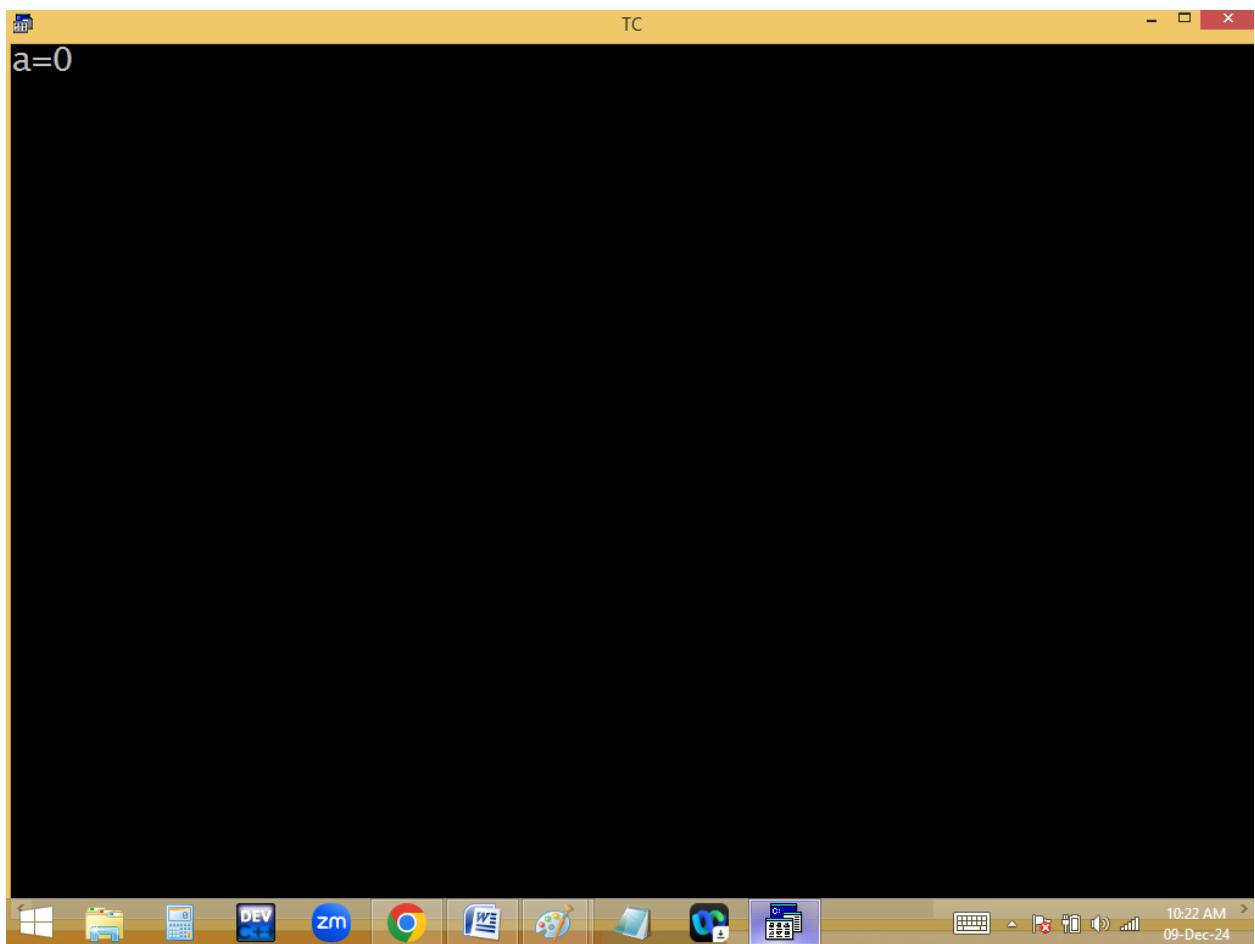
Line 5 Col 23 Insert Indent Tab Fill Unindent E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100; float *p=&a;
clrscr();
printf("a=%d", *p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:22 AM >
09-Dec-24



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the top indicates Line 7, Col 39. The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
float a=10.50; int *p=&a;
clrscr();
printf("a=%f",*p); /* runtime error */
getch();
}
```

The status bar at the bottom shows function keys F1 through F10 and their corresponding functions: Help, Zoom, Switch, Trace, Step, Make, and so on. The taskbar at the bottom displays icons for various applications like Windows, File Explorer, Task View, and others. The system tray shows the date and time as 10:23 AM, 09-Dec-24.

Double pointer / pointer to pointer: the pointer which stores the address of another pointer is called double pointer. It is used to handle dynamic multi dimensional arrays.

TC

File Edit Run Compile Project Options Debug

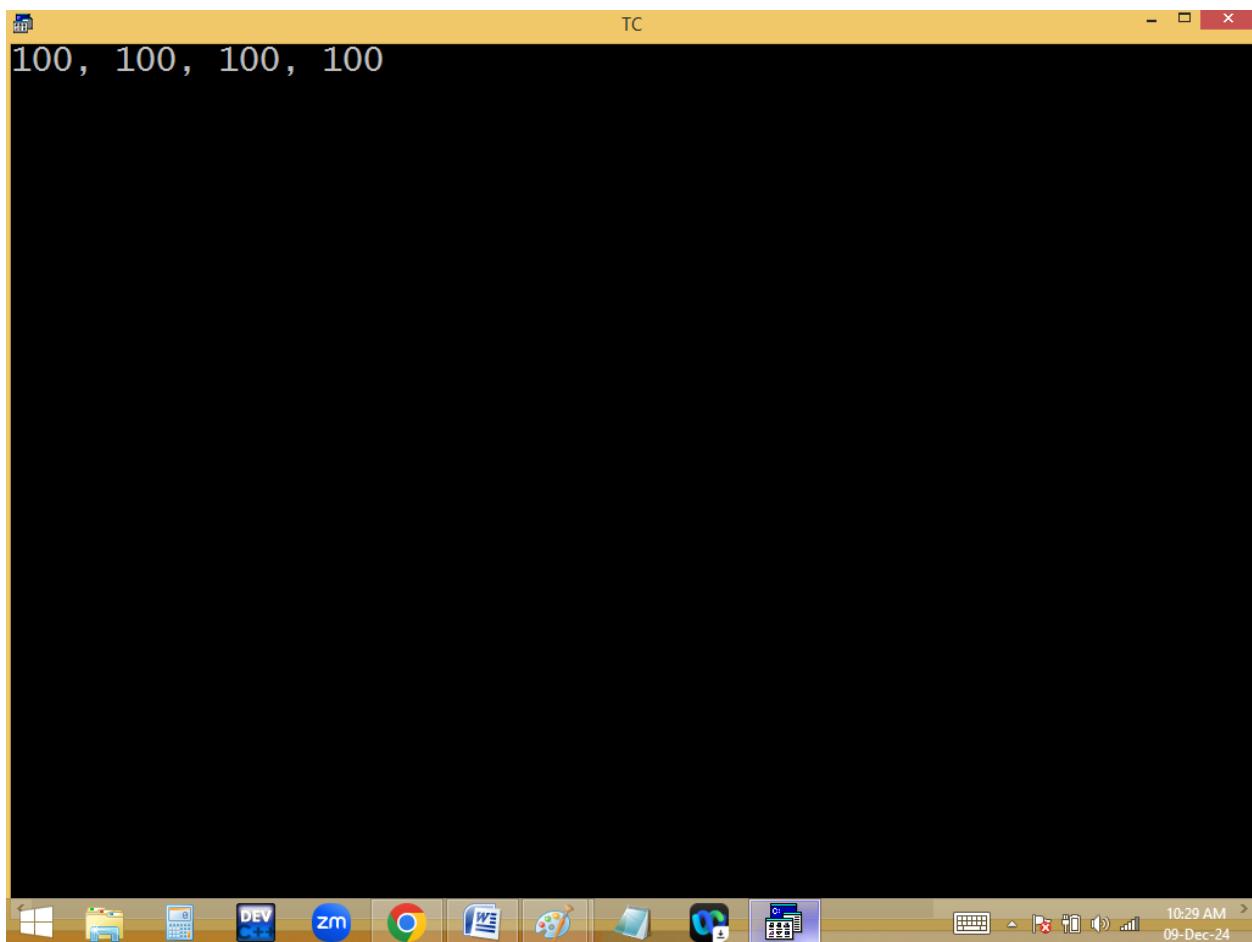
Line 8 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=100, *p=&a, **q=&p, ***r=&q;
clrscr();
printf("%d, %d, %d, %d",a,*p, **q, ***r);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:28 AM >
09-Dec-24



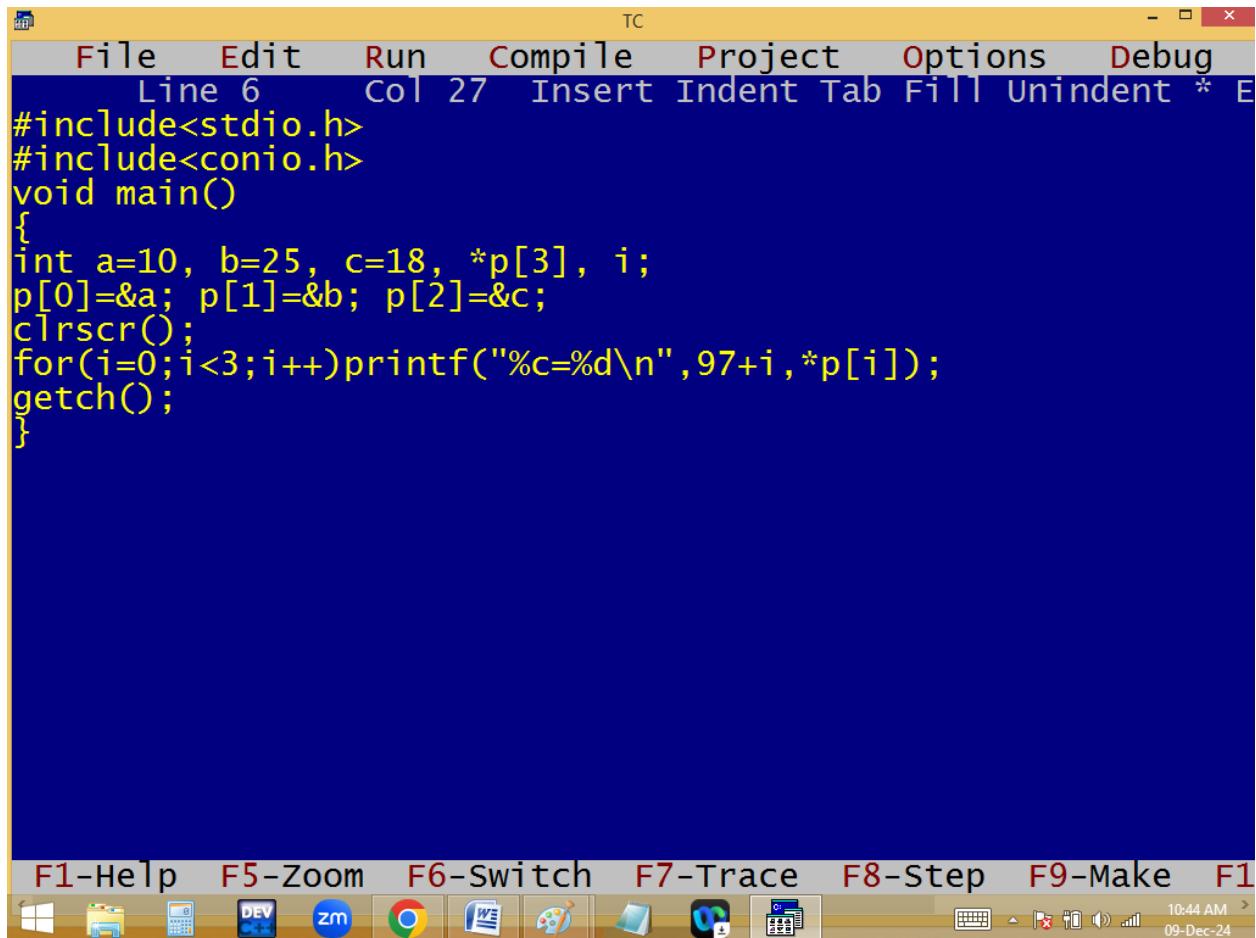
stack

variable	value	addr
r	65504	65506
q	65502	65504
p	65500	65502
a	100	65500

printf(" %d ", * * * r); ==> 100

↗ r value 65504
 ↗ value at 65504 ==> 65502
 ↗ value at 65502 ==> 65500
 ↗ value at 65500 ==> 100

Array of pointer: Like general variables, we can also declare pointer using array. Due to this we can store multiple variable address in a single pointer. It is used to handle dynamic multi dimensional arrays.

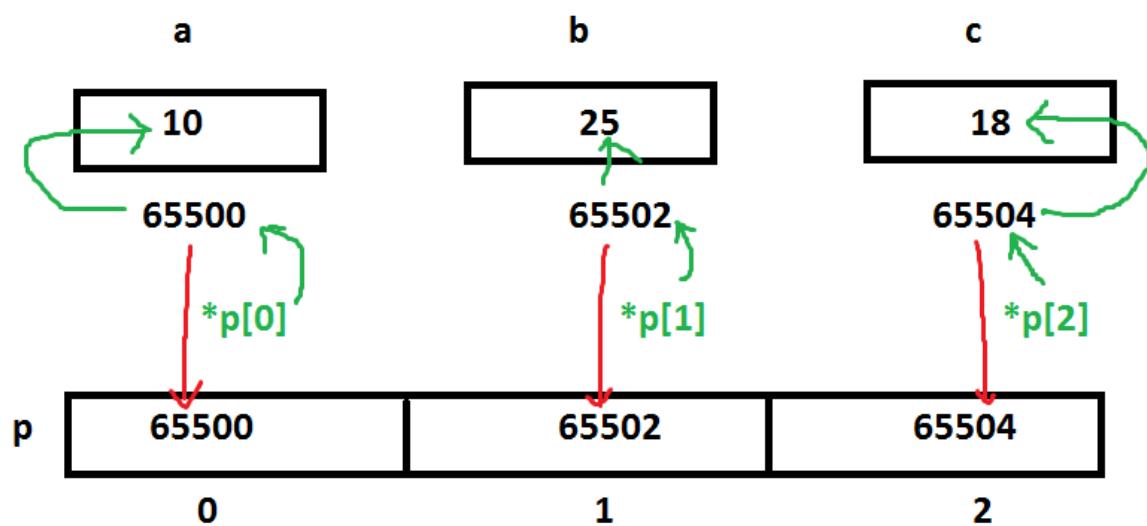


```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a=10, b=25, c=18, *p[3], i;
    p[0]=&a; p[1]=&b; p[2]=&c;
    clrscr();
    for(i=0;i<3;i++)printf("%c=%d\n", 97+i, *p[i]);
    getch();
}
```

```
a=10  
b=25  
c=18
```

TC

10:44 AM 09-Dec-24



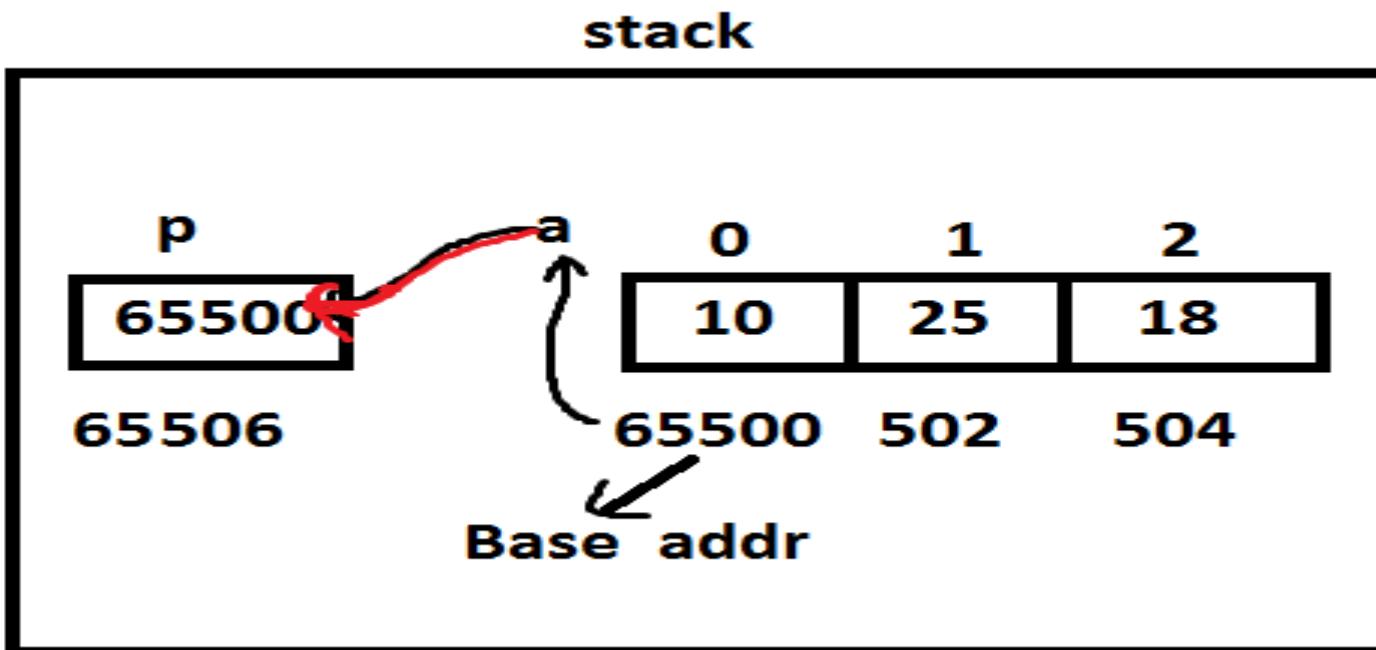
Pointer to array:

Array is implicit pointer. Due to this it holds the base cell addr [0 cell addr] implicitly. By assigning the array name or 0 cell addr to the pointer, we can handle array elements using the following syntax.

`*(ptrvariable + offset/index * sizeof(variable));`

Eg:

```
int a[3]={10, 25, 18}, *p, i;  
p = a ; or p = &a[0]; or p = &a;
```



```
for(i=0;i<3;i++)  
printf("%4d", *(p+i));
```

Here `*(p+i)` meaning is:

`p` is 65500

1. `*(p+0*2) → *65500 → value at 65500 → 10`
2. `*(p+1*2) → *65502 → value at 65502 → 25`

3. $*(p+2*2) \rightarrow *65504 \rightarrow$ value at 65504 $\rightarrow 18$

Note: Here 2 is int size.

Eg:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int *p, a[3]={10,25,18}, i;
    clrscr();
    p = a; /* p=&a[0]; or p=&a; */
    printf("Elements are: ");
    for(i=0;i<3;i++)
        printf("%4d",*(p+i));
    getch();
}
```

Output: Elements are: 10 25 18

Note: We can access array elements using array / pointer in following ways.

a[i] / i[a] / p[i] / i[p] / *(p+i) / *(a+i) / *(i+p) / *(i+a)

TC

File Edit Run Compile Project Options Debug

Line 9 Col 35 Insert Indent Tab Fill Unindent * E

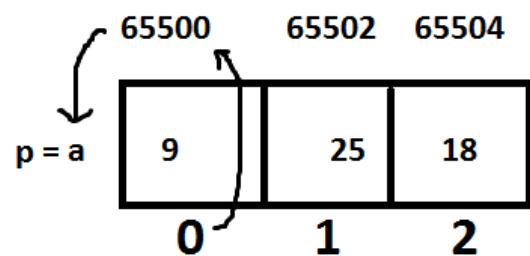
```
#include<stdio.h>
#include<conio.h>
void main()
{
int a[3]={10,25,18}, *p, i;
p=&a[0]; /* p=a; */
clrscr();
puts("Elements are ");
for(i=0;i<3;i++)printf("%4d",*(i+p));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:31 AM >
10-Dec-24

```
TC
Elements are
10 25 18
```



```
for( i=0; i<3;i++ ) p(* ( p + i ) );
```

↓

```
*65500+0*2=*65500==>value at 65500 ==> 9
*65500+1*2=*65502==>value at 65502 ==> 25
*65500+2*2=*65504==>value at 65504 ==> 18
```

Pointer to string:

TC

File Edit Run Compile Project Options Debug

Line 8 Col 27 Insert Indent Tab Fill Unindent * E

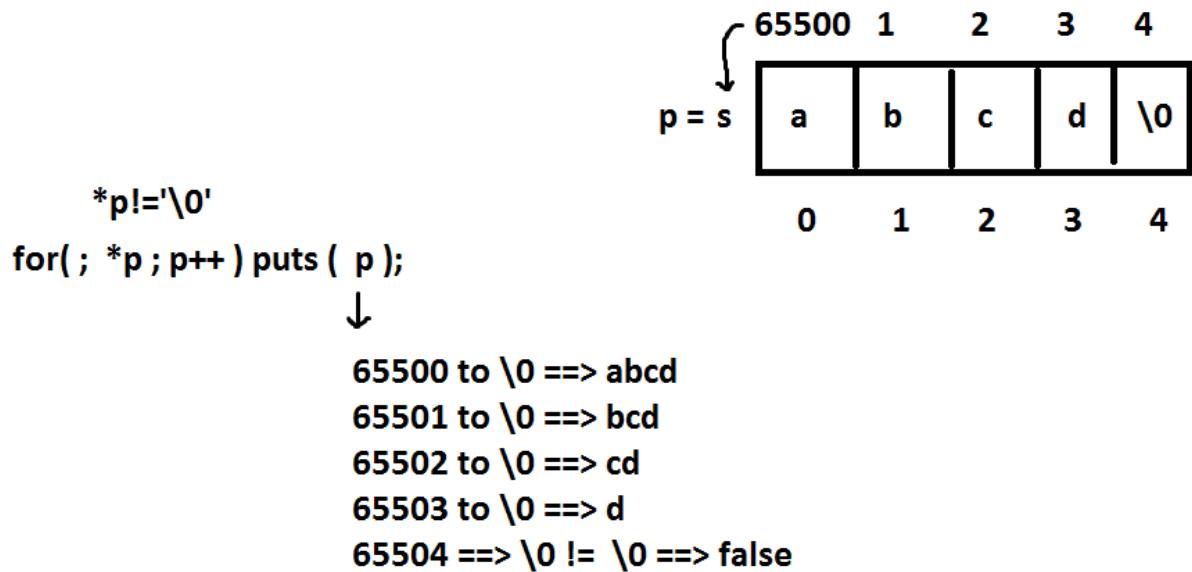
```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100], *p=s;
clrscr();
printf("Enter a string "); gets(s);
for( ; *p ; p++ ) puts(p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:33 AM >
10-Dec-24

```
TC
Enter a string Vanitha
Vanitha
anitha
nitha
itha
tha
ha
a
```



Finding string length using pointer only:

TC

File Edit Run Compile Project Options Debug

Line 9 Col 25 Insert Indent Tab Fill Unindent * E

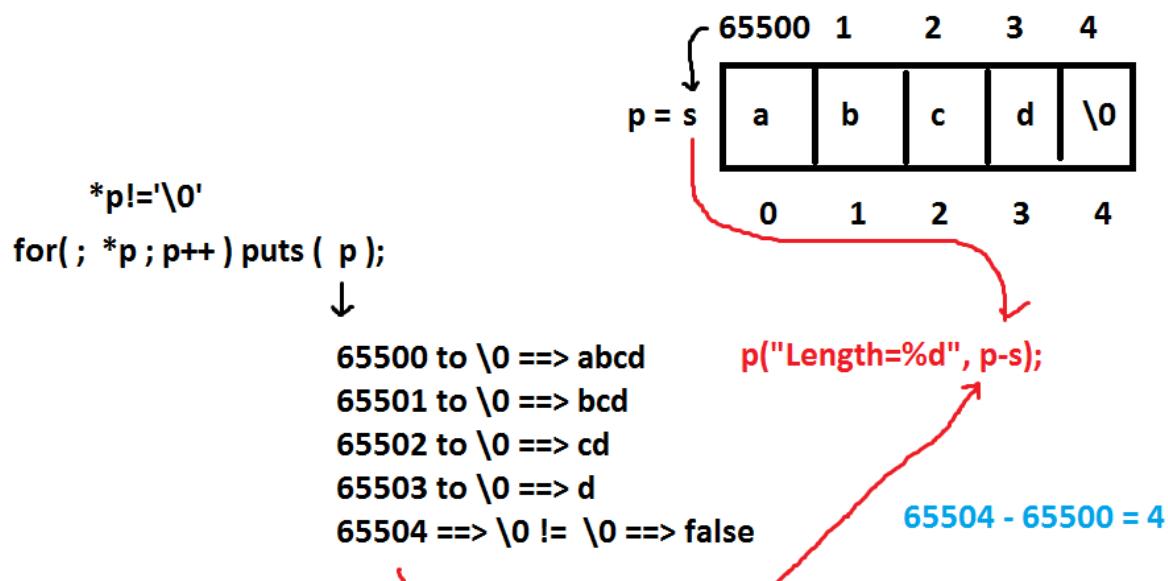
```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100], *p=s;
clrscr();
printf("Enter a string "); gets(s);
for( ; *p]!='\0' ; p++ );
printf("Length=%d", p-s);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

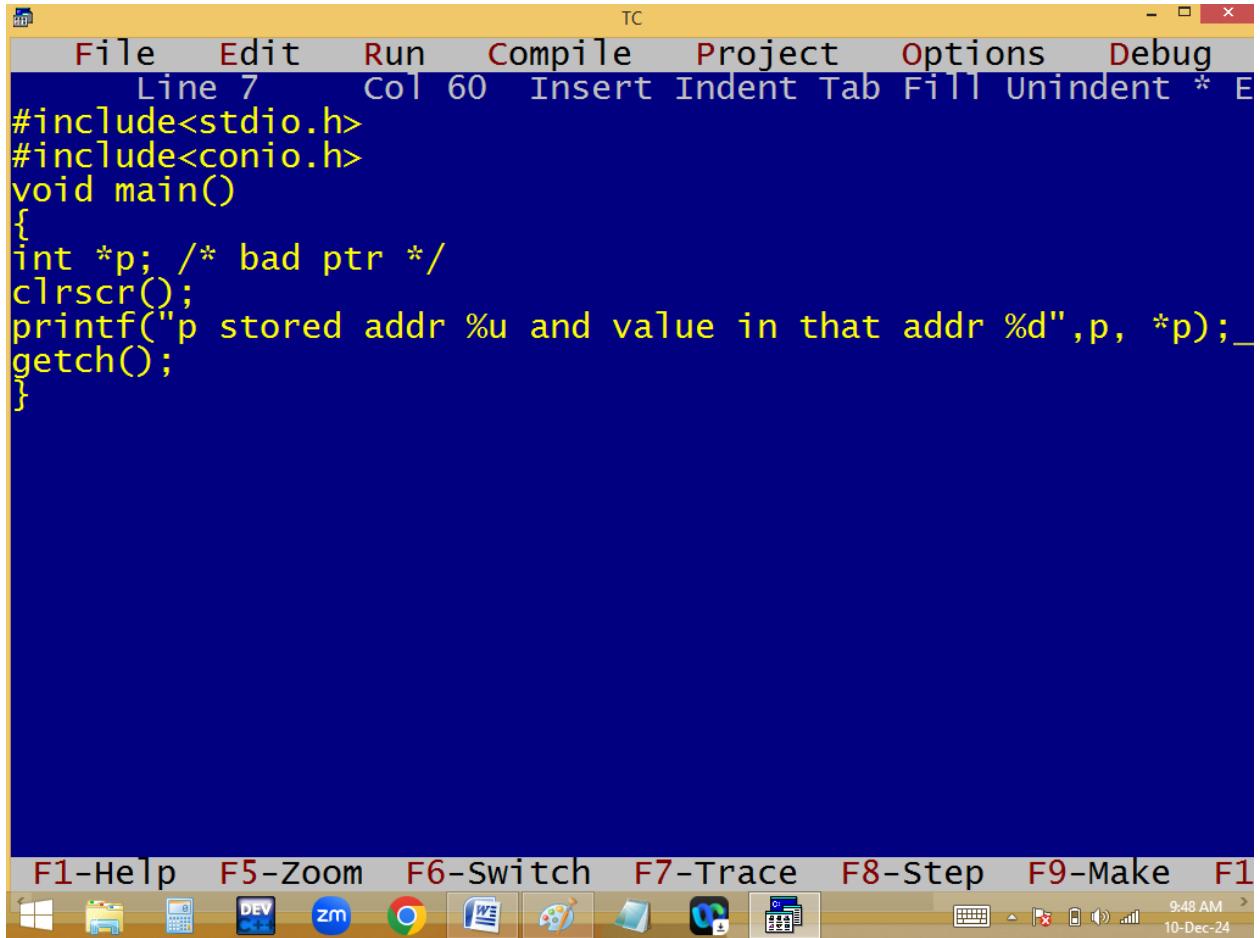


9:43 AM >
10-Dec-24

```
TC
Enter a string Kishore
Length=7
```



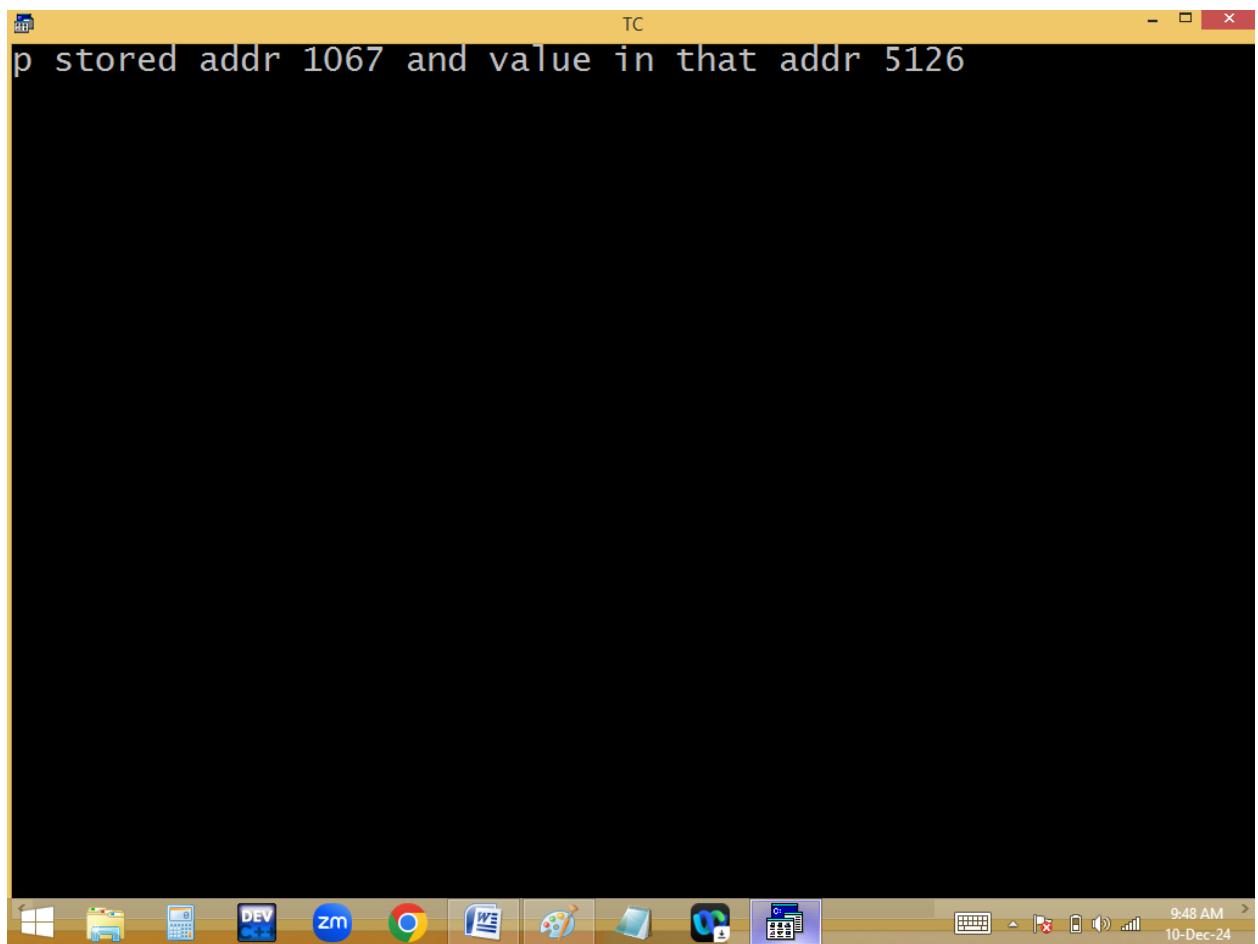
Bad / wild pointer: A pointer is declared but not initialized. In this situation the pointer is storing some unknown value and address. This kind of pointer is called bad / wild pointer.



The screenshot shows the Turbo C++ IDE interface. The menu bar includes File, Edit, Run, Compile, Project, Options, and Debug. The status bar at the bottom shows "Line 7 Col 60". The code editor contains the following C code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int *p; /* bad ptr */
    clrscr();
    printf("p stored addr %u and value in that addr %d",p, *p);
    getch();
}
```

The F1 key is highlighted in red, indicating it is the current key being used or selected.



A screenshot of a Windows desktop environment. At the top, there is a taskbar with various icons for applications like File Explorer, Control Panel, and system tools. In the center, a terminal window titled "TC" is open, displaying the command "p stored addr 1067 and value in that addr 5126". The desktop background is a solid light color.

NULL pointer: When a pointer initialized with 0 / NULL then it is a NULL pointer. To avoid bad and dangling pointers we are using NULL pointer.

TC

File Edit Run Compile Project Options Debug

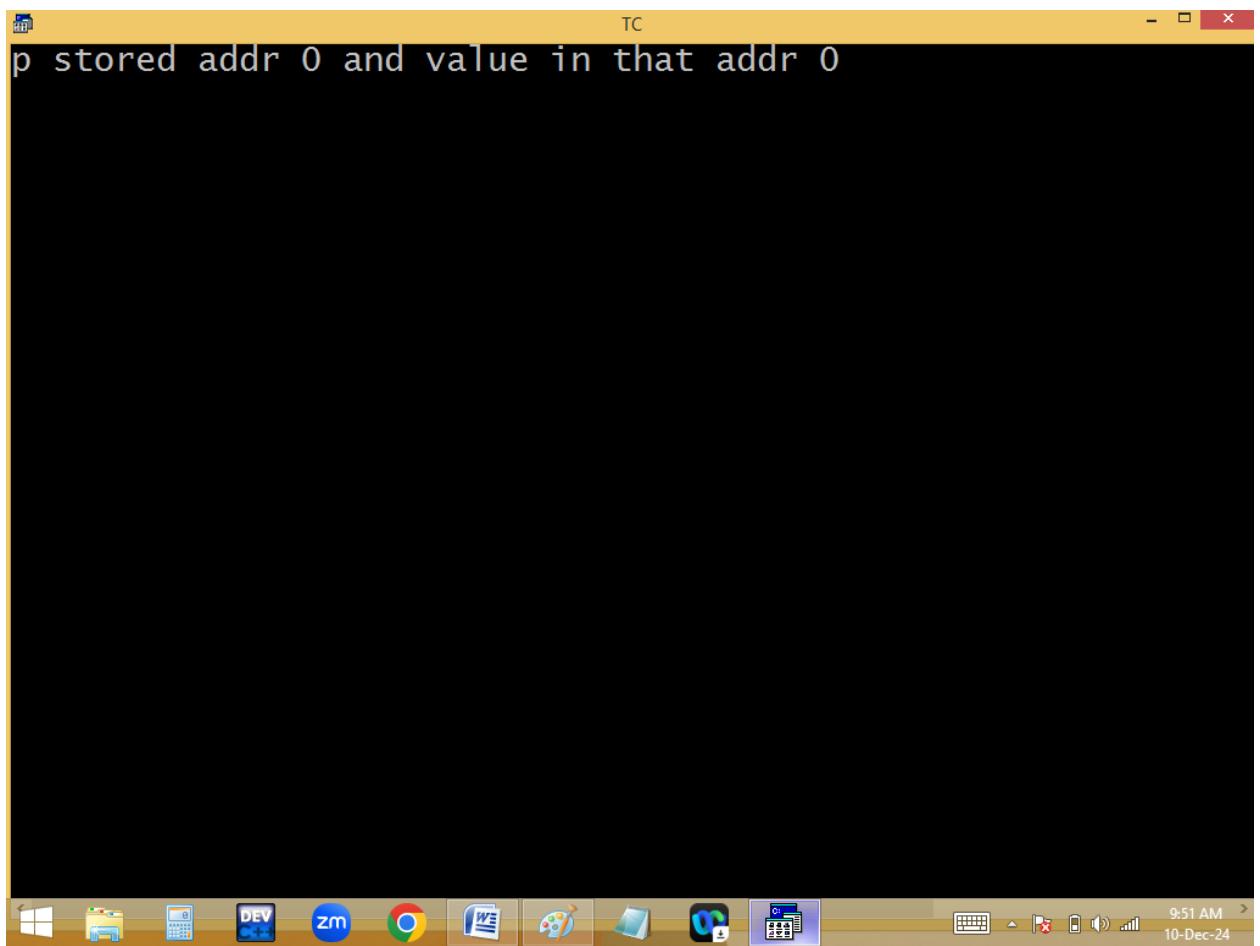
Line 5 Col 9 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int *p=0; /* NULL ptr */
clrscr();
printf("p stored addr %u and value in that addr %d",p, *p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:50 AM >
10-Dec-24



TC

File Edit Run Compile Project Options Debug

Line 5 Col 12 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int *p=NULL; /* NULL ptr */
clrscr();
printf("p stored addr %u and value in that addr %d",p, *p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



9:51 AM >
10-Dec-24

A screenshot of a Windows desktop environment. At the top, there is a taskbar with various icons for applications like File Explorer, Control Panel, and system tools. Below the taskbar is a large black command-line window titled 'TC'. The window contains the text 'p stored addr 0 and value in that addr 0' in white. In the bottom right corner of the desktop, there is a system tray showing the date and time as '9:51 AM 10-Dec-24'.

```
p stored addr 0 and value in that addr 0
```

Dangling pointer: A pointer is declared and some variable address also assigned. After some time that variable deleted from memory. But still the pointer is storing that deleted variable value and address. This kind of pointers are called dangling pointer and to avoid this initialize with NULL pointer.

TC

File Edit Run Compile Project Options Debug

Error: Undefined symbol 'a' in function main

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int *p; /* bad ptr */
    clrscr();
{
    int a=100; /* local var */
    p = &a;
    printf("a=%d\n", *p);
}/* a deleted */
printf("a=%d", a);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

9:53 AM >
10-Dec-24

TC

File Edit Run Compile Project Options Debug

Line 14 Col 19 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int *p; /* bad ptr */
    clrscr();
{
    int a=100; /* local var */
    p = &a;
    printf("a=%d\n", *p);
}/* a deleted */
printf("a=%d\n", *p); /* dangling pointer */
p=NULL; /* NULL ptr */
printf("a=%d", *p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:07 AM >
10-Dec-24

a=100
a=100
a=0

void / generic pointer: Pointer can store only the same type of address. Void pointer can store any type of variable address. But before going to use void pointer, explicit type casting should be provided. Void pointer takes 2 bytes and used in dynamic memory allocation.

TC

File Edit Run Compile Project Options Debug

Line 13 Col 44 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10; float b=1.2; char c='X';
void *p;
clrscr();
p = &a;
printf("a=%d\n",*(int*)p); /* explicit type casting */
p = &b;
printf("b=%f\n",*(float*)p);
p = &c;
printf("c=%c\n",*(char*)p);
printf("void ptr size %d bytes",sizeof(p));
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:23 AM 10-Dec-24

```
a=10
b=1.200000
c=X
void ptr size 2 bytes_
```

The screenshot shows a Windows desktop environment. At the top is a taskbar with several pinned icons: File Explorer, Task View, Start, Microsoft Edge, Google Chrome, File Explorer again, Paint 3D, File Explorer again, and File Explorer again. To the right of the taskbar are system status icons for battery, signal, and volume, along with the date and time (10:23 AM, 10-Dec-24). Below the taskbar is a black terminal window titled "TC". Inside the terminal, there is some text output:
a=10
b=1.200000
c=X
void ptr size 2 bytes_. The rest of the terminal window is blank.

Abbreviation:

Ranam Rudhiram Raudram – R R R

TC

File Edit Run Compile Project Options Debug

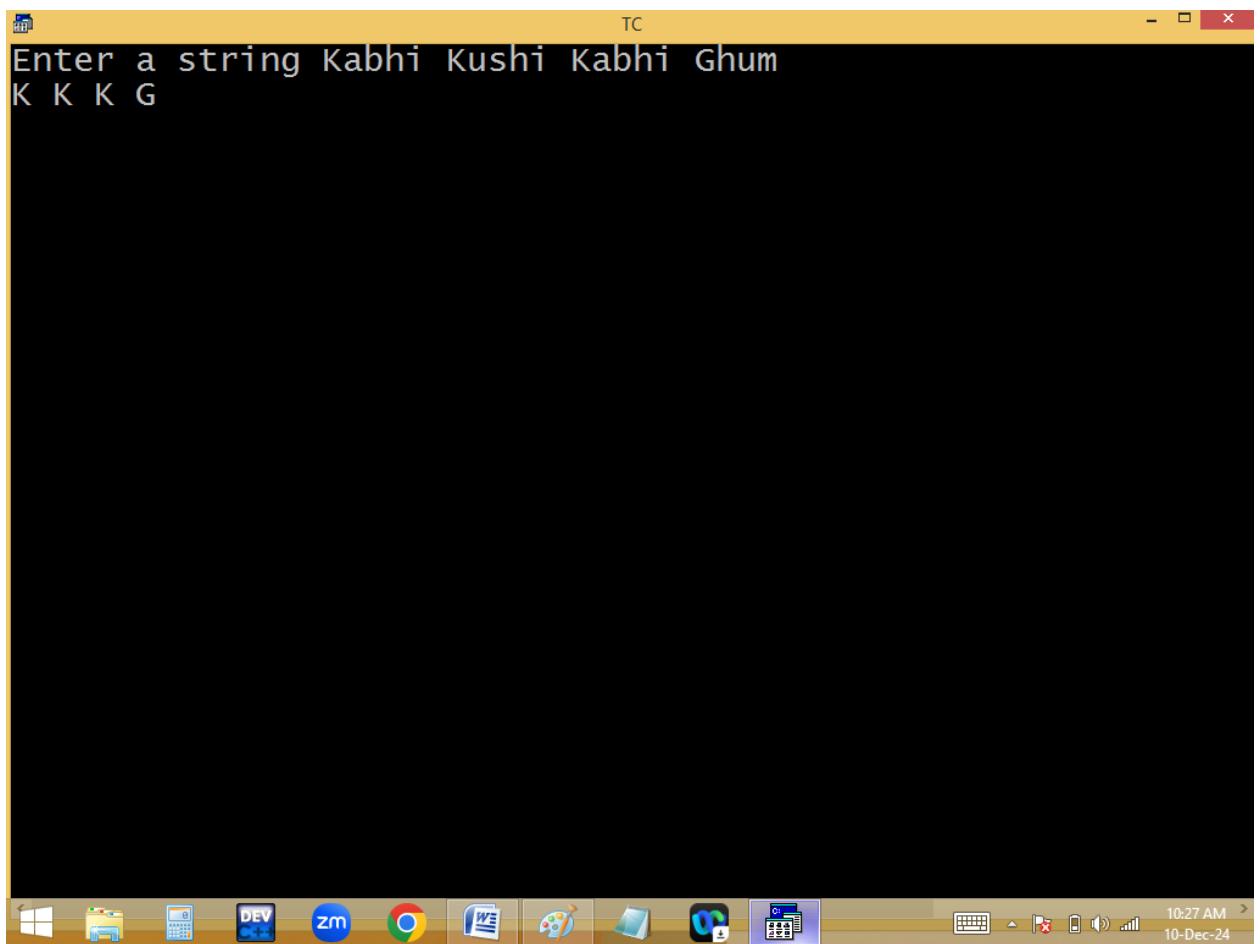
Line 11 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100], *p; int i;
clrscr();
printf("Enter a string "); gets(s);
if(s[0]!=' ')printf("%c ",s[0]);
for(i=0;s[i]!='\0';i++)
if(s[i]!=' ' && s[i-1]==' ') printf("%c ",s[i]);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:27 AM >
10-Dec-24



```
Enter a string      United States  
U S _
```

TC

File Edit Run Compile Project Options Debug

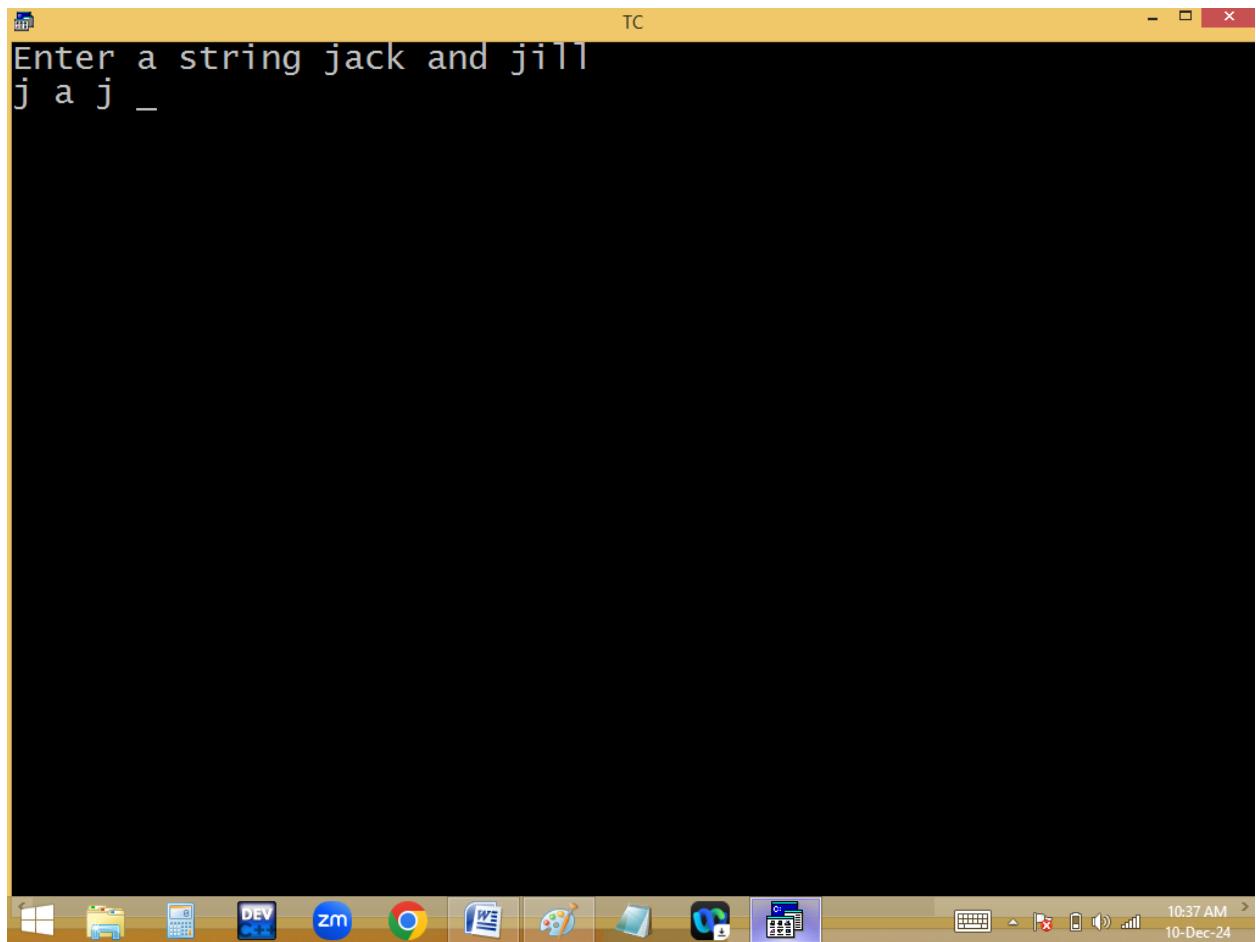
Line 10 Col 19 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
char s[100], *p=s; int i;
clrscr();
printf("Enter a string "); gets(s);
if(*p==' ')printf("%c ",*p);
for( ;*p;p++)
if((*p)!=' ' && *(p-1)==' ') printf("%c ",*p);
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:37 AM 10-Dec-24



```
Enter a string jack and jill
j a j _
```

Pointer arithmetic:

Like normal variables we can do copy, comparison, +, -, ++ and - - on pointers also. But we can't do *, % and / on pointers.

TC

File Edit Run Compile Project Options Debug

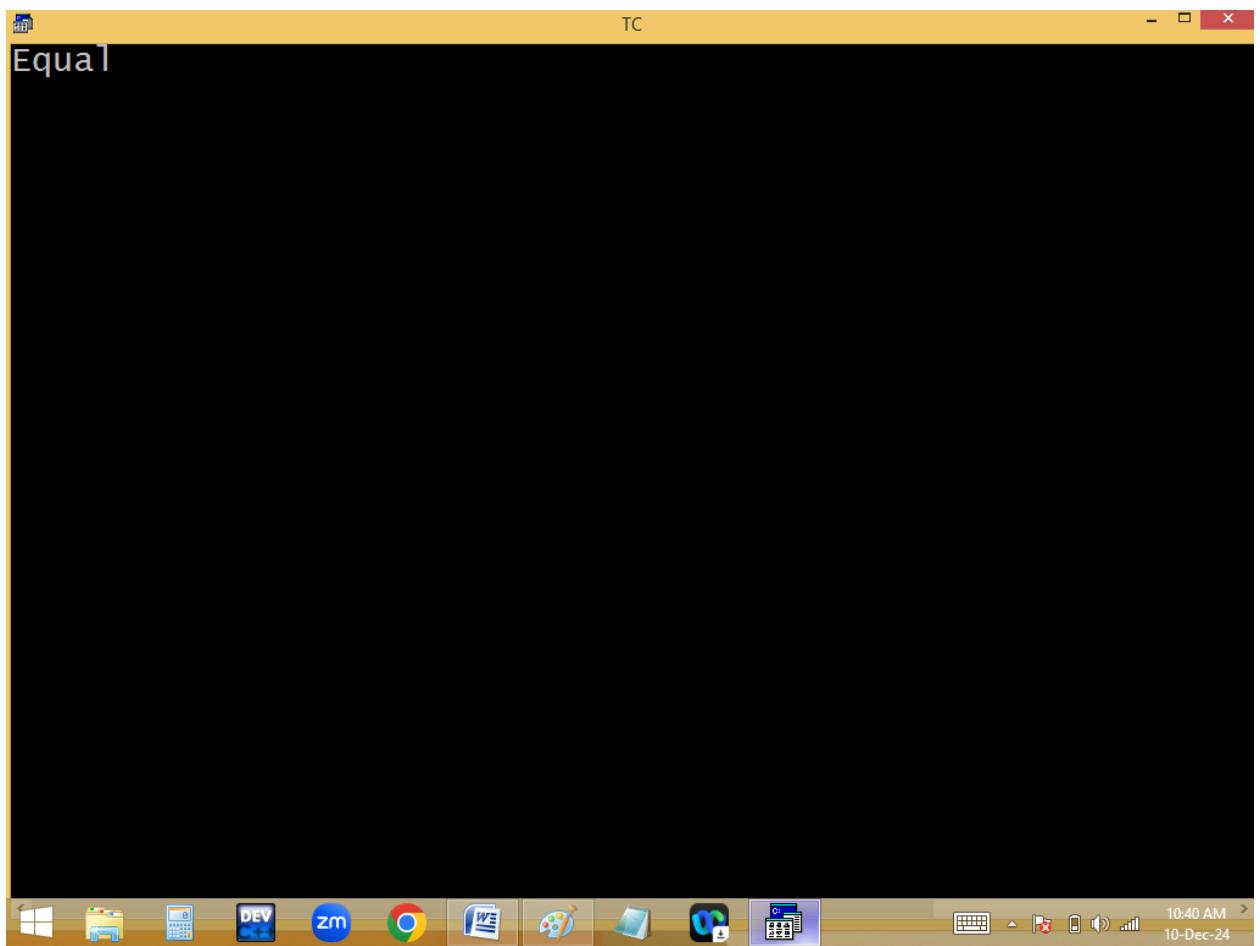
Line 7 Col 33 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, *p=&a, *q=p;
clrscr();
puts(p==q ? "Equal": "Not Equal");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:40 AM >
10-Dec-24



TC

File Edit Run Compile Project Options Debug

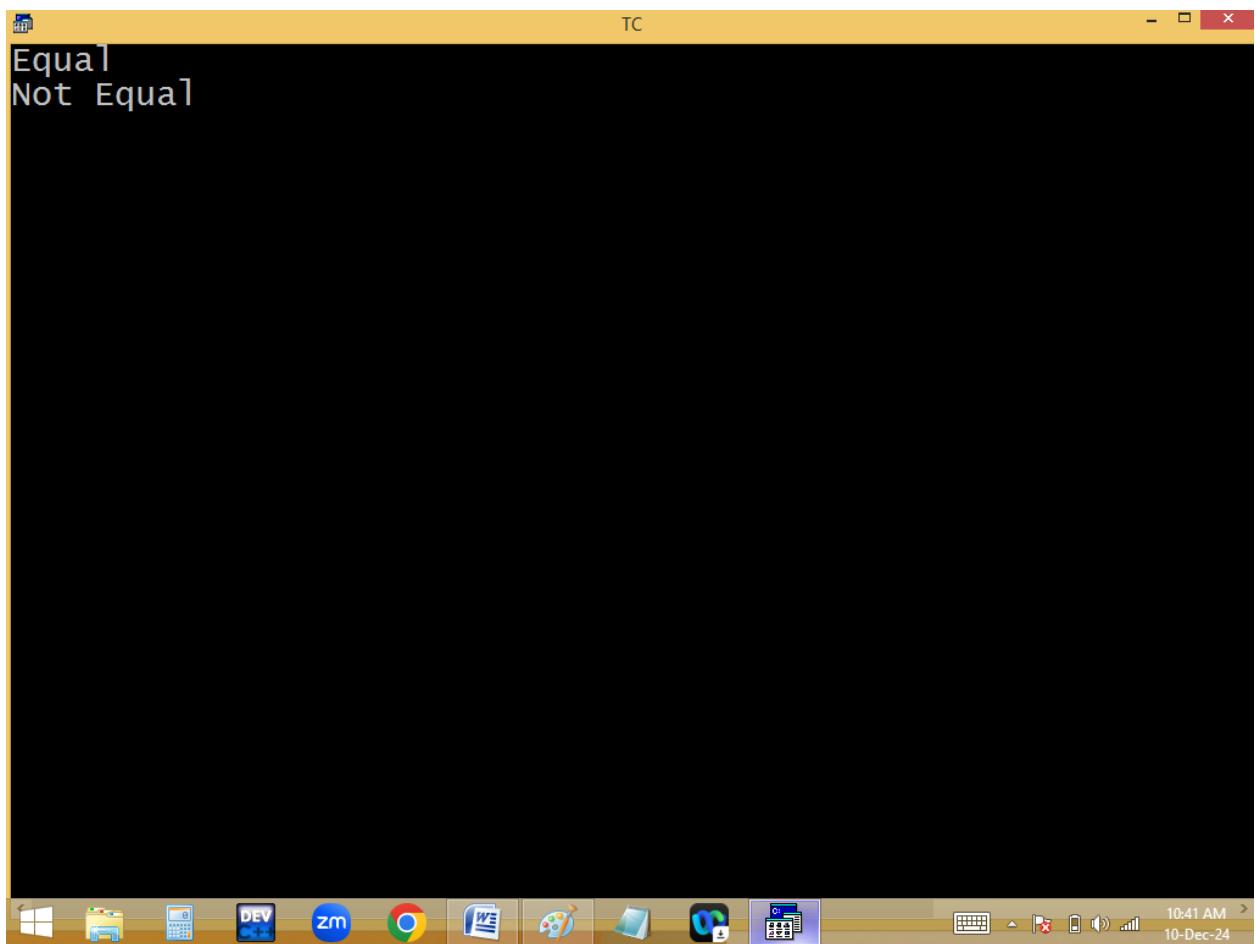
Line 9 Col 1 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, *p=&a, *q=p;
clrscr();
puts(p==q ?"Equal":"Not Equal");
q=NULL;
puts(p==q ?"Equal":"Not Equal");
getch();
}
```

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:41 AM >
10-Dec-24



TC

File Edit Run Compile Project Options Debug
Line 9 Col 7 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, *p=&a, *q=p;
clrscr();
p=p*2;
p=p%2;
p=p/2;
getch();
}
```

Compiling

Main file: 9AM.C
Compiling: EDITOR → 9AM.C

	Total	File
Lines compiled:	321	321
Warnings:	1	1
Errors:	3	3

Available memory: 250K
Errors : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F10-Find F11-Find Next F12-Find Previous

10:42 AM 10-Dec-24

TC

File Edit Run Compile Project Options Debug

Line 5 Col 16 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, *p=&a;
clrscr();
p=p+2;
p=p-2;
getch();
}
```

Linking

EXE file : 9AM.EXE
Linking : LIB\CS.LIB

	Total	Link
Lines compiled:	323	PASS 2
Warnings:	0	0
Errors:	0	0

Available memory: 250K

Success : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1

Windows Taskbar icons: File Explorer, Task View, Start, Google Chrome, Microsoft Edge, Paint, File Manager, Task Scheduler, Task View, Date/Time (10:42 AM, 10-Dec-24)

TC

File Edit Run Compile Project Options Debug

Line 10 Col 5 Insert Indent Tab Fill Unindent * E

```
#include<stdio.h>
#include<conio.h>
void main()
{
int a=10, *p=&a;
clrscr();
p++;
p--;
++p;
--p;
getch();
}
```

Linking

EXE file : 9AM.EXE
Linking : LIB\CS.LIB

	Total	Link
Lines compiled:	325	PASS 2
Warnings:	0	0
Errors:	0	0

Available memory: 250K

Success : Press any key

F1-Help F5-Zoom F6-Switch F7-Trace F8-Step F9-Make F1



10:43 AM >
10-Dec-24

