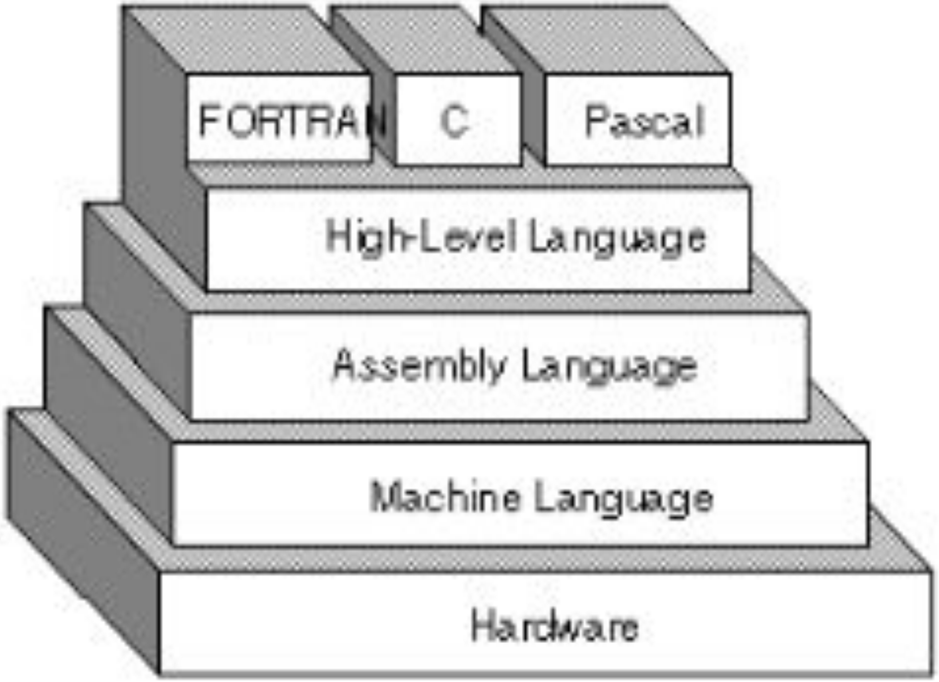
INTRODUCTION TO C++

Programming language

A programming language is a **set of grammatical rules for instructing a computer or computing device** to perform specific tasks.
It is an **high-level languages**, such as BASIC, C, C++, COBOL, Java, FORTRAN, Ada, and Pascal.



Two types of Programming language:

1. Procedural Programming

2. Object Oriented Programming:

Procedural Programming:

- Procedural Programming can be defined as a programming model which is derived from **structured programming, based upon the concept of calling procedure**.
- There is **no access specifier** in procedural programming i.e. public, private etc.
- **Adding new data and function** is not easy.
- Procedural programming does not have any proper way for hiding data so it is ***less secure***.
- Examples: C, FORTRAN, Pascal, Basic etc.

Object Oriented Programming:

- Object oriented programming can be defined as a programming model which is based upon the **concept of objects**. Objects contain data in the form of **attributes(variables or data)** and code in the form of **methods(functions)**.
- Object oriented programming **have access specifiers** like private, public etc.
- **Adding new data and function** is easy.
- Object oriented programming provides data hiding so it is ***more secure***.
- Examples: C++, Java, Python, C# etc.

OVERVIEW OF C++

- C++ is a **multi-paradigm** that supports object-oriented programming.
- **It is an high level language** □developed by **Bjarne Stroustrup (Bell Labs, 1983)**
- started as extension to C by adding new features
- It is used for programers to **develop computer software.**

Structure of C++

1. Header File
2. Main function
3. Variable declarations or code

Note:

a. Every statement ends with ;(semicolon).
b. Main function or function start and end with {} (curly braces)

1. Header File

Header files contain definitions of **Functions and Variables**, which is imported or used into any C++ program

E.g.

#include<iostream.h>

- iostream stands for standard input output stream.
- This **header file contains definitions** to objects like cin(input) and cout(output).

Explanation:

#include is pre-processor in C++

Header file have an extension **".h"**

2. Main function

```
void main( )
{

}
```

3. Code or Variable declaration

E.g. :

Write a c++ program to display “**Welcome to Bioinformatics**” as output on screen

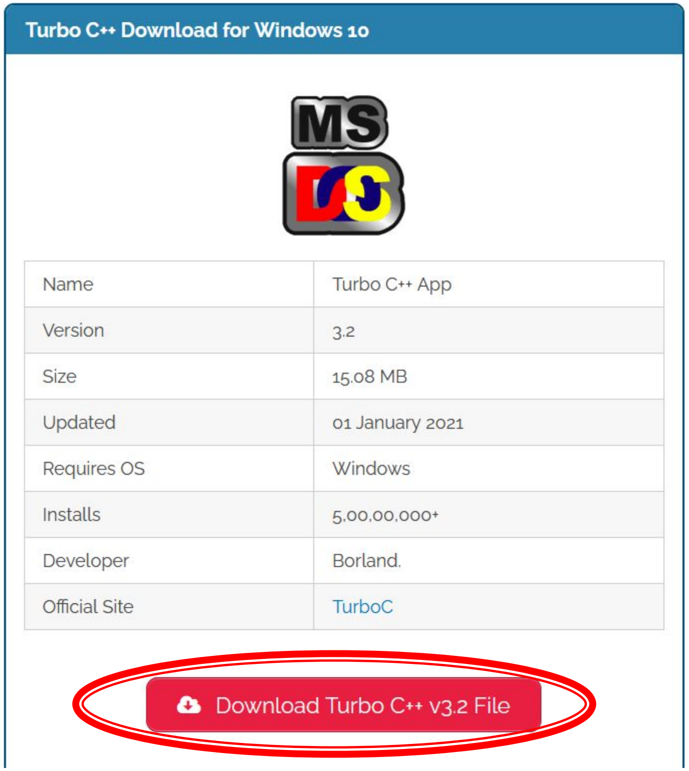
```
#include<iostream.h>
void main()
{
cout<<“Welcome to Bioinformatics”
}
```

Output:

```
Welcome to Bioinformatics
```

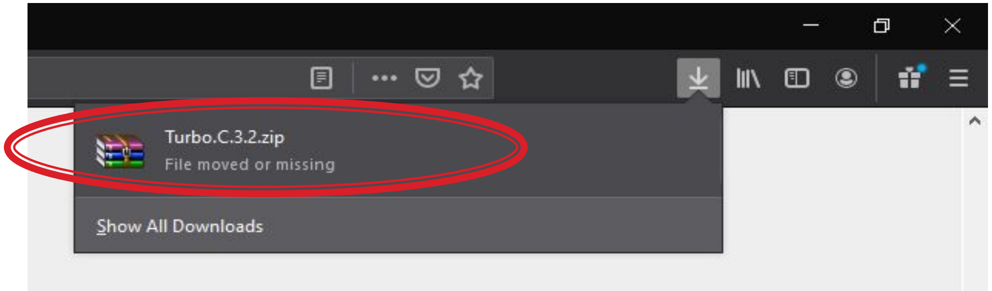
Install Turbo C++

https://turboc.me/download-turbo-c-file/



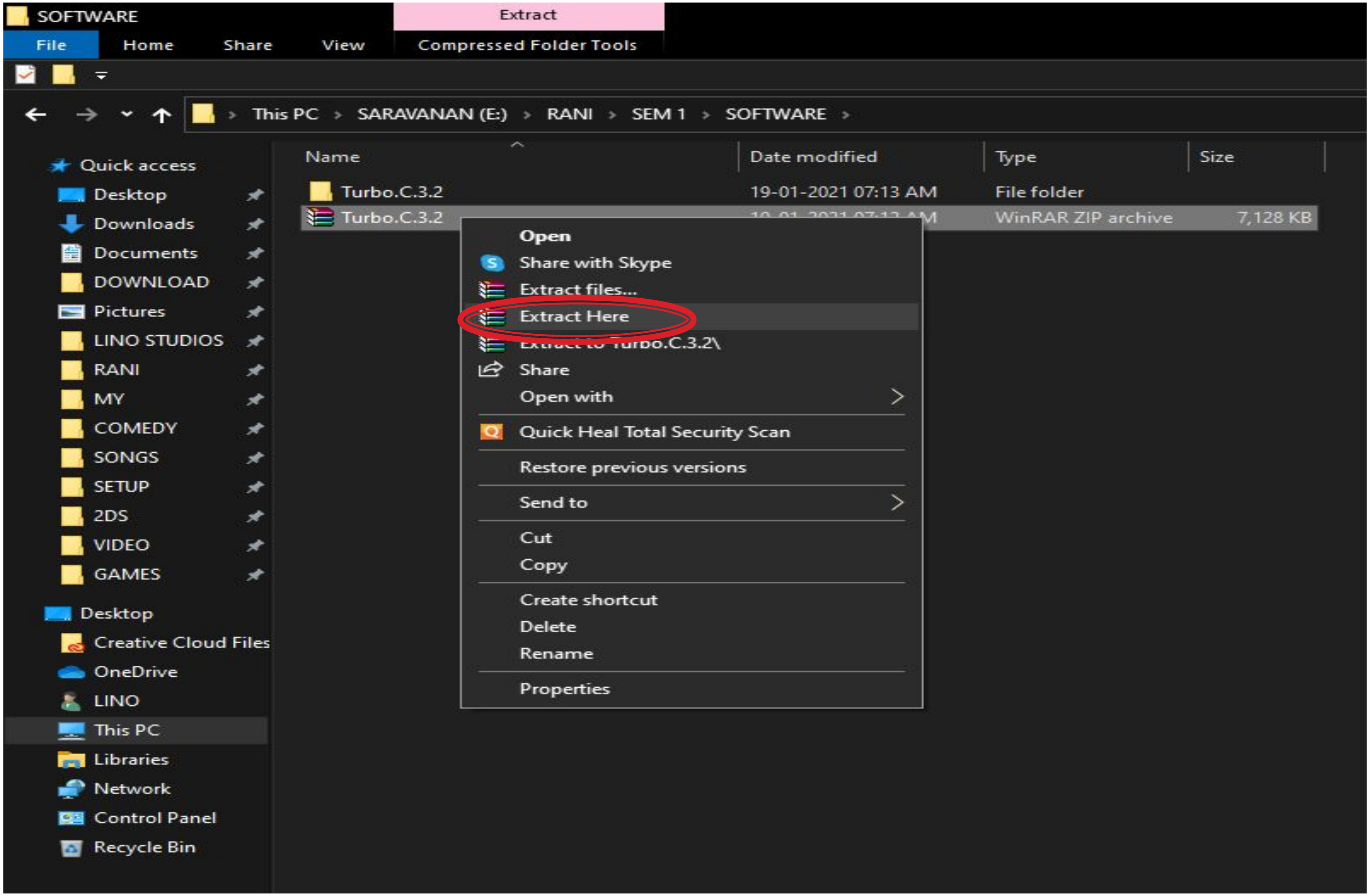
Turbo C++ Download for Windows 10

Name	Turbo C++ App
Version	3.2
Size	15.08 MB
Updated	01 January 2021
Requires OS	Windows
Installs	5,00,00,000+
Developer	Borland.
Official Site	TurboC

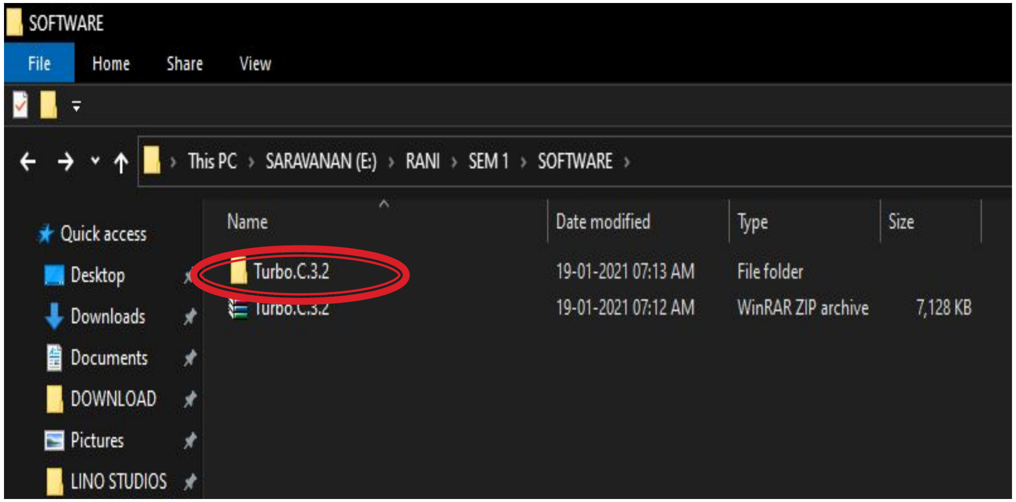


Turbo.C.3.2.zip
File moved or missing

Right click on file□click on extract file

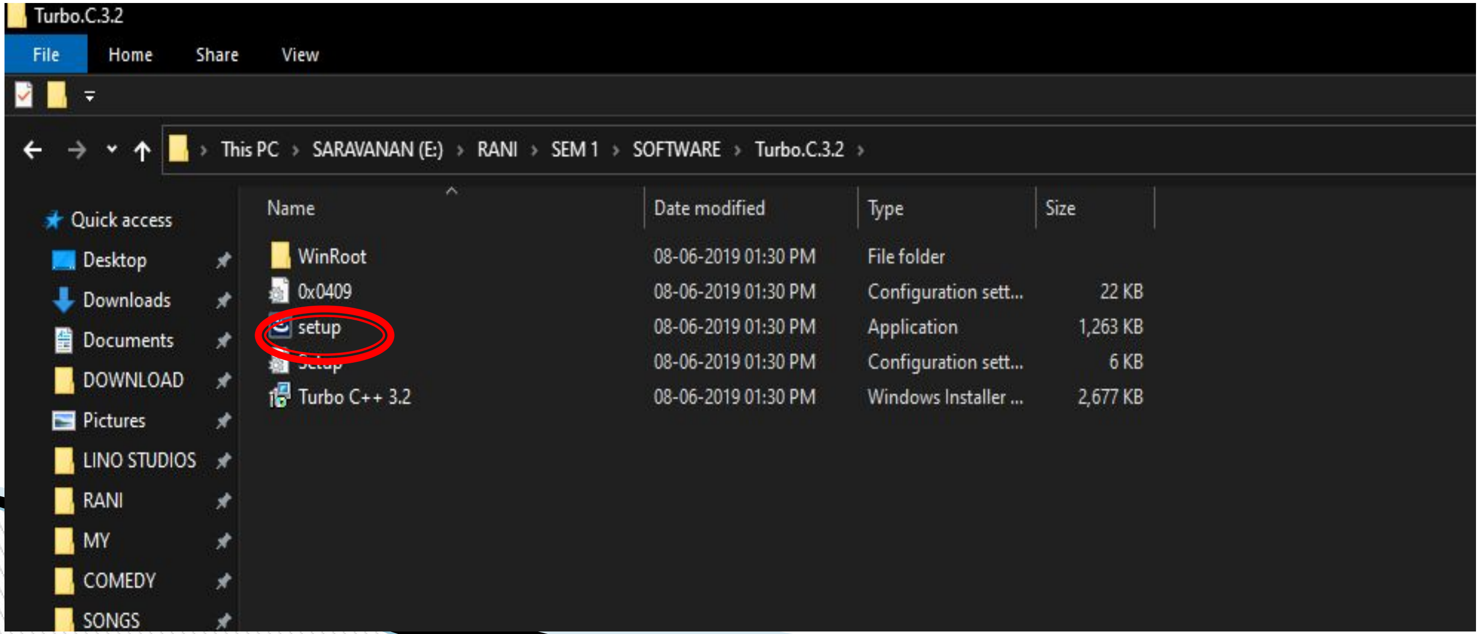


Open extracted folder(Double click on the folder)

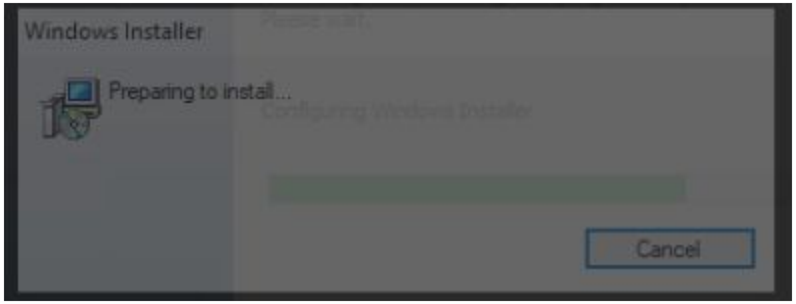


Name	Date modified	Type	Size
Turbo.C.3.2	19-01-2021 07:13 AM	File folder	
Turbo.C.3.2	19-01-2021 07:12 AM	WinRAR ZIP archive	7,128 KB

Double click on the setup i.e application



Name	Date modified	Type	Size
WinRoot	08-06-2019 01:30 PM	File folder	
0x0409	08-06-2019 01:30 PM	Configuration sett...	22 KB
setup	08-06-2019 01:30 PM	Application	1,263 KB
Setup	08-06-2019 01:30 PM	Configuration sett...	6 KB
Turbo C++ 3.2	08-06-2019 01:30 PM	Windows Installer ...	2,677 KB

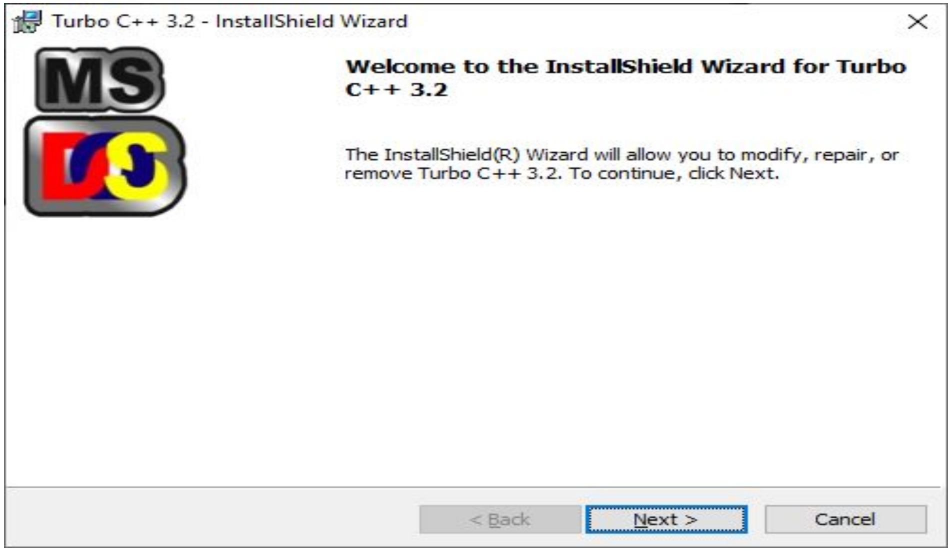


Windows Installer

Preparing to install...

Please wait...

Configuring Windows Installer

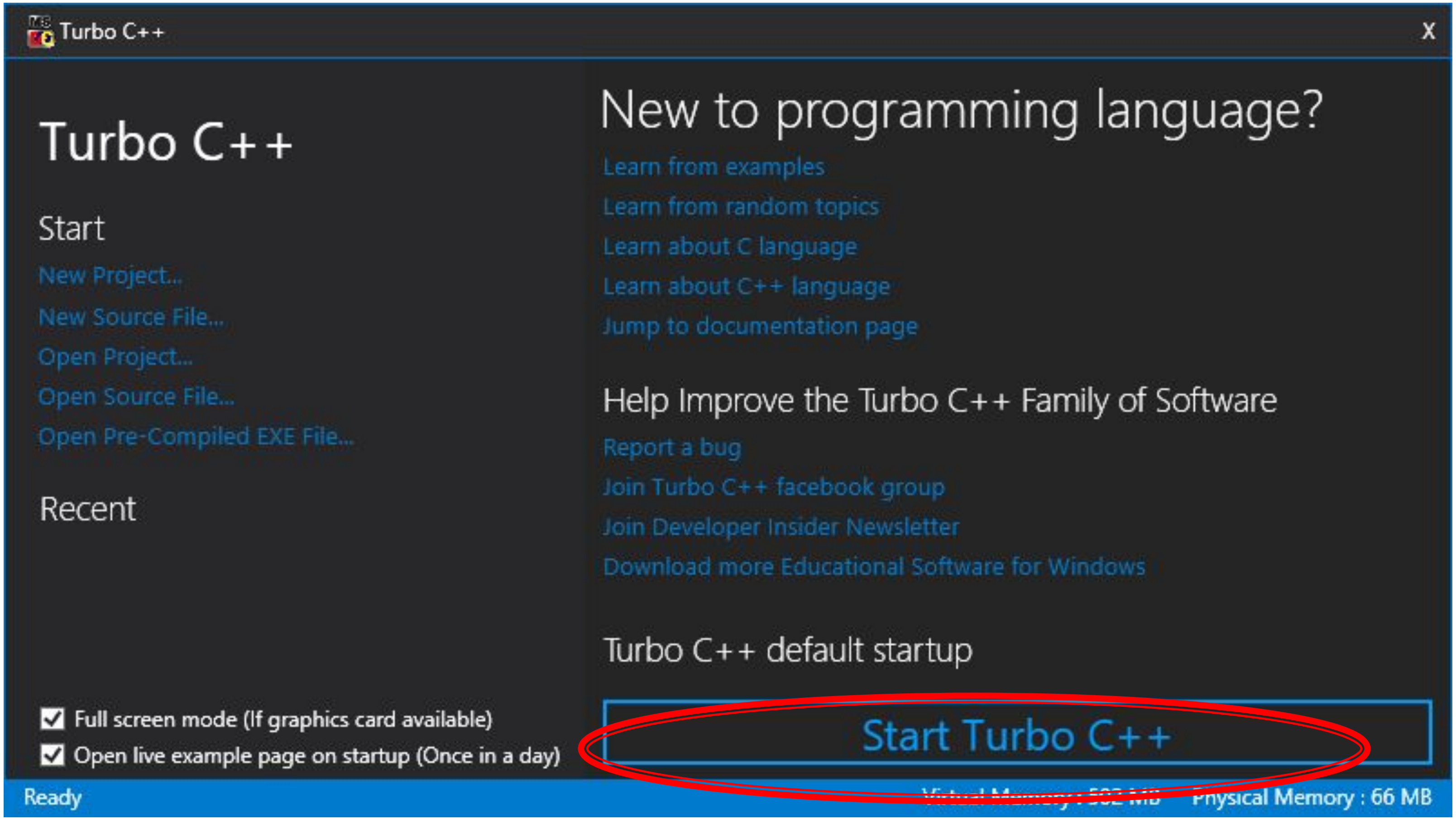


Turbo C++ 3.2 - InstallShield Wizard

Welcome to the InstallShield Wizard for Turbo C++ 3.2

The InstallShield(R) Wizard will allow you to modify, repair, or remove Turbo C++ 3.2. To continue, click Next.

Select accept radiobutton and click install□ Click Launch



Turbo C++
X
Turbo C++
Start
New Project...
New Source File...
Open Project...
Open Source File...
Open Pre-Compiled EXE File...
Recent
New to programming language?
Learn from examples
Learn from random topics
Learn about C language
Learn about C++ language
Jump to documentation page
Help Improve the Turbo C++ Family of Software
Report a bug
Join Turbo C++ facebook group
Join Developer Insider Newsletter
Download more Educational Software for Windows
Turbo C++ default startup
Start Turbo C++

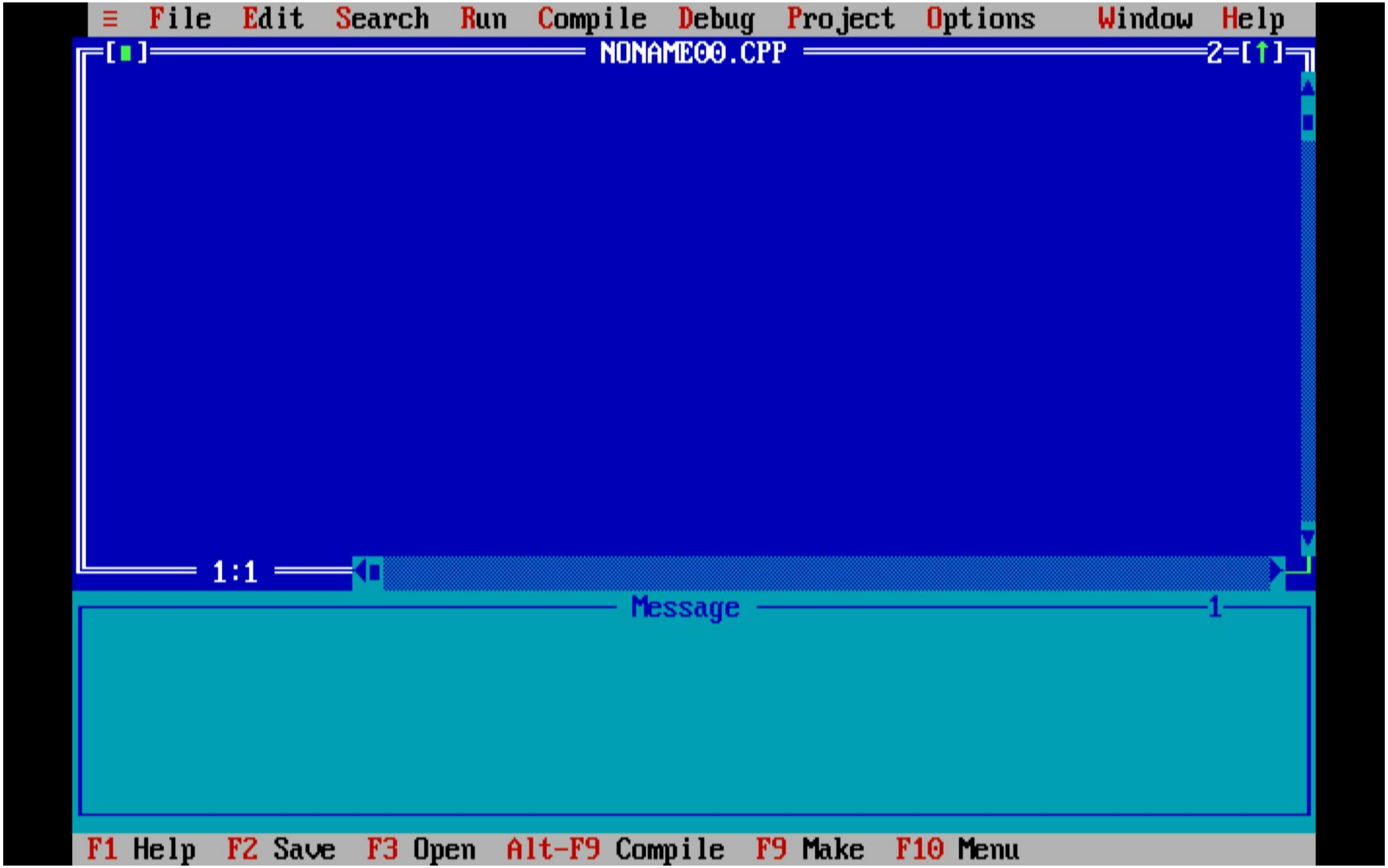
☑ Full screen mode (If graphics card available)

☑ Open live example page on startup (Once in a day)

Ready

Virtual Memory : 502 MB

Physical Memory : 66 MB


≡ File Edit Search Run Compile Debug Project Options Window Help
NONAME00.CPP
2
1:1
Message
1
F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

Tokens in C++

- **Each word or statement and punctuation** is referred to as a token in C++.
- Tokens are the **smallest building block or smallest unit** of a C++ program.

1. Keywords

- Keywords are **reserved words which convey special meaning** to compiler or computer program, and its **meaning cannot be changed**.
- The meaning and working of these keywords are already known to the compiler.

DATATYPES(kEYWORDS)

Keywords are the words that Convey Special meaning to the language compiler

The three basic data types are

- INTEGER

  These are whole numbers, both positive and negative

  int

- FLOATING POINT

  These are numbers which contain fractional parts, both positive and negative.

  float

- **CHARACTER**

  These are **single characters.**

  char

- **Double**

  These are numbers which contain decimal values.

  double

2. Comments in C++

- **Single line comment:**

Syntax:

```
// a comment
```

- **Multi-line comment**

```
/* a comment*/
```

2. VARIABLE(Identifiers)

- **Identifiers are names given to different entity** such as variables, structures, and functions. Also, identifier names should have to be **unique name**.
- Variables must be **declared before they can be used in a program**.
- **Used to Store values**

<u>Identifier naming conventions or rules</u>

1. Only alphabetic characters, digits and underscores are permitted.
2. First letter must be an alphabet or underscore (_).
3. Identifiers are case sensitive.
4. Reserved keywords can not be used as an identifier's name.

Valid declaration:-

```
int newvar;
int _newvar;
int new_var;
```

Invalid declaration:-

```
int 1newvar;
int float;
int new-var;
```

Local variables

Only exist inside the specific function.
They are **unknown** to other functions.
They are **recreated each time** a function is executed or called.

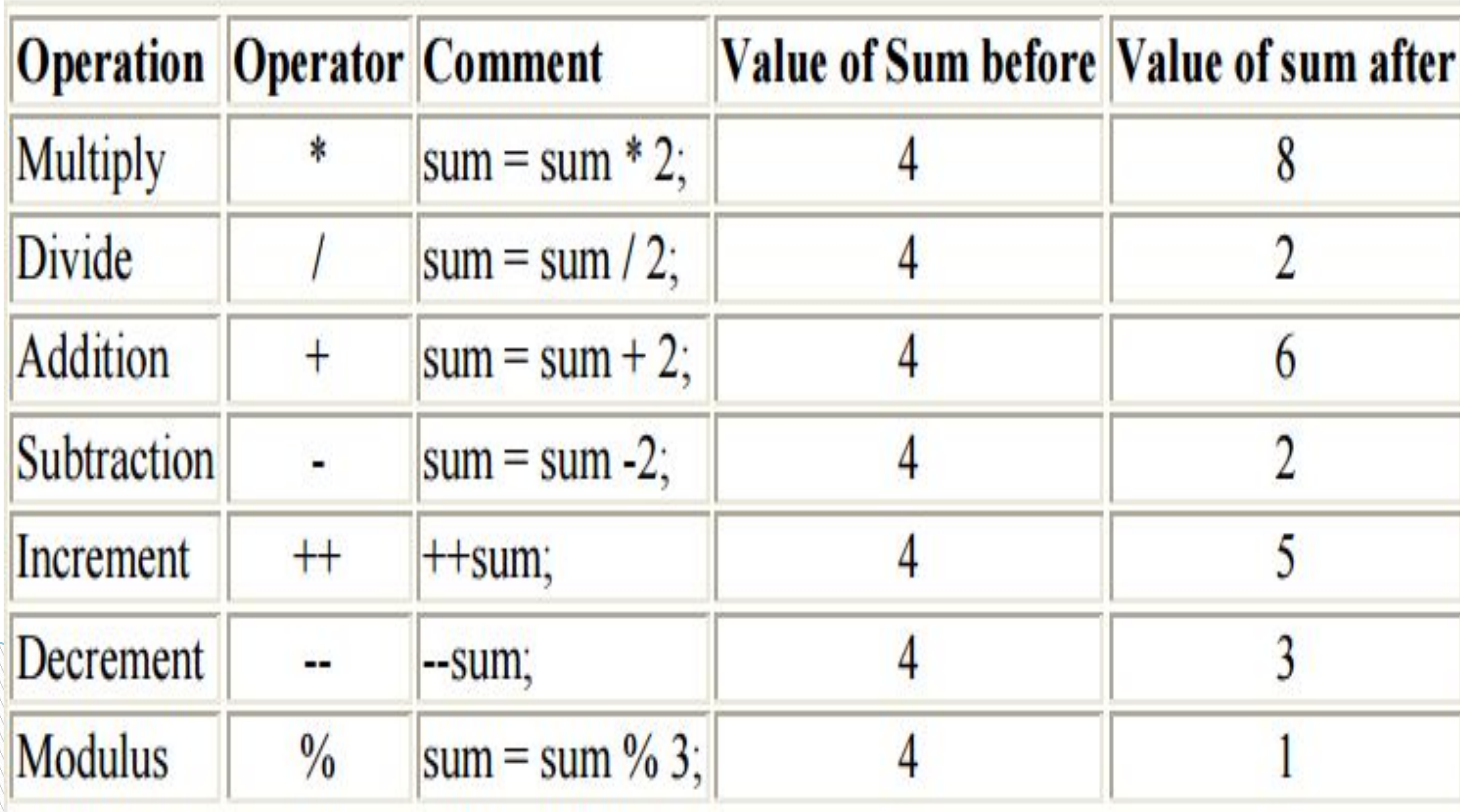
Global variables

These variables **can be accessed by any function** in the program.
They do not get recreated if the function is recalled.

3. OPERATORS AND EXPRESSIONS

a. ARITHMETIC OPERATORS:

The symbols of the arithmetic operators are:-



Operation	Operator	Comment	Value of Sum before	Value of sum after
Multiply	*	sum = sum * 2;	4	8
Divide	/	sum = sum / 2;	4	2
Addition	+	sum = sum + 2;	4	6
Subtraction	-	sum = sum -2;	4	2
Increment	++	++sum;	4	5
Decrement	--	--sum;	4	3
Modulus	%	sum = sum % 3;	4	1

b. THE RELATIONAL OPERATORS

These allow the comparison of two or more variables.

== equal to

!= not equal

< less than

<= less than or equal to

> greater than

>= greater than or equal to

c. THE I/O OPERATORS

1. Insertion(>>) :cin
2. Extraction(<<):cout

d. C++ Logical Operators

Logical operators are used to check whether an expression is **true** or **false**.
If the expression is **true**, it returns **1** whereas if the expression is **false**, it returns **0**.

Operator	Example	Meaning
&&	expression1 **&&** expression2	Logical AND. True only if all the operands are true.
||	expression1 **||** expression2	Logical OR. True if at least one of the operands is true.
!	**!**expression	Logical NOT. True only if the operand is false.

Classwork:

C++ Program to Print Number Entered by User
C++ Program to Add Two Numbers
C++ Program to Find Quotient and Remainder SHALMON
C++ Program to Swap Two Numbers

Homework:
C++ Program to calculate average marks of five subjects entered by user.
ANSH