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2.Define the following terms as used in programming:

Compiler:
A special program that translates a programming language source code into machine code ,bytecode or another programming language.

Source code:
Programming statements that are created by a programmer with a text editor or a visual programming tool and then saved in a file.

Object code:
The output ,a compiled file which is produced when the source code is compiled with a compiler.

Linkers:
Important utility program that takes the object files produced by the assembler and compiler and other code to join them into a single executable file.

3.Using an example; a program to add two numbers explain the compilation process of a program

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

    Int main() {

     Int num1 , num2 , sum;

      // taking input from the user printf("enter first number : ");

        scanf("%d" , &num1) ;

        printf (" enter second number : ");

        scanf("%d" , &num2);

        // Adding the numbers

        sum = num1 + num2;

        //displaying the result

        Printf("sum: %dn" , sum);
```

COMPILATION PROCESS

1.Preprocessing: The preprocessor(part of the compiler) handle directive like #include by including the contents of the specified header file (stdio .h in the case). It also processes any macro definition or conditional compilation statements.

2.compilation: The compiler translates the preprocessed C code into assembly code or an intermediate representation. It checks the syntax, semantic, and generate object code.

3.Assembly: The assembler convert the generated object code into machine code specific to the target architecture. This results in an object file (often with a .o or . obj extension)

4. Linking:The linker combine the object with any necessary library files (like the standard C library)

To crate an excutable file. It resolves references to functions or variables that are defined in other files.

5.Loading: if necessary ,the operating system loader loads the executable file into memory,making it ready for execution.

After these steps, you have a compiled and linked excutable program that can be run and add two numbers based on the provided C code.

4.Differences between compiler and interpreter

COMPILER	INTERPRETER
Takes a program as a whole,as input	Takes single lines of code.[instruction]
Generate intermediate object code	No intermediate object code is generated
Best suited for the production environment	Best suited for the software development environment
Speed is comparatively faster	Speed is slower
Compilation is done before execution	Compilation and execution takes place simultaneously.
Consumes less time and is more efficient	Consumes more time and it is less efficient
Displays errors after compilation all at the same time.	Displays errors of each line one by one

5. List all the main categories of operators available in c programming and specific operators in each category.

Operation Type	Operator's Type	Operators
Unary Operator	Increment/Decrement operators	++,--
Binary Operator	Arithmetic Operators	+,-,*,/,%,++,--
Binary Operator	Relational Operators	==,!=,<,>,<=,>=
Binary Operator	Logical Operators	&&,11,!
Binary Operator	Bitwise Operators	&,1,^,~,<<,>>
Binary Operator	Special Operators	,& size of ()
Binary Operator	Assignment Operators	=,+=,-=,*=,/=,%=
Ternary Operators	Ternary or Condition Operators	? :