Assignment 'I'

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1. What are computer programs & computer programming? Explain the steps that are required to build a computer program for solving a certain problem.

⇒ A computer program is a collection of instruction that can be executed by a computer to perform a specific task.

Alternatively, a computer program may be excuted with the aid of an interpreter.

Computer programming is the process that professionals use to write code that instructs how a computer application or software program performs.

To create a problem that solves a certain program are need to yallow the steps specified below

1) Identify the problem

This is the most crucial step in writting a program without a clean vesion of the problem we need to solve, building a program can become a very hard ~~program~~ process. Identifying the problem helps us yellow certain execution plan to effectively & efficiently build the required problem

Finding a suitable soln for the problem.

To find the soln for a new problem, we need to write algorithm & flowchart systematically. In a development work space for a program, Developers will usually make algorithm & flowcharts to find the logic to solve the problem before writing source code for it.

Writing the source code

After completing the algorithm & flowchart developer write the source code following it. Writing the source code includes various phase including beta versions to ultimately before a efficient executable program.

Testing the program.

This step include testing if the program work or not its accuracy & making improvement to make it faster & more optimized.

2. Define software. Explain its type

=> A software essentially a types of program which enable the users to perform some particular specific task or actually used to operate their computer.

Its types

a) System software

In case of a system software, it helps the user as well as the hardware to function & even interact with each other easily. Essentially, it is a software which is used to manage the behaviour of the computer hardware in order to offer basic functionalities which are needed by the user. eg:- i) Operating system ii) Device Driver iii) Firmware iv) utility.

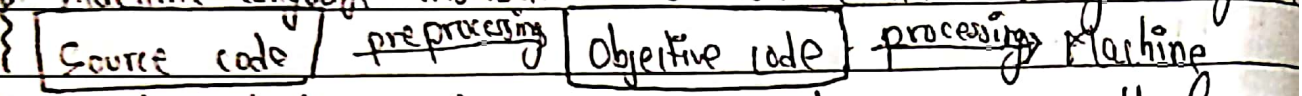
b) Application Software

They are also popularly known as end-user program or even productivity programs which assist the user in completing various task like conducting online research, making notes, designing graphic, carring out calculation, or even playing game.

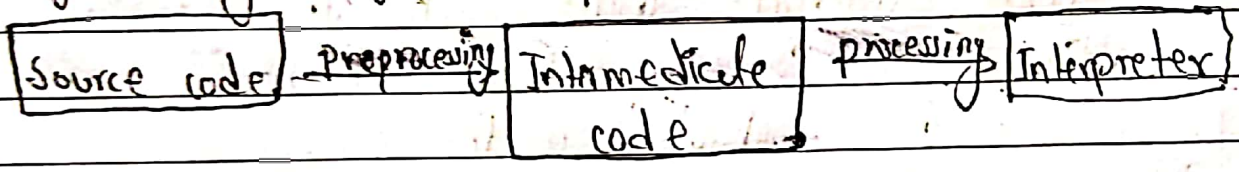
eg:- i) Word processor
ii) Data base software
iii) Multimedia Software
iv) Web browsers

3) What is mean by compilation & what is mean by interpretation & How do these two process differ?

=> Compilation is the computer software that translates source code written in high-level language into a set of machine-language instruction that can be understood by a digital computer / CPU.




=> An interpretation is a computer program that is used to directly execute program instruction written using one of the many high-level programming language.




| Interpretation | Compilation |
|---|---|
| → Translates program one statement at a time. | → Scans the entire program & translates it as a whole into machine code |
| → No object code is generated hence are memory efficient | → Generates object code which further required linking hence requires more memory. |
| → Programming language like Java Script, Python, Ruby use interpretation | → Programming language like C, C++, Java use compilation. |

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Explain in brief the steps involved during compilation process along with block diagram.

The compilation is a process of converting the source code into object code. It is done with the help of the compiler. The preprocessor take the source code as an input, & it removes all the comments from the source code. The preprocessor take the pre-processor directive & interpretes it. The following are the phases through which our program passes before transformed into an executable form :-

Preprocessor.

The source code is the code which is written in a text editor & the source code file is given as extension '.c'. This source code is first passed to the preprocessor, & then the preprocessor expands this code. After expanding the code, the expanded code is passed to the compiler.

Compiler

The code which is expanded by the preprocessor is passed to the compiler. The compiler converts this code into assembly code. Or we can say that the C compiler converts the pre-processed code into assembly code.

Assembler

The assembly code is converted into object code by using an assembler. The name of the object file generated by the assembler is the same as the source file. The extension of the object file in DOS is 'obj' & in UNIX, the extension is 'o'. If the name of the source file is 'hello.c' then the name of the object file would be 'hello.obj'

Linker.

Mainly, all the program written in C use library function. These library function are pre-compiled & the object code of these library files is stored with lib (or, a) extension. The main working of the linker is to combine the object code of library file with the object code of our programs. In DOS, the extension of the executable file is "exe." & in UNIX the executable file can be named as "a.out". For example, if we are using printf() function in a program, then the linker adds its associated code in output file

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5. Explain different generation of programming language?

=> The generation of programming language are:

(1) low-level language (LLL)

* A language that is machine-dependent & that offers few control instruction & data type. low level language can be divided into two type.

(a) Machine language (MCL)

The language that is called the language of CPU & written in binary code (0&1) is called Machine language. The program written in machine language does not need any translation.

(b) Assembly language

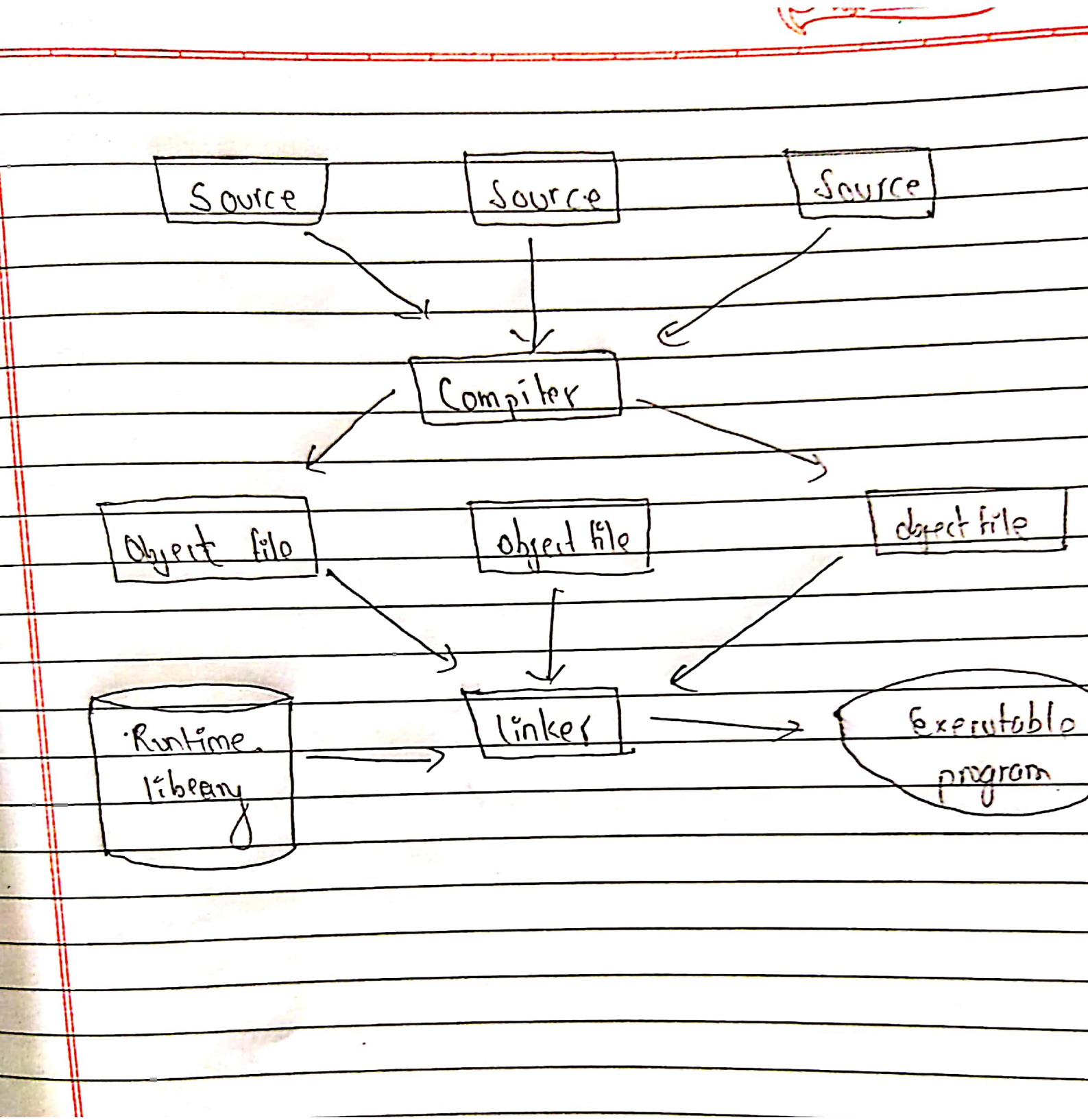
The language in which a program is written in shortcodes like ADD, MUL or SUB instead of writing instruction in a binary number (0&1) is called assembly language. It is easier to understand as compared to machine language.

(2) High-level language

The language which are quite similar to written English & are therefore very easier to use in compared to machine language & assembly language are called High-level language.

(a) Procedural oriented language

Procedural Oriented language are the general purpose programming language. It is also know as the 3rd generation languages. These are designed to express the logic & the procedure of a program. eg: Pascal, C



(b) Problem-oriented language.

These language are non-procedural language which allows the users to specify what the output should be. Problem-oriented language are one step ahead of 3GL & they dont describe all the details of how the data are manipulated to produce the result.
eg:- C#, PHP, etc.

(c) Natural language.

Also know as 5th generation language these are still in the developing stage. In completion, we could write statement that would look like normal sentence. Natural language such as English, Nepali & other language would be used in the computer making them more intelligent & user-friendly.