

MODULE 1: SOFTWARE AND HARDWARE

Software Definition: A set of instructions given to the computer. Characteristics: Intangible (cannot be touched or felt). Developed by writing instructions in a programming language. Controls the operations of the computer. Can be reinstalled from a backup copy if damaged or corrupted. Examples: Antivirus, Microsoft Office Tools.

Hardware Definition: Physical parts of a computer. Characteristics: Tangible (can be touched and felt). Constructed using physical components. Operates under the control of software. Can be replaced if damaged. Examples: Keyboard, Monitor, Mouse.

Software is collection of instructions that tells the computer what to do.

Hardware is physical elements of a computer.

Types of Software

System Software Definition: A collection of programs that support the operation of a computer. Functions: Helps run computer hardware and the computer system. Manages the operation of computer hardware. Types: Operating System, Language Translators (Compiler, Assembler, Interpreter, Macro Processor), Loader, Linker, Debugger, Text Editor

Operating System Definition: Acts as an interface between the user and the system. Features: Provides a user-friendly interface. Functions: Process Management, Memory Management, Resource Management, I/O Operations, Data Management, Provides security for jobs

Language Translators Definition: Programs that convert code from one programming language to another (for example, from source code to object code). Types:

Compilers Translates a high-level language program into machine language as a whole. Used by languages such as C and C++.

Linker Definition: A process that collects and combines various pieces of code and data into a single executable file. Types:

Linking Loader Performs linking and relocation directly into main memory for execution.

Linkage Editor Produces a linked version of the program (load module or executable image) for later execution.

Dynamic Linker Postpones linking until execution time (dynamic loading).

Loader Definition: A utility of the operating system that copies a program from a storage device to the computer's main memory. Features: Replaces virtual addresses with real addresses. Invisible to the user.

Debugger Definition: An interactive system that helps programmers test and debug programs. Functions: Locates bugs or faults in the program. Assists in fixing errors. Determines the exact nature and location of errors.

Device Driver Definition: A software module that manages communication and control of specific I/O devices. Function: Converts logical requests from the user into specific commands for the device.

Macro Processor Definition: A program that processes macros, which are code fragments defined once and reused by calling them. Features: Defined using the `#define` directive (for example, `#define BUFFER_SIZE 1020`). Often embedded in assemblers and compilers.

Text Editors Definition: Programs that allow users to create and edit source programs as text in main memory. Functions: Creation, editing, deletion, and updating of documents or files.