

A computer system is a collection of hardware (physical components) and software (programs).

- Computer Hardware
 - See file: “Basic Makeup of a Computer System”
- Software
 - operating system -
 - a set of programs that allow you to interface with the hardware.
 - responsible for processing user requests or user programs
 - e.g. MS/DOS, UNIX
 - applications programs - e.g. spreadsheets, word processors, data base management systems

Algorithm

- A step by step ordered procedure that solves a problem in a finite number of precise steps
- Examples:
 - top-down design (hierarchy chart)
 - start with the overall task, then break down into progressively smaller tasks
 - divide and conquer
 - natural language (English-like statements)
 - flowchart - a diagram that shows the logical flow of a program
 - pseudocode - a cross between natural language and a programming language
 - control structures (decisions, loops)
 - style: indentation
 - programming languages
 - machine language: binary (1's and 0's), bits
 - low level language: Assembly Language
 - closer to the numeric machine language of the computer than to natural language
 - disadvantages:
 - machine dependent
 - not close enough to natural language to be easily learned and understood
 - require technical background (understanding of computer architecture)
 - high level languages
 - BASIC - met the need for simplicity; often used in an interactive environment
 - FORTRAN - designed in the late 1950s to meet the needs of the scientific and engineering communities
 - COBOL - designed for business applications
 - Pascal - introduced the concept of structured programming & special data types; a teaching language
 - C - a structured language developed at Bell Laboratories that allows low-level programming while using a high-level style language
 - C++ - a spin off of the C language also developed at Bell Labs that offers object-oriented features not found in C; portable
 - Java - object-oriented language developed at Sun Microsystems used to develop programs that run over the internet in a Web browser
 - Visual Basic - a software development environment by Microsoft that allows programmers to create Windows-based applications

- language processors:
 - assembler - software that translates assembly language programs to machine language instructions to be executed (later) on a computer
 - interpreter - software that translates one statement at a time of a program into machine language and executes the statement immediately before going on to process the next statement
 - compiler - software that translates a program written in a high-level language into binary machine language instructions so that the program can be executed (later) on a computer.