

What is a computer?

A computer is a device capable of performing computations and making logical decisions at speeds millions and even billions of times faster than human beings can.

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Programs and Programmers

Computers process data under the control of sets of instructions called **computer programs.**

These computer programs guide the computer through orderly sets of actions specified by people called **computer programmers.**

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What is programming?

Computer programming is the process of planning a sequence of steps for a computer to follow.

It involves:

- ☞ Problem solving phase.
- ☞ Implementation phase.
- ☞ Maintenance phase.

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Three types of computer languages

- ☞ Machine Language
- ☞ Assembly Language
- ☞ High-Level Languages

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Introduction to Programming

Before writing a program

- Have a thorough understanding of the problem
- Carefully plan your approach for solving it

While writing a program

- Know what “building blocks” are available
- Use good programming principles

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Six Steps to Good Programming Habits

1. Analyze the Problem
 1. Problem statement
 2. Input/Output description
2. Develop an Algorithm
 1. Pseudocode
 2. Hand example
3. Document the Program
4. Write Code for the Program
5. Run the Program
6. Test the Results

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Algorithms

Computing problems

- Solved by executing a series of actions in a specific order

Algorithm a procedure determining

- Actions to be executed
- Order to be executed
- Example: recipe

Program control

- Specifies the order in which statements are executed

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Pseudocode

Pseudocode

- Artificial, informal language used to develop algorithms
- Similar to everyday English

Not executed on computers

- Used to think out program before coding
 - Easy to convert into C++ program
- Only executable statements
 - No need to declare variables

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Program Development

📄 Writing a program is like writing an essay:

- An overall theme is envisioned
- An outline of major ideas is developed
- Each major idea is subdivided into several parts
- Each part is developed using individual sentences

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Problem Solving Methodology

1. Analyze the Problem
 1. Problem statement
 2. Input/Output description
2. Develop an Algorithm
 1. Pseudocode / flowchart
 2. Hand example
 3. Test the algorithm
3. Document the Program
4. Write the Code for the Program (based on your algorithm)
5. Run the Program and test the results

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Flowchart Symbols



Flow Line



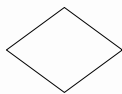
Terminal



Input / Output



Processing



Decision

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