

CHAPTER 8

COMPUTER PROGRAM

Introduction

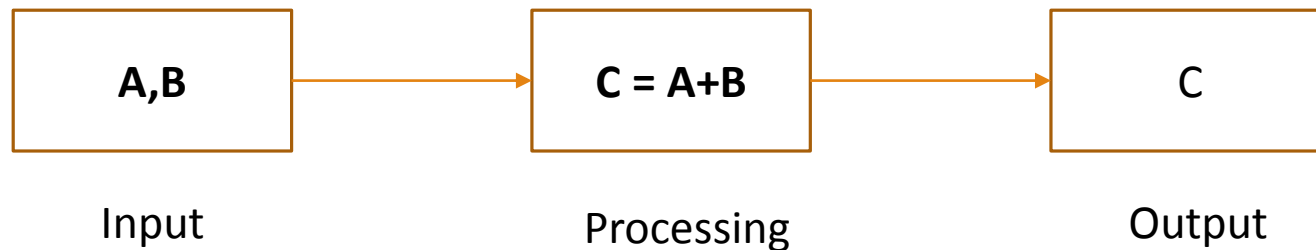
- Computer can perform a variety of tasks like receiving data, processing it and producing useful results.
- Computer need to be instructed to perform even a simple task like addition of two numbers
- Computer work on a set of instructions called computer program

Introduction

- **Computer program:** specifies a way to carry out a task
- **Computer Programmer:** responsible for designing, writing, and modifying computer programs
 1. System Programmer: write programs, which provides interface and functionality to the hardware programs
 2. Application Programmer: writes programs to fulfil a specific task such as payroll system, inventory control

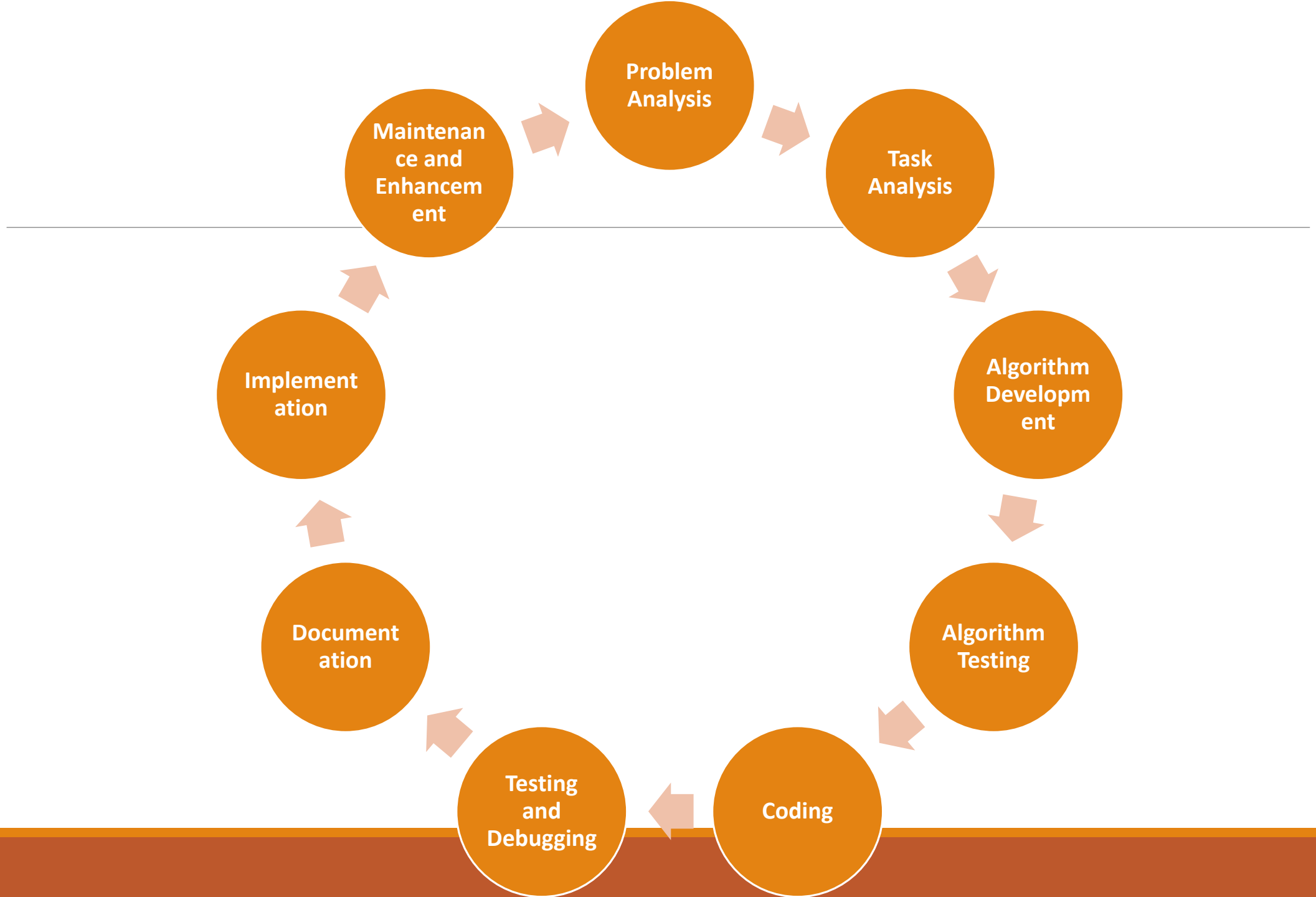
Developing a Program

- Program consists of a series of instructions that a computer processes to perform the required operation
- Programmer should specifies:
 1. The instruction to be performed
 2. The order in which those instructions are to be performed
 3. The data required to perform those instructions



Program Development Cycle

- Before writing a program (coding), the programmer has to determine the problem that needs to be solved
- One common approach to problem solving is to use program development cycle



Program Development Cycle

- **Problem Analysis:**
 - Problem is analyzed precisely and completely
 - Developer knows about the scope within the problem needs to developed
- **Task Analysis:**
 - Developer needs to develop various solutions to solve the given problem
 - From numerous solutions, optimum solution is chosen

Program Development Cycle

- **Algorithm Development:**

- An algorithm (ex. flowchart) is developed to depict the basic logic of the selected solution
- Algorithm depicts the solution in logical steps

- **Algorithm Testing:**

- Before converting the algorithm into actual code, it should be checked for accuracy
- Test data need to be 'walk through' each step in the algorithm
 - That verify that the instructions described in the algorithm actually perform the required functions or not
 - Identify major logical errors, if any
 - Ensure that algorithm work for both normal and unusual data

Program Development Cycle

- **Coding:**

- Program takes place in the chosen programming language

- **Testing and Debugging:**

- Find logical errors (semantic errors) or due to the incorrect use of programming language (syntax error)
- Results obtained are compared with results calculated manually from the test data
- Depend upon the complexity, several rounds of testing may be required

Program Development Cycle

- **Documentation:**
 - Once the program is free from the errors, it is the duty of programmer developer to ensure that program is supported by suitable documentation
 - Documentation enables the user to operate the program correctly
- **Implementation:**
 - The program is installed on the end user's machine
 - The implementation can be viewed as the final testing because only after using the program, the user can point out the drawbacks and report them to developers
- **Maintenance and Enhancement:**
 - Program should properly maintained by taking care of the changing requirements of its users and system