

Implementation and maintenance?: the act of using alternative solution or developed solution and providing support to a system

Design: the act of developing alternative solution to a problem

Analysis is: What is programming analysis?

In computer science, program analysis is **the process of automatically analyzing the behavior of computer programs regarding a property** such as correctness, robustness, safety and liveness. Program analysis focuses on two major areas: **program optimization and program correctness**

Low-level languages are languages that sit close to the computer's instruction set. An instruction set is the set of instructions that the processor understands. Two types of low-level language are: **machine code**

high-level language: a computer programming language that resembles natural language or mathematical notation and is designed to reflect the requirements of a problem

Python programming Language: is a highlevel programming language that is easy to learn and code with, it is used for variety of things such as GUI development and advanced system programming

Key notes about python

1. it uses lines to complete command
2. Python relies on indentation
3. Comment start with a # symbol
4. Python auto select data type based on value assigned to a variable.

SYNTAX ERRO: Syntax error is an error in the syntax of a sequence of characters or tokens that is intended to be written in compile time

Pseudocode: it is the representation of an algorithm

Problem Solving

Thus, **problem solving** is the process of defining a problem, determining the cause of the problem, identifying, prioritizing and providing alternative solution.

Steps Involved in problem Solving

Step 1: Identifying and define the problem

- State the problem as clearly as possible

Step 2: Generate Possible solutions

- List all possible solutions, don't worry about the quality of solutions at this stage

Step 3: Evaluate alternatives

- Removing less desirable or unreasonable solutions
- Evaluate the remaining solutions in terms of their advantages

Step 4: Decide on Solution:

- Specify how the solution will be implemented

Step 5: Implement the solution

Control statement: Control statement enables us to specify the flow of the program control i.e the order in which the instructions in a program must be executed

Types of control statement

1. Conditional/selective statement: Allows you to control the execution flow of the program depending on the condition
2. Iterations/loop statement: cause statement to be executed zero or more times, subject to some loop termination criteria
3. Jump statement: causes an unconditional jump to another statement elsewhere in the code.

CRITERIAS FOR MEASURING THE EFFICIENCY OF AN ALGORITHM

1. Time complexity: is a function describing the amount of time an algorithm takes in terms of the amount of input to the algorithm
2. Space complexity: is a function describing the amount memory (space) an algorithm takes in terms of the amount of input to the algorithm

Characteristics of an algorithm:

- 1). **Input:** An algorithm must have either 0 or more inputs.
- 2). **Output:** An algorithm should have 1 or more desired output.
- 3). **Unambiguous:** Every Algorithm should be unambiguous and clear. It means that it's every step, and input/output should be clear and must have only one meaning.
- 4). **Feasibility:** Algorithm should be feasible with the available resource.
- 5). **Finiteness:** Algorithm should be terminated after a finite number of steps.
- 6). **Independent:** Algorithm should have a step-by-step direction of each level, which is independent of programming language.