SNS COLLEGE OF TECHNOLOGY

Coimbatore-36.

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COURSE NAME : 19CST101 – PROGRAMMING FOR PROBLEM SOLVING

I YEAR/ I SEMESTER

UNIT – I INTRODUCTION TO PROBLEM SOLVING TECHNIQUES

Topic: Notation (Programming Language & Categories of programming languages)

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Programming Language

A **programming language** is a set of symbols and rules for instructing a computer to perform specific tasks. The programmers have to follow all the specified rules before writing program using programming language. The user has to communicate with the computer using language which it can understand.

Types of programming language

1. Machine language
2. Assembly language
3. High level language

Programming Language

Machine language:

- The computer can understand only machine language which uses 0’s and 1’s. In machine language the different instructions are formed by taking different combinations of 0’s and 1’s.

Advantages:

1. Translation free
2. High speed

Disadvantage:

1. Hard to find errors
2. Time consuming
3. Machine dependent

Programming Language

Assembly language:

- An assembly language is developed which is logically equivalent to machine language but it is easier for people to read, write and understand.
- Assembly language is symbolic representation of machine language that uses symbolic notation to represent machine language instructions.
- Its also called low level language because it closely related to the machines.

Assembler:

- Assembler is the program which translates assembly language instruction in to a machine language.

Advantage:

1. Easy to understand and use.
2. It is easy to locate and correct errors.

Disadvantage:

1. Machine dependent
2. Hard to learn
3. Less efficient

Programming Language

High level language

- High level language contains English words and symbols. The specified rules are to be followed while writing program in high level language. The interpreter or compilers are used for converting these programs in to machine readable form.

Translating high level language to machine language

Compiler:

- Compiler reads the whole program written in high level language and translates it to machine language.
- If any error is found it display error message on the screen.

Interpreter

- Interpreter translates the high level language program in line by line manner.
- The interpreter translates a high level language statement in a source program to a machine code and executes it immediately before translating the next statement.
- When an error is found the execution of the program is halted and error message is displayed on the screen.

Programming Language

Advantages

1. Readability
2. Machine independent
3. Easy debugging

Disadvantages

1. **Less efficient -** The translation process increases the execution time of the program. Programs in high level language require more memory and take more execution time to execute.

Categories Programming Language

Programming language are divided into following categories:

1. Interpreted programming languages
2. Functional programming languages
3. Compiled programming languages
4. Procedural programming languages
5. Scripting programming language
6. Markup programming language
7. Concurrent programming language
8. Object oriented programming language

Categories Programming Language

Interpreted programming languages

- An interpreted language is a programming language and it executes instructions directly, without previously compiling a program into machine language instructions.
- The interpreter executes the program directly translating each statement into a sequence of one or more subroutines already compiled into machine code.

Examples:

1. Pascal
2. Python

Object oriented programming language:

- Object oriented programming is a programming paradigm based on the concept of objects which may contain data in the form of procedures often known as methods.

Examples:

1. Lava
2. Moto

Categories Programming Language

Functional programming language:

- Functional programming language defines every computation as a mathematical evaluation. They focus on the programming languages are bound to mathematical calculations.

Examples:

1. Clean
2. Haskell

Compiled Programming language:

- A compiled programming is a programming language whose implementation are typically compilers and not interpreters.
- It will produce a machine code from source code.

Examples:

1. C, C++, JAVA, C#

Categories Programming Language

Procedural programming language:

- Procedural (imperative) programming implies specifying the steps that the programs should take to reach to an intended state.
- Procedures help in the reuse of code.
- Procedural programming makes the programs structured and easily traceable for program flow.

Examples:

1. Hyper talk
2. MATLAB

Scripting language:

- Scripting language are programming languages that control an application.
- Scripts can execute independent of any other application.
- control and are used to automate frequently executed tasks like communicating with external program.

Examples:

1. VB script

Categories Programming Language

Markup languages:

- A markup language is an artificial language that uses annotations to text that define hoe the text is to be displayed.

Examples:

1. HTML
2. XML

Concurrent programming language:

- Concurrent programming is a computer programming technique that provides for the execution of operation concurrently, either with in a single computer or across a number of systems.

Examples:

1. Joule
2. Limbo

Thank
you