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Tutorial 01 – CS102.3

Question 1

In short, programming languages are essential for interacting with computers, creating software, automating tasks, and solving problems.

Question 2

Source code vs Machine code:

Source code refers to the human-readable instructions written in a programming language. It is written by developers and can be easily modified and understood.

Machine code, on the other hand, consists of binary instructions directly executable by the computer's hardware. It is not easily readable or modifiable by humans.

High-level language vs Low-level language:

High-level languages are designed to be more abstract and user-friendly, providing a higher level of abstraction from the hardware. They use English-like statements and are easier to read and write.

Low-level languages are closer to the hardware and provide more direct control over the computer's resources. They are less abstract and often require more detailed instructions.

Compiler vs Interpreter:

A compiler translates the entire source code into machine code before execution. The resulting executable file can be executed directly by the computer without the need for the original source code or the compiler itself.

An interpreter, on the other hand, translates and executes the source code line by line at runtime. It does not produce a standalone executable and requires the interpreter to be present during execution.

Structured language vs Object-oriented language:

Structured languages emphasize organizing code into reusable and modular structures, using control structures like loops and conditionals. Examples include C and Pascal.

Object-oriented languages focus on organizing code around objects that encapsulate data and behavior. They support concepts like inheritance and polymorphism. Examples include Java and C++.

C vs C++:

C is a procedural programming language known for its low-level capabilities and efficient execution. It is widely used for system programming and embedded systems.

C++ is an extension of the C language with added features such as classes, objects, and polymorphism, making it an object-oriented language. It provides better support for software development and allows for both procedural and object-oriented programming.

C++ vs Java:

C++ is a statically typed language that supports both procedural and object-oriented programming paradigms. It offers more direct control over hardware and memory management. It is commonly used for system-level programming and game development.

Java is a platform-independent language that is executed in a virtual machine (JVM). It is also object-oriented and focuses on simplicity, portability, and security. Java is commonly used for enterprise-level applications and Android development.

Syntax error vs Logical error:

A syntax error occurs when the code violates the rules and structure of the programming language. It prevents the code from being compiled or executed.

A logical error, also known as a runtime error, occurs when the code is syntactically correct but produces unexpected or incorrect results. It may cause the program to behave incorrectly or crash during execution.