



Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

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Question: 01

- a. Write down the differences between Language and Framework with examples.**

Answer:

Language and framework are two terms that are often used in the context of software development. However, they have different meanings and implications.

Programming Language

A programming language is the foundational building block of a program. It is a formal language comprising a set of instructions that a computer can comprehend and execute. It establishes the fundamental syntax, grammar, and semantics for constructing software applications.

Key Characteristics:

- Emphasizes precise syntax and grammar rules for code construction.
- Offers complete control over the program's execution flow.
- Possesses high flexibility for diverse tasks.
- Typically involves a steeper learning curve.

Examples:

- Python
- JavaScript
- Java
- C++
- C#
- Ruby
- Go
- Swift

Frameworks

A framework is a pre-built software structure that provides a foundation and guidelines for developing applications. It offers reusable code, libraries, and tools to expedite and simplify the development process. It is called the pre-engineered structures for streamlined development.

Key Characteristics:

- Enforces conventions and best practices for code organization.
- Accelerates development by providing pre-built components.
- Promotes consistency and maintainability within projects.
- May restrict flexibility to some degree.

Examples:

- Web frameworks: React, Angular, Vue.js, Django, Ruby on Rails, Spring
- Mobile frameworks: Flutter, React Native, Ionic
- Game development frameworks: Unity, Unreal Engine

Key Differences:

Feature	Programming Language	Framework
Focus	Syntax, grammar, semantics	Structure, patterns, best practices
Control	Complete control over code	Guided by framework's structure and conventions
Flexibility	Highly flexible	Less flexible, but more efficient for specific tasks
Learning curve	Steeper learning curve	Easier to learn with existing language knowledge
Reinventing the wheel	Often requires writing code from scratch	Focus on application logic, not low-level details

- b. Explain the statement “The term native language for a specific operating system (OS) refers to the language in which the OS was originally developed or designed to function.”**

Answer:

The term native language for a specific operating system (OS) refers to the language in which the OS was originally developed or designed to function. For example, the native language of Windows OS is C, because it was written in this programming language. The native language of an OS determines its features, performance, compatibility, and security. An OS can also support other languages that are not native, such as Python or Java, but these languages may require additional software or hardware to run on the OS.

Native language:

The native language refers to the programming language used to write the core code of the operating system.

A more accurate understanding of "native language" in the context of an OS emphasizes several aspects:

- **Development Languages:** The primary programming languages used to create the core components of the OS.
- **Internal Composition:** The diverse language landscape within the OS, where different components might utilize different languages for optimized performance and maintainability.
- **Execution Mechanism:** The distinction between compiled languages directly understood by the hardware and interpreted languages requiring translation within the OS.

Examples:

- **Windows:** C and C++ are the native languages.
- **Linux:** C and Python is the primary language, with some assembly language usage and some shell scripting language like bash for conveniency.
- **macOS:** C, C++, and Objective-C are used.