Scripting Languages

- A scripting language, script language, or extension language is a programming language that allows control of one or more applications.

- "Scripts" are distinct from the core code of the application, as they are usually written in a different language and are often created or at least modified by the end-user.

- Scripts are often interpreted from source code or bytecode, whereas the application is typically first compiled to native machine code.

- Early script languages were often called batch languages or job control languages

Scripting Languages

- Job control languages and shells
  - Relates to starting and controlling the behavior of system programs. Many of these languages' interpreters double as command-line interpreters.
- GUI scripting
  - A specialized kind of scripting language for controlling a computer. Interact with the graphics that a system generates.
    - They do this by simulating the actions of a human user.
  - Such languages are also called "macros" when control is through simulated key presses or mouse clicks.

Scripting Languages

- Application-specific languages

  - Languages are designed for a single application; and, while they may superficially resemble a specific general-purpose language, they have custom features that distinguish them.

  - Can be viewed as a domain-specific programming language specialized to a single application.

- Web browsers (Client-side scripting)

  - Scripts can be run by web browsers to change the appearance or behaviour of a web page.

Scripting Languages

- Text processing languages

  - The processing of text-based records is one of the oldest uses of scripting languages.

- General-purpose dynamic languages

  - Some languages, such as Perl, began as scripting languages but were developed into programming languages suitable for broader purposes.

- Extension/embeddable languages

  - Designed for the purpose of replacing application-specific scripting languages by being embeddable in application programs. AILRSC. 2012.

Shell Scripts

- A shell script is a script written for the shell, or command line interpreter, of an operating system.

- It is often considered a simple domain-specific programming language.

  - A domain-specific language (DSL) is a programming language or specification language dedicated to a particular problem domain, a particular problem representation technique, and/or a particular solution technique.

- Typical operations performed by shell scripts include file manipulation, program execution, and printing text.

Awk

- The AWK utility is a data extraction and reporting tool that uses a data-driven scripting language consisting of a set of actions to be taken against textual data (either in files or data streams) for the purpose of producing formatted reports.

- The language used by awk extensively uses the string datatype, associative arrays (that is, arrays indexed by key strings), and regular expressions.

Perl

- Perl is a high-level, general-purpose, interpreted, dynamic programming language. Perl was originally developed by Larry Wall in 1987 as a general-purpose Unix scripting language to make report processing easier.

- Since then, it has undergone many changes and revisions and become widely popular amongst programmers.

Perl

- Perl borrows features from other programming languages including C, shell scripting (sh), AWK, and sed.

- The language provides powerful text processing facilities without the arbitrary data length limits of many contemporary Unix tools, facilitating easy manipulation of text files.

- Perl gained widespread popularity in the late 1990s as a CGI scripting language, in part due to its parsing abilities.

Perl

- In addition to CGI, Perl is used for graphics programming, system administration, network programming, finance, bioinformatics, and other applications.

- Perl is nicknamed "the Swiss Army chainsaw of programming languages" due to its flexibility and power.

- It is also referred to as the "duct tape that holds the Internet together", in reference to its ubiquity and perceived inelegance.

Python

- Python is a general-purpose, high-level programming language whose design philosophy emphasizes code readability.

- Python's use of indentation for block delimiters is unique among popular programming languages.

- Python supports multiple programming paradigms, primarily but not limited to object-oriented, imperative and, to a lesser extent, functional programming styles.

Python

- Python is often used as a scripting language, but is also used in a wide range of non-scripting contexts.

- Python is often used as a scripting language for web applications, e.g. via mod_wsgi for the Apache web server.

  - With Web Server Gateway Interface, a standard API has been developed to facilitate these applications.

- Python has been successfully embedded in a number of software products as a scripting language.

Python

- Libraries like NumPy, SciPy and Matplotlib allow Python to be used effectively in scientific computing.

- Has many implementations:

    - The mainstream Python implementation, known as CPython, is written in C

    - Jython compiles the Python program into Java byte code.

    - IronPython runs Python programs on the .NET Common Language Runtime.

Ruby

- Ruby is a dynamic, reflective, general-purpose object-oriented programming language that combines syntax inspired by Perl with Smalltalk-like features.

- Ruby supports multiple programming paradigms, including functional, object oriented, imperative and reflective.

- It also has a dynamic type system and automatic memory management.

- Ruby on Rails, often shortened to Rails or RoR, is an open source web application framework for the Ruby programming language.