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Explain origin and characteristics of scripting languages.

Scripting languages are types of programming languages that are designed to automate tasks within a software system. They are typically easier to learn and use than traditional programming languages and allow programmers to quickly write small programs or scripts that can be executed without the need of lengthy compilation or linking processes.

→ mostly interpreted

The term scripting language was first used in 1960s when language like Perl, Python etc began to gain popularity. These languages were designed to be interpreted rather than compiled meaning that the code could be executed directly without being transformed into machine code before hand.

Characteristics:

1) It is open source, which means a user can have full control to view and edit it

2) It is easy to learn and work with.

3) Comparatively faster to develop than an actual program

4) It has limited number of data structure which makes it easy to write and edit.

5) The language is beneficial to bring interactivity in web pages

6) It is used to create plug-ins and extension

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web scripting → creating and embedding scripts in web page
- client side web scripting
- server side web scripting

The process of creating and embedding scripts in web page is known as web scripting. Two types - server-side & client-side

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What do you mean by script and programs.
A script is a set of instructions written in a scripting language that can be executed by an interpreter. Scripts are often used to automate or to add functionality to a larger software system. They are typically smaller in size than traditional programs and are often used for quick and simple tasks.

Program is a set of instructions written in a programming language that can be compiled into an executable file. Programs are often larger and more complex than scripts and are designed to perform more advanced tools.

What are the types of scripting language.
Two types
1) Server-side SL: A web server is where server-side scripting languages are executed. When a client submits an HTTP request, the server responds by delivering content. Server-side scripts are not visible to general public. Eg PHP, Java, Ruby, Perl, Python.

2) Client-side SL: This executes on client's end - in their web browser. Client side scripts are visible to general public. It can reduce server demand and allow web pages to load quickly. eg HTML, CSS, Javascript

What are the advantages and disadvantages of SL
Advantages
1) Easy to learn and write programs
2) allows to quickly write small code scripts that can be executed without the need of lengthy compilation

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3) Highly flexible
4) Scripts are generally small :. it is easy to modify
5) Simple to switch b/w operating systems.

Disadvantages
1) Slower performance than programs
2) Security risks due to interpretation
3) Limited functionality
4) Installing an interpretation program might be difficult

Q What are the uses of scripting language.
1) Automation: It is used to automate repetitive and routine tasks, such as system administration, data processing and testing.

2) Web development: Scripting languages like JavaScript, PHP etc are commonly used for web development including front-end and back-end web development.

3) Rapid prototyping: It is used for rapid prototyping of applications as it allows developers to quickly test and modify code without the need of lengthy compilation

4) Gaming: It is used in gaming industry for creating game scripts, designing game levels, and programming game mechanics.

5) Data extraction: Programmers uses this to pull data from data sets such as data analysis, research and statistics

6) System administration: When administrators wants to generate and pull data, guide users queries and improve systems they use scripting language.

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Scripting language

- Based on interpreter
- easy to write and use
- It has no file type
- It needs a host
- Requires low maintenance
- does not support data types, graphic design
- does not require to compile a file
- runs inside a program and is dependent on it

Programming Language

- based on compiler
- difficult to write and use
- It contains .exe file type
- does not need a host
- requires high maintenance
- support data types, graphic design
- requires to compile the file first
- independent of parent program

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Python: A popular and versatile language used for web development, data analysis, machine learning, and scientific computing.

JavaScript: A scripting language used primarily for web development, including front-end development using frameworks like React and Vue.js.

Bash: A shell scripting language used primarily for system administration tasks on Unix-based systems.

Ruby: A dynamic, object-oriented language used primarily for web development, including the Ruby on Rails framework.

PHP: A server-side scripting language used primarily for web development, often in combination with popular content management systems like WordPress and Drupal.

Perl: A flexible, general-purpose language used primarily for web development, system administration, and text processing.

PowerShell: A shell scripting language used primarily for system administration tasks on Windows-based systems.

Lua: A lightweight, fast language often used for game development, embedded systems, and scripting in other applications.

Tcl: A simple, flexible language used for a wide range of applications, including system administration, network programming, and scientific computing.

R: A language used primarily for data analysis, machine learning, and scientific computing, often in combination with popular frameworks like TensorFlow and Keras

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