

Python Assignment

Module-1 (SDLC)

➤ QUESTION:1 What is Software?

Software is a set of instructions, data or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer. Software is a generic term used to refer to applications, scripts and programs that run on a device. It can be thought of as the variable part of a computer, while hardware is the invariable part.

The two main categories of software are application software and system software. An application is software that fulfills a specific need or performs tasks. System software is designed to run a computer's hardware and provides a platform for applications to run on top of.

Other types of software include programming software, which provides the programming tools software developers need; middleware, which sits between system software and applications; and driver software, which operates computer devices and peripherals.

Early software was written for specific computers and sold with the hardware it ran on. In the 1980s, software began to be sold on floppy disks, and later on CDs and DVDs. Today, most software is purchased and directly downloaded over the internet. Software can be found on vendor websites or application service provider websites.

Types of software:-

1. **Application software**
2. **System software**
3. **Driver software**
4. **Middleware**
5. **Programming software**

Application software :- The most common type of software, application software is a computer software package that performs a specific function for a user, or in some cases, for another application. An application can be self-contained, or it can be a group of programs that run the application for the user. Examples of modern applications include office suites, graphics software, databases and database management programs, web browsers, word processors, software development tools, image editors and communication platforms.

System software :- These software programs are designed to run a computer's application programs and hardware. System software coordinates the activities and functions of the hardware and software. In addition, it controls the operations of the computer hardware and provides an environment or platform for all the other types of software to work in. The OS is the best example of system software; it manages all the other computer programs. Other examples of system software include the firmware, computer language translators and system utilities.

Driver software : Also known as device drivers, this software is often considered a type of system software. Device drivers control the devices and peripherals connected to a computer, enabling them to perform their specific tasks. Every device that is connected to a computer needs at least one device driver to function. Examples include software that comes with any nonstandard hardware, including special game controllers, as well as

the software that enables standard hardware, such as USB storage devices, keyboards, headphones and printers.

Middleware :- The term *middleware* describes software that mediates between application and system software or between two different kinds of application software. For example, middleware enables Microsoft Windows to talk to Excel and Word. It is also used to send a remote work request from an application in a computer that has one kind of OS, to an application in a computer with a different OS. It also enables newer applications to work with legacy ones

Programming software :- Computer programmers use programming software to write code. Programming software and programming tools enable developers to develop, write, test and debug other software programs. Examples of programming software include assemblers, compilers, debuggers and interpreters.

✚ How the software development lifecycle works?



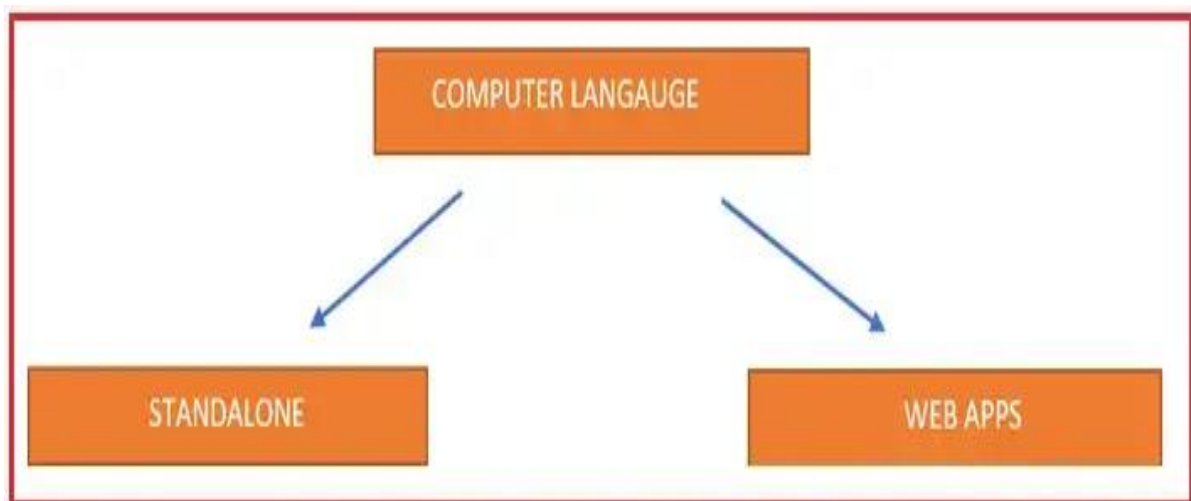
QUESTION: 2 What are the types of Applications?

In this article, I am going to give a brief **introduction to the types of applications**, mainly how many types of applications we can develop using different programming languages. Please read our previous article, where we discussed **Translators in Programming Languages**.

🚦 Types of Applications

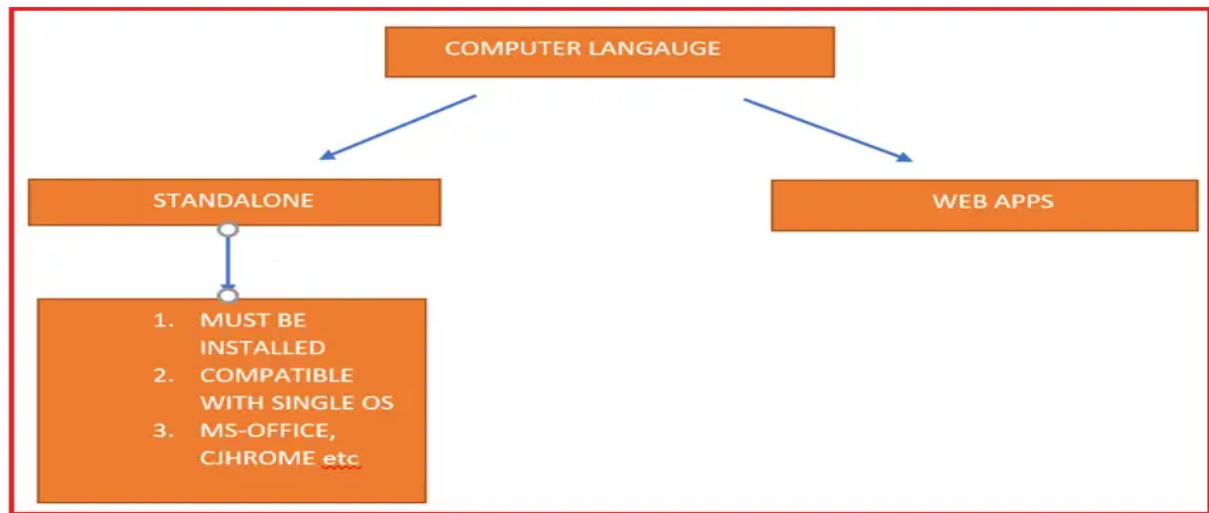
➤ There are 2 types of applications:

1. **STANDALONE APPS**
2. **WEB APPLICATIONS**



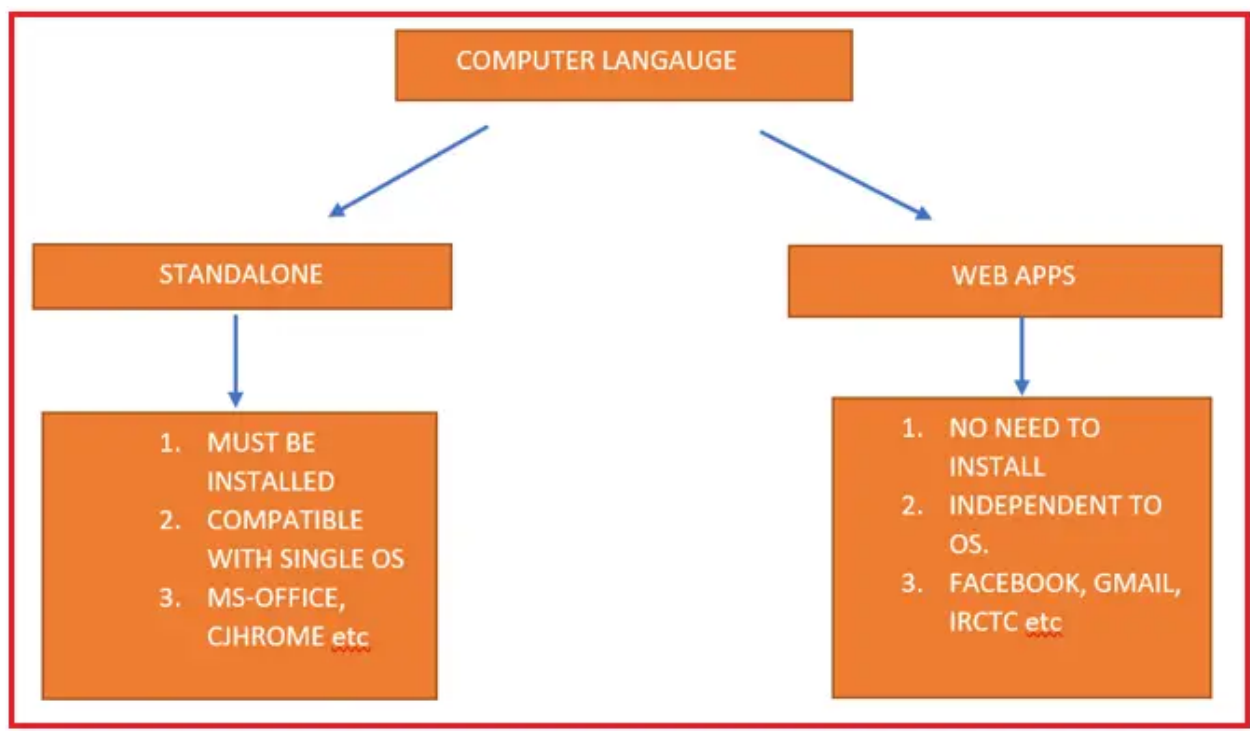
1)What are standalone apps?

- The application we are installing on our computer is called a standalone application. To work with any application, if you install that software into your computer then it is called a standalone application. For Example, if you want to play some videos, generally we are using VLC PLAYER. To create a documentation or PowerPoint presentation we go for ms office. To browse something from the internet we are using Mozilla Firefox or Google Chrome. All these are standalone applications.
- The standalone application is always compatible with a single operating system. We have to specify which operating system we are using, which is important. Application is always dependent on an operating system is called a standalone application.



2) What are web applications?

Without installing any software, we are working with the software called a web application. Regularly we are using gmail.com, facebook.com, YouTube, and google.com, we don't need to install these applications before using them. It is independent of the operating system, that is not dependent on a particular operating system. Examples: Facebook, Gmail, IRCTC.



QUESTION: 3 What is programming?

Programming refers to a technological process for telling a computer which tasks to perform in order to solve problems. You can think of programming as a collaboration between humans and computers, in which humans create instructions for a computer to follow (code) in a language computers can understand.

✚ Programming enables so many things in our lives. Here are some examples:

- When you browse a website to find information, contact a service provider, or make a purchase, programming allows you to interact with the site's on-page elements, such as sign-up or purchase buttons, contact forms, and drop-down menus.
- The programming behind a mobile app can make it possible for you to order food, book a rideshare service, track your fitness, access media, and more with ease.
- Programming helps businesses operate more efficiently through different software for file storage and automation and video conferencing tools to connect people globally, among other things.
- Space exploration is made possible through programming.

✚ How does computer programming work?

At its most basic, programming tells a computer what to do. First, a programmer writes code—a set of letters, numbers, and other characters. Next, a compiler converts each line of code into a language a computer can understand. Then, the computer scans the code and executes it, thereby performing a task or series of tasks. Tasks might include displaying an image on a webpage or changing the font of a section of text.

✚ Types of programming languages

1. Procedural programming languages
2. Functional programming languages
3. Object-oriented programming languages
4. Scripting languages
5. Logic programming languages

Most used programming languages

Different programming languages enable programmers to write code that computers understand. According to a survey by Statista, the top five programming languages that developers use are:

- JavaScript
- HTML/CSS
- SQL
- Python
- TypeScript

- JavaScript

This language is used on every major web browser. Java script allows you to add complex features to a web page, such as content updates, interactive maps, and animated graphics, develop games, and more.

- HTML/CSS

These languages are used to create web pages and web applications. You would use HTML (HyperText Markup Language) to build web page structure, while CSS (Cascading Style Sheets) would enable you to determine the page's styling.

- SQL

SQL stands for Structured Query Language and is used to communicate with databases, including updating and retrieving data.

- Python

Python programming is most used in machine learning, web development, and desktop applications. Python is a popular language among beginners, as the syntax is relatively easy to learn. It is known as an object-oriented programming language

- TypeScript

TypeScript is a free, open-source programming language developed by Microsoft as a superset of JavaScript. It's used for developing large applications.

QUESTION: 4 What is Python?

Python is a high-level, general-purpose, and interpreted programming language used in various sectors including machine learning, artificial intelligence, data analysis, web development, and many more. Python is known for its ease of use, powerful standard library, and dynamic semantics. It also has a large community of developers who keep on contributing towards its growth. The major focus behind creating it is making it easier for developers to read and understand, also reducing the lines of code.

History of Python

Python, first created in 1980s by the Guido van Rossum, is one of the most popular programming languages. During his research at the National Research Institute for Mathematics and Computer Science in the Netherlands, he created Python – a super easy programming language in terms of reading and usage. The first ever version was released in the year 1991 which had only a few built-in data types and basic functionality.

Later, when it gained popularity among scientists for numerical computations and data analysis, in 1994, Python 1.0 was released with extra features like map, lambda, and filter functions. Followed by which adding new functionalities and bringing newer versions of Python came into fashion.

Python 1.5 released in 1997

Python 2.0 released in 2000

Python 3.0 in 2008 brought newer functionalities

The latest version of Python, Python 3.10 was released in 2021.

Newer functionalities being added to Python makes it more beneficial for developers and improved its performance. In recent years, Python has gained a lot of popularity and is a highly demanding programming language. It has spread its demand in various fields which includes machine learning, artificial intelligence, data analysis, web development, and many more giving you a high-paying job.

➤ Python Syntax

Syntax in a programming language is a standard way of expressing values or statements which every programming language follows.

To print a statement- print("Hello World")

Output: Hello World

A basic Python program to print a statement:

```
# code  
print("Hello World")
```

🌈 Features of Python

Python has plenty of features that make it the most demanding and more popular. Let's read about a few of the best features that Python has:

- ✓ Easy to read and understand
- ✓ Interpreted language
- ✓ Object-oriented programming language
- ✓ Free and open-source
- ✓ Versatile and Extensible
- ✓ Multi-platform
- ✓ Hundreds of libraries and frameworks
- ✓ Flexible, supports GUI
- ✓ Dynamically typed
- ✓ Huge and active community

🌈 Advantages and Disadvantages of Python

Every programming language comes with benefits and limitations as well. These benefits and limitations can be treated as advantages and disadvantages. Python also has a few disadvantages over many advantages. Let's discuss each here:

- Advantages of Python:

- ❖ Easy to learn, read, and understand
 - ❖ Versatile and open-source
 - ❖ Improves productivity
 - ❖ Supports libraries
 - ❖ Huge library
 - ❖ Strong community
 - ❖ Interpreted language
- Disadvantages of Python:
 - ❖ Runtime errors
 - ❖ Slow execution speed
 - ❖ Restrictions in design
 - ❖ Memory inefficient
 - ❖ Weak mobile computing

Applications of Python

Python is a highly-demanding and popular programming language used in various disciplines. Let's talk about a few of the major areas where Python is in great demand.

Developers can work on web development and create amazing and feature-rich websites using Python and its frameworks like Django. Python comes with inbuilt libraries and tools which makes the process of developing web applications easier.

You can also automate your tasks using Python with libraries like BeautifulSoup, pandas, matplotlib, etc. for scraping and web automation. You can also use Python to work on CAD (computer-aided designs) designs, to create 2D and 3D models digitally.

Using libraries like Pandas, and TensorFlow, experts can work on data analysis and machine learning applications for statistical analysis, data manipulation, etc.

Python can also be used by developers to build games using Pygame to develop 2D and 3D games. Some of the popular games built using Python are Pirates of the Caribbean, Battlefield 2, etc.

Refer: Top 10 Python Applications in Real World

Conclusion

Python has a lot of reasons which make it a more popular and highly demanding programming language. We have discussed all the pointers that any beginner who's starting to learn Python should focus on. If you want to become a Python developer, learn Python in-depth and try to gain more advanced concepts. Also, developers can use Python in developing feature-rich applications. Gain a deep knowledge of Python and be a successful Python developer.

