Python

Introduction

What is computer?

Python Introduction

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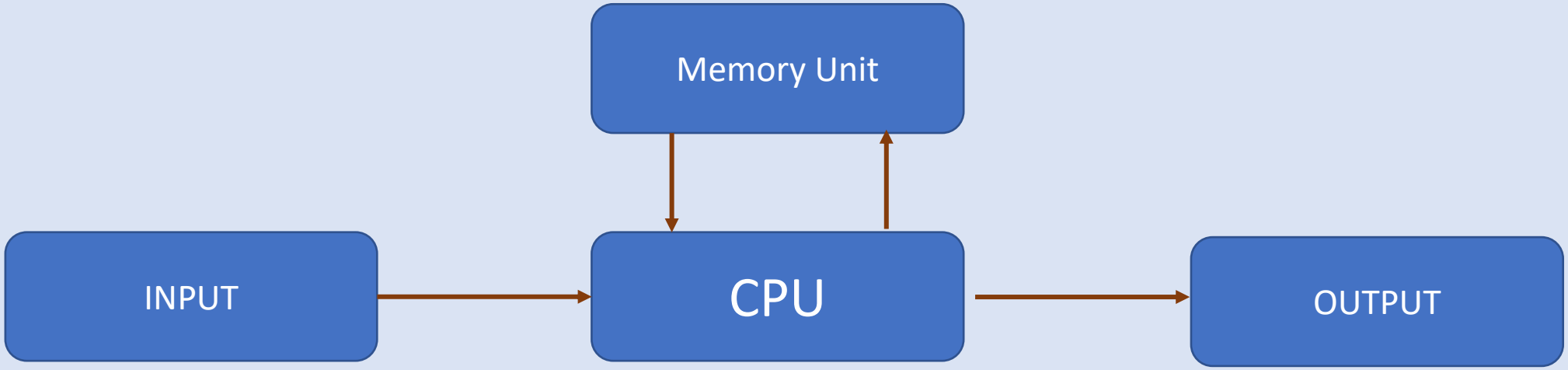


Python Introduction

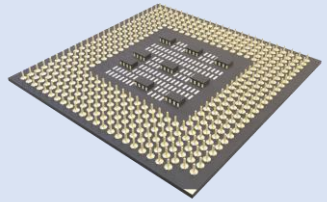
What is computer?

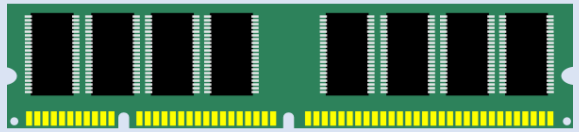
Memory Unit

Internal Memory

Primary Memory

Secondary Memory





Python Introduction

Overview of Programming Languages

Machine Language	Hard to read and write… has 1s and zeros only
Assembly Language	Hard to read and write… difficult syntax
Higher Level Language	Simple to read and write… simpler syntax

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Higher Level Programming Languages

- **STEP 1: An interpreter or compiler is used to translate a program written in a high-level language into its equivalent machine code for execution.**
- **STEP 2: A linker is used to combine the object code and the code stored in libraries into machine language**
- **STEP 3: Finally, the machine language code generated in Step 2 is executed**

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Steps to execute a high-level language program

Source Code (Program)

Compiler (Creates Object Code)

Linker Links Modules and Libraries of Program

Loader Executes the Program In Memory Location

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Complier

It is a software that translates a program written in a high-level language into machine language.

This compiled program is called object code.

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Interpreter

While a compiler converts the whole source code into an equivalent object code or machine code, the interpreter reads the source code line by line and converts it into object code (i.e. a code understandable to the machine.

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Linker

It is a program that links different program modules and libraries to form a single executable program. A source code of a program is very large. It can consist of hundreds of lines of code. Before the execution of a program, all the modules of the program and the required libraries are linked together using a software called a linker. The compiled and linked program is called the executable code

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Loader

This software is used to load and relocate an executable program in the main memory during execution.

The loader assigns a storage space to a program in the main memory for execution.

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Why Python is called scripting language?

A scripting language is one that is interpreted. Python is an interpreted language.

Python uses an interpreter to translate and run its code. Hence Python is a scripting language.

Python Introduction

Guido Van Rossum

The Professor

Python Introduction

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Features of Python

1. Python is interpreted language(does not require prior compilation)
2. Object oriented Language, High level programming
3. Simple to debug
4. Free and open source
5. Vast library support
6. Dynamically typed language
7. Programmer friendly Language (Easy to write, learn and read)

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Features of Python

(a) Free:
- Python is free to use and distribute and is supported by community.
- Python interpreter is available for every major platform.

(b) Software quality:
- Better than traditional and scripting languages.
- Readable code, hence reusable and maintainable.
- Support for advance reuse mechanisms.

(c) Developer productivity:
- Much better than statically typed languages.
- Much smaller code.
- Less to type, debug and maintain.
- No lengthy compile and link steps.

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Features of Python

d) Program portability:

- Python programs run unchanged on most platforms.
- Python runs on every major platform currently in use.
- Porting program to a new platform usually need only cut and paste. This is true even for GUI, DB access, Web programming, OS interfacing, Directory access, etc.

e) Support libraries:

- Strong library support from Text pattern matching to networking.
- Vast collection of third party libraries.
- Libraries for Web site construction, Numeric programming, Game development, Machine Learning etc.

Features of Python

(f) Component integration:

- Can invoke C, C++ libraries and Java components.
- Can communicate with frameworks such as COM, .NET.
- Can interact over networks with interfaces like SOAP, XML-RPC, CORBA.
- With appropriate glue code, Python can subclass C++, Java, C#. classes, thereby extending the reach of the program.
- Popularly used for product customization and extension.

(g) Enjoyment:

- Ease of use.
- Built-in toolset.
- Programming becomes pleasure than work.

Who uses Python ?

- Google makes extensive use of Python in its web search systems.
- The popular YouTube video sharing service is largely written in Python.
- The Dropbox storage service codes both its server and desktop client software primarily in Python.
- The Raspberry Pi single-board computer promotes Python as its educational language.
- EVE Online, a massively multiplayer online game (MMOG) by CCP Games, uses Python broadly.
- The widespread BitTorrent peer-to-peer file sharing system began its life as a Python program.

Who uses Python ?

- The IronPort email server product uses more than 1 million lines of Python code to do its job.
- Maya, a powerful integrated 3D modeling and animation system, provides a Python scripting API.
- iRobot uses Python to develop commercial and military robotic devices.
- Industrial Light & Magic, Pixar, and others use Python in the production of animated movies.
- ESRI uses Python as an end-user customization tool for its popular GIS mapping products.
- Googles App Engine web development framework uses Python as an application language.

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Who uses Python ?

- The Civilization IV game’ s customizable scripted events are written entirely in Python.
- The One Laptop Per Child (OLPC) project built its user interface and activity model in Python.
- Netflix and Yelp have both documented the role of Python in their software infrastructures.
- Intel, Cisco, Hewlett-Packard, Seagate, Qualcomm, and IBM use Python for hardware testing.
- JPMorgan Chase, UBS, Getco, and Citadel apply Python to financial market forecasting.
- NASA, Los Alamos, Fermilab, JPL, and others use Python for scientific programming tasks

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Identifiers and Keywords

- Python is a case sensitive language.
- Python identifier is a name used to identify a variable, function, class, module, or other object.
- Rules for creating identifiers:

  - Starts with alphabet or an underscore.

  - Followed by zero or more letters, _ , and digits.

  - keyword cannot be used as identifier.
- All keywords are in lowercase except TRUE and FALSE.
- Python has 33 keywords

Python Keywords

FALSE	continue	from	not
None	def	global	or
TRUE	del	if	pass
and	elif	import	raise
as	else	in	return
assert	except	is	try
break	finally	lambda	while
class	for	nonlocal	with
yield			

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Python Data types

Basic types - int, float, complex, bool, string, bytes

Container types - list, tuple, set, dict

User-defined types - class