→ Programming :-
It is a set of instructions that are given to machine to perform Specific Task
(OR)
It is a process of giving step by step instructions to a computer so it can perform a Task.

→ Programming Language :-
To give instruction to machine, we use programming language to perform the given task.
(OR)
It is a way to talk to a computer using special words and rules so it can understand what you want it to do.
ex:- print ("Akshaya")
↳ It is an instruction to tell computer to display the name/word Akshaya on the screen.

→ Different Levels of programming :-

① Low Level / Binary Programming :-
* Also known as "Machine level language"
* Language of Computer
* Written in 0's and 1's (Binary)
* Very fast but hard for human to understand
* ex:- 10110001
* In simple words, It's a machine friendly, Human unfriendly.
→ ANSII [American national standard institute of Information]

② Assembly Level programming [Low Level] :-
* Low level programming language which uses short, readable words instead of 0's and 1's.

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* The short words are called mnemonics
ex:- MOV, ADD, JUMP, SUB
* Closer to hardware & allows you to control the computer's CPU directly.
* It needs an Assembler to mnemonics to machine code (0's & 1's) since computer understands only Binary.
Assembler - It is a software that Converts Assembly language (MOV, ADD, SUB) into machine language (0's & 1's).
* Used in embedded system, robotics, device drivers etc...

③ High-Level programming :-
* Language which is easy to understand, read and write for humans.
* Looks like simple english.
* Works on different Computers (portable)
* Needs a translator like Compiler (or) Interpreter to Convert it into machine code.
Interpreter - Reads your code & executes line by line.
Compiler - First translates everything before execution.
* Better for large applications like Instagram, Twitter...

→ PYTHON [HISTORY] :-

* Developer of python - Guido van Rossum
* The Guido wanted language that is
→ easy to read
→ Simple to write
→ powerful and fun to use
* He named it "Python" after a comedy show called "Monty Python's Flying Circus".

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* Released first version of python 0.90.0 in feb 20 1991.
* Second Version ie pytho 2.0 in Oct 16 2000.
* Third version / current version ie python 3.0 in Dec 3 2008.
* Python became popular because it is
  → Beginner friendly
  → short and clean
  → Used in web apps, automation, data science, AI ....

→ PYTHON [3.14] :-

* Python is High-level, interpreted, object-oriented, and dynamically typed programming language that is easy to read and simple to use.
* Python is free, open-source, and used in many fields like web development, data science, AI and more.
* python is Interpreted
  → Code runs line by line
  → Makes debugging easy
  → No need to Compile the whole program.
* python is Object-oriented
  → Supports concepts like clases, objects, inheritence,
  → Helps to build clean and reusable code.
* python is dynamically Typed
  → dont need to declare variable Type
  → automatically decides the type at run-time.

→ Features of Python :-

* Easy to learn and read :- looks like simple english, so beginners understands it quickly.

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* Interpreted language
* Object - Oriented
* Dynamically Typed
* High - Level Language
* Cross - platforms :- Works on Windows, Mac, Linux
* Large standard library :- Has many inbuilt modules for math, file handling, networking, dates, data handling and more.
* Huge Community Support :- Millions of developers. Tutorials, Libraries and solutions available.
* Extensible & Embedded :- You can combine python with C, C++, Java also embed python in other application.
* Used everywhere like AI & ML, Data science, Web development, Automation, Cybersecurity, Game development IoT, scripting.

→ Advantages of python :-

* Very easy to learn
* Interpreted language
* Object-oriented
* Dynamically Typed
* Large standard library
* Cross - platform
* Huge Community Support
* Used everywhere / Highly Versatile

→ Disadvantages of python :-

* Slower than some languages - because it's interpreted and High level (not suitable for speed critical apps)

* Not great for Mobile app development - Android and iOS apps are usually built with other languages (Java/Kotlin/Swift)
* Higher Memory usage - Not suitable for low memory systems like small embedded devices
* Runtime error possible - Since dynamic, some errors only appear during execution.
* Not best for Game development - Games which need high performance often use C++ instead.