Comparison of C++, Java, and Python

General Language Features

Feature / Concept	C++	Java	Python
Language Type	Compiled	Bytecode (JVM)	Interpreted
Typing	Static	Static	Dynamic
Syntax Verbosity	Verbose	Verbose	Concise
Memory Management	Manual	Garbage Collected	Garbage Collected
OOP Support	Yes (Multiple)	Yes (Interfaces)	Yes (Multiple)
Access Modifiers	public/private/protected	public/private/protected	Convention (_var, __var)
Constructor / Destructor	Yes / Yes	Yes / finalize()	Yes / __del__()
Interfaces / Abstraction	Abstract Class, Virtual	Interfaces, Abstract Class	abc module
Templates / Generics	Templates	Generics	typing module
Use Cases	Systems, Embedded	Enterprise, Mobile	Scripting, ML, AI

OOP Syntax and Design Structures

OOP Concept	C++	Java	Python
Class Definition	class Car { ... };	class Car { ... }	class Car:
Constructor	Car() {}	Car() {}	def __init__(self):
Destructor	~Car()	finalize()	def __del__(self):
Member Function	void drive();	void drive() { }	def drive(self):
Object Creation	Car c;	Car c = new Car();	c = Car()
Inheritance	class A : public B	class A extends B	class A(B):
Multiple Inheritance	Yes	No	Yes
Polymorphism	virtual / override	@Override	Duck typing / override
Encapsulation	Enforced	Enforced	By convention
Composition	Engine e;	Engine e = new Engine();	self.e = Engine()
Aggregation	Pointer or ref	Constructor injection	Constructor injection
Dependency	Use in method	Use in method	Use in method
Static Members	static int x;	static int x;	@staticmethod
Operator Overloading	Yes	No	Yes (__add__, etc)