

### 1. Primitive (Built-in) Types

Category	Python Type	Description	Example
Text	str	Strings, characters	"Hello"
Integer	int	Whole numbers	42
Floating-point	float	Decimal numbers	3.14
Complex	complex	Real + imaginary	3+4j
Boolean	bool	True / False	True
Null	NoneType	Absence of value	None

### 2. Collections (Built-in Containers)

Category	Python Type	Description	Example
Sequence	list	Ordered, mutable	[1,2,3]
-	tuple	Ordered, immutable	(1,2,3)
-	range	Sequence generator	range(0,10)
Set Types	set	Unordered, unique values	{1,2,3}
-	frozenset	Immutable set	frozenset({1,2})
Mapping	dict	Key-value pairs	{"name": "Richard"}

### 3. Specialized Types

Category	Python Type	Description
Binary Data	bytes / bytearray	Raw 8-bit data (images, network packets)
Enumerations	Enum	Predefined restricted categories
Callable Types	function, lambda, method	Used in OOP and functional programming
Custom Classes	user-defined	Used in large real-world applications

### 4. Pandas Data Types (Real-World DS/DA Use)

Category	Pandas dtype	Description
Text	string (modern), object (legacy)	String values
Integer	int64, Int64 (nullable)	Whole numbers
Float	float64	Decimals
Boolean	bool, boolean (nullable)	True/False
Categorical	category	Fixed categories (gender, status, etc.)
Datetime	datetime64[ns]	Timestamps
Timedelta	timedelta64[ns]	Time durations
Sparse Types	Sparse[int], Sparse[float]	Memory-efficient storage

