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1. Call by Value vs Call by Reference

Aspect	Call by Value	Call by Reference
Definition	A copy of the variable's value is passed to the function. Changes inside the function do not affect the original variable.	A reference (memory address) of the variable is passed to the function. Changes inside the function affect the original variable.
Mutability	Works with immutable objects in Python (e.g., integers, strings).	Works with mutable objects in Python (e.g., lists, dictionaries).
Behavior	Original data remains unchanged.	Original data may be modified.
Example in Python	Immutable objects like integers behave this way.	Mutable objects like lists and dictionaries behave this way.

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2. Keyword vs Identifier

Aspect	Keyword	Identifier
Definition	Reserved words in Python with a predefined meaning in the language. Cannot be used for variable or function names.	User-defined names for variables, functions, classes, etc. Must follow naming rules.
Usage	Part of Python syntax (e.g., if, else, while).	Used to identify program elements (e.g., my_var, func).
Restriction	Cannot be redefined by the user.	Must not conflict with keywords.
Example	if, def, class.	my_variable, calculateSum.

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3. Python 2 vs Python 3

Aspect	Python 2	Python 3
Print Statement	Uses print without parentheses (print "Hello").	Uses print() with parentheses (print("Hello")).
Integer Division	Integer division truncates the result (5 / 2 = 2).	Division always returns a float (5 / 2 = 2.5).
Unicode Support	Strings are ASCII by default.	Strings are Unicode by default.

Aspect	Python 2	Python 3
Community Support	No longer maintained (end of life in 2020).	Actively supported and updated.

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4. Difference Between For Loop and While Loop

Aspect	For Loop	While Loop
Definition	Iterates over a sequence (e.g., list, range).	Repeats based on a condition until it becomes False.
Use Case	When the number of iterations is known in advance.	When the number of iterations is not predetermined.
Syntax	for i in range(10): ...	while condition: ...
Example Use	Iterating through elements in a list.	Waiting for a condition to change dynamically.

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5. Difference Between == and is Operator

Aspect	== Operator	is Operator
Definition	Compares the **values** of two objects.	Compares the **memory location** of two objects.
Use Case	To check if two objects have equivalent data.	To check if two objects are the same (identical in memory).
Behavior with Mutable Types	Compares content (e.g., lists, dictionaries).	Compares memory addresses (different objects with the same content will return False).
Behavior with Immutable Types	May return True for equal values.	Can return True if the values are interned (e.g., small integers, strings).
Example	a == b (checks value equality).	a is b (checks identity).