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Python Generator

Ft. Munna Bhai and Circuit

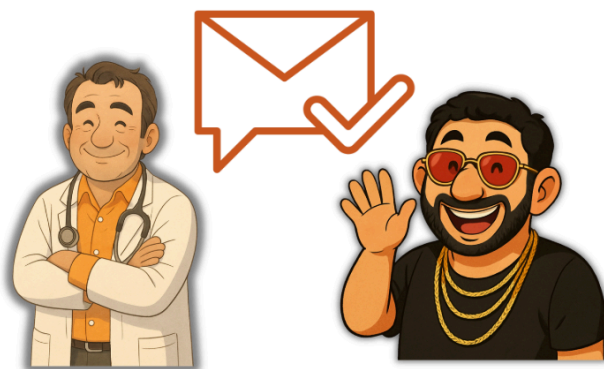
- A generator function in Python is a special type of function that generates values one at a time using the yield keyword, instead of returning all values at once like a regular function.



- It creates an iterator, allowing you to iterate over values lazily (on-demand), which saves memory and improves performance.

Analogy:

Imagine Munna Bhai (the caller) needs Circuit to perform tasks, like delivering messages to his gang.



Instead of Circuit gathering all messages at once and dumping them on Munna (like a regular function returning a list), Circuit comes when called, delivers one message, and waits for

Munna's next call.



This is efficient because Circuit doesn't waste energy holding all messages in memory—he delivers them one by one, just like a generator yields values.



Where to Use Generator Functions?



- ☐ **Large Data Processing** (e.g., reading a huge file line by line)
- ☐ **Infinite Sequences** (e.g., Fibonacci numbers)
- ☐ **Streaming Data** (e.g., streaming logs or sensor data)
- ☐ **Lazy Evaluation** (improving performance)

Generator vs Regular Function

Aspect	Generator Function	Regular Function
Output	Yields one value at a time using yield .	Returns all values at once using return .
Memory Usage	Memory-efficient: Generates values on-demand.	Memory-intensive: Stores all results in memory.
Execution	Pauses after each yield and resumes on next().	Runs to completion and returns the result.
Use Case	Large datasets, infinite sequences, lazy evaluation.	Small, finite computations with immediate results.
Example	yield one message at a time (delivers one by one).	Returns all messages in a list (Circuit dumps everything).

Generator vs Regular function (Ft. Munnabhai and Circuit) :

Regular Function: Munna asks Circuit to collect all messages from the gang and bring them in one go. Circuit returns a big list of messages, using up time and space.



Generator Function: Munna asks Circuit to deliver one message at a time. Circuit comes, gives one message, and waits for Munna to call again. This saves Circuit's energy (memory) and time.

