Python Important Questions for Data Science Interview

1. Difference between @staticmethod, @classmethod, and instance methods
2. What are generators? How do they improve memory efficiency?
3. Decorators – use cases, syntax, and real-world applications
4. map(), filter(), and reduce() – what's the difference and when to use each?
5. How does Python's Global Interpreter Lock (GIL) impact multithreading?
6. Difference between multiprocessing and multithreading in Python
7. What are closures in Python? Explain with example
8. What is a context manager? How does the with statement work?
9. How is memory managed in Python internally?
10. deepcopy() vs copy() vs assignment – which one should you use and why?
11. Explain __str__() vs __repr__() – when are they used in real scenarios?
12. Difference between isinstance() and type()
13. Use case of yield in data pipelines
14. Explain monkey patching with a practical example
15. How does exception propagation work in nested function calls?
16. When and why would you use *args and **kwargs in production code?
17. What is duck typing? How does it support polymorphism in Python?
18. How do you handle large files or streaming data efficiently in Python?
19. What are metaclasses? Do we really use them?
20. How does @lru_cache from functools help in optimization?