Python Questions & Answers

1. What is Python?

- Python is a high-level, interpreted programming language known for its readability and simplicity.

2. What are Python's key features?

- Interpreted, Dynamically Typed, High-Level, Extensive Libraries, and Object-Oriented.

3. What is PEP 8?

- PEP 8 is a style guide for writing clean and readable Python code.

4. What is the difference between lists and tuples?

- Lists are mutable, whereas tuples are immutable.

5. What are Python's data types?

- int, float, str, list, tuple, dict, set, bool, etc.

6. What is a dictionary in Python?

- A dictionary is a collection of key-value pairs.

7. What is list comprehension?

- A concise way to create lists in Python using a single line of code.

8. What is the difference between deep copy and shallow copy?

- A deep copy duplicates everything, while a shallow copy only copies references.

9. What is the difference between 'is' and '=='?

- 'is' compares object identity, while '==' compares values.

10. What is a lambda function?

- A small anonymous function defined using the `lambda` keyword.

11. What is the difference between `append()` and `extend()`?

- `append()` adds a single element, while `extend()` adds multiple elements from an iterable.

12. What is Python's garbage collection mechanism?

- It uses reference counting and a cyclic garbage collector.

13. What are *args and **kwargs in Python?

- `*args` allows passing a variable number of positional arguments, and `**kwargs` allows passing keyword arguments.

14. What is the difference between @staticmethod and @classmethod?

- `@staticmethod` does not take `self`, whereas `@classmethod` takes `cls` as its first argument.

15. How does exception handling work in Python?

- Using `try`, `except`, `finally`, and `raise` keywords.

16. What is the use of the `with` statement?

- It is used for resource management (e.g., file handling) to ensure proper cleanup.

17. What are Python generators?

- Functions that yield values using `yield` and maintain their state.

18. What is the purpose of `self` in Python classes?

- `self` represents the instance of the class and allows access to instance attributes and methods.

19. What is the difference between Python 2 and Python 3?

- Python 3 improves syntax, Unicode handling, print function, and removes some legacy constructs.

20. What is Django?

- Django is a high-level Python web framework for rapid development.

21. What is Flask?

- Flask is a lightweight web framework for building web applications in Python.

22. What is the Global Interpreter Lock (GIL)?

- A mechanism that prevents multiple native threads from executing Python bytecodes in parallel.

23. What is multithreading in Python?

- Running multiple threads in a program to perform tasks concurrently.

24. How do you create a virtual environment in Python?

- Using `venv`: `python -m venv myenv`

25. What is the difference between `del`, `remove()`, and `pop()`?

- `del` deletes by index, `remove()` deletes by value, and `pop()` removes and returns an element.

26. How do you install external libraries in Python?

- Using `pip install library_name`.

27. What is NumPy?

- NumPy is a library for numerical computations in Python.

28. What is Pandas?

- Pandas is a library for data manipulation and analysis.

29. What is Machine Learning in Python?

- Machine Learning is a field of AI that allows computers to learn patterns and make predictions.

30. What is TensorFlow?

- TensorFlow is an open-source library for machine learning and deep learning.