Python 20 question

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**1. What is Python?**

Python is a high-level, interpreted programming language known for its simple syntax and readability. It supports multiple programming paradigms, including object-oriented, procedural, and functional programming.

**2. Areas Where Python is Used:**

* **Web Development** (e.g., Django, Flask)
* **Data Science & Machine Learning** (e.g., Pandas, NumPy, TensorFlow)
* **Artificial Intelligence**
* **Automation/Scripting**
* **Software Development**
* **Game Development**
* **Cybersecurity**
* **Internet of Things (IoT)**

**3. High-Level vs Low-Level Language:**

* **High-Level Language**: Easier for humans to read and write (e.g., Python, Java).
* **Low-Level Language**: Closer to machine code, harder to read (e.g., Assembly, C).

**4. What is an Interpreted Language?**

An interpreted language executes code line-by-line at runtime. Python is an interpreted language.

**5. What is a Compiled Language?**

A compiled language converts the whole program into machine code before execution (e.g., C, C++).

**6. Statically Typed Language:**

Variables are declared with fixed types at compile-time (e.g., Java, C++). Type cannot change later.

**7. Dynamically Typed Language:**

Variables can change type at runtime. Python is dynamically typed.

**8. What is Weakly Typed?**

A weakly typed language performs implicit type conversion (e.g., JavaScript: 1 + "2" gives "12").

**9. What is Strongly Typed?**

A strongly typed language enforces strict type rules; no implicit conversions unless explicitly done. Python is strongly typed.

**10. What is .pyc File (Bytecode)?**

A .pyc file is a compiled version of a .py file into Python bytecode, used by the Python Virtual Machine (PVM) for faster execution.

**11. What is PVM?**

PVM (Python Virtual Machine) executes the Python bytecode generated after compiling .py files.

**12. How Python Internally Works?**

1. Source Code (.py)
2. Compiled to Bytecode (.pyc)
3. Bytecode is interpreted by the **Python Virtual Machine (PVM)** and executed.

**13. What is PEP 8?**

PEP 8 is the **Python Enhancement Proposal** that provides style guidelines for writing readable Python code.

**14. What is PIP and its Use?**

PIP is the Python package manager used to install and manage Python packages and libraries (e.g., pip install numpy).

**15. What is Bytecode and When is it Created?**

Bytecode is an intermediate code between source code and machine code. It is created when a Python file is run and saved as .pyc.

**16. What is Indentation in Python?**

Indentation refers to spaces/tabs at the beginning of a line. Python **relies on indentation** to define code blocks, unlike other languages that use {}.

**17. What is a Variable?**

A variable is a name that stores a value. It refers to a location in memory where data is stored.

**18. Variable Naming Rules:**

* Must start with a letter or underscore.
* Can contain letters, digits, and underscores.
* Cannot use Python keywords.
* Case-sensitive.

**19. What is a Datatype and Names of Datatypes:**

A **datatype** defines the type of data a variable can hold.

**Common Python datatypes:**

* int – Integer
* float – Decimal numbers
* str – String
* bool – Boolean
* list
* tuple
* dict – Dictionary
* set
* NoneType

**20. What is a Keyword in Python?**

Keywords are reserved words that have special meaning in Python and cannot be used as variable names (e.g., if, for, while, def, class).

Let me know if you'd like these in a printable format or need more detail on any topic.