Day 1 - Interview Questions

1. **What is a programming language, and why do we need it?**
   A programming language is a set of instructions that allows humans to communicate with computers. We need programming languages to write software and create applications that can perform various tasks, from simple calculations to complex data processing.

2. **Explain the difference between a compiler and an interpreter.**
   A compiler translates the entire source code into machine code or an intermediate code all at once before execution. An interpreter, on the other hand, translates and executes code line by line. Python and JavaScript are examples of languages that use interpreters, while languages like C++ and Java typically use compilers.

3. **What is machine language, and how does it differ from high-level programming languages?**
   Machine language consists of binary code that directly corresponds to the instructions executed by the CPU. High-level programming languages use human-readable code and require compilation or interpretation before execution.

4. **What is debugging, and why is it important in programming?**
   Debugging is the process of identifying and fixing errors, or bugs, in a program. It is crucial in programming because it ensures that the software functions correctly and produces the desired results.

5. **What is an algorithm?**
   An algorithm is a step-by-step procedure or set of instructions for solving a particular problem or performing a specific task. It is a fundamental concept in programming and is used to design and implement solutions in code.

6. **What is PEP 8, and why is it important in Python programming?**
   PEP 8 is the Python Enhancement Proposal that defines the style guide for writing Python code. It promotes consistency and readability by specifying conventions for naming, indentation, and code structure. Adhering to PEP 8 helps maintain clean and maintainable code.

7. **What are the key features of python?**
   Python is a high-level, interpreted programming language known for its simplicity and readability. Key features include dynamic typing, automatic memory management (garbage collection), a large standard library, and support for multiple programming paradigms (procedural, object-oriented, and functional).

8. **What is the purpose of the PATH environment variable during Python installation on Windows?**
   The PATH environment variable in Windows specifies a list of directories where

executable files are located. Adding Python's installation directory to the PATH allows you to run Python from any command prompt without specifying the full path to the Python executable.

9. **How can you check if Python is installed correctly on your system?**
   You can open a terminal or command prompt and type

   python --version or python3 --version.

   This command will display the installed Python version.

10. **How can you install Python packages and libraries in an IDE like PyCharm or VSCode?**
    You can typically install Python packages using the built-in package manager or by using the terminal within the IDE. For example, in VSCode, you can use the integrated terminal and run pip install package_name.