Unit 1 Quiz

1. **One of the components of a computer is the CPU. What is a CPU and what role does it play in a computer?**

   The Central Processing Unit is the “brain” of a computer. It is responsible for executing the instructions of a progra , performing calculations, and managing the flow of data within the system. The CPU’s primary role is to fetch instructions from memory decode them, execute them, and then store the results. It houses the ALU(Arithmetic Logic Unit) which performs arithmetic and logical operations. It also houses registers, which are small, high-speed memory locations used to store data and instructions.

2. **Explain what is meant by an “asynchronous event.” Give some examples**

   An asynchronous event is an event that occurs independent of the main program flow, at an unpredictable time. ie. Mouse Clicks, Keyboard Presses, Network Requests, Timer Events, and Hardware interrupts.

3. **What is the difference between a “compiler” and an “interpreter”?**

   The difference lies in how they translate high-level programming languages into machine-readable code:

   Compiler: A compiler translates the entire high-level language program into machine language all at once. This is done before the program is executed. The resulting machine code can be run independently with the need for the compiler.

   Interpreter: An interpreter translates and executes high-level language program line by program line or statement by statement. It does not create a separate executable file. It reads each line of code, converts it into machine instructions, and immediately executes those instructions.

4. **Explain the difference between “high-level languages” and “machine learning.”**

   High-level language is meant to be more user-friendly and easier for humans to understand and write. They use human-readable syntax and hide the complexities of the underlying hardware.

   Machine language is the lowest level programming language and is directly understood vby the computer’s hardware. Each type of computer has its own specific machine language, and writing programs directly in machine language is tedious and error prone.

5. **If you have the source code for a Java program, and you want to run that program, you will need both a compiler and an interpreter. What does the Java compiler do and what does the Java interpreter do?**

   The Java compiler takes the source code of a Java program and translates it into Java bytecode. Bytecode is an intermediate representation of the program that is not directly executable by any specific computer's hardware. Instead, it is designed to be run on the Java Virtual Machine (JVM)

   The Java Interpreter(JVM), which is a core component of the JVM, takes the Java bytecode generated by the compiler and executes it. The JVM interprets the bytecode instructions one by one, translating them into the native machine code of the underlying computer architecture. This allows the Java program to run on any system that has a compatible JVM installed, making Java a platform-independent language.

6. **What is a subroutine?**

   In Java, a subroutine is more commonly referred to as a Method. A Method is essentially a named block of code that performs a specific task. It's a way to modularize your code, making it more organized, reusable, and easier to manage.

7. **Java is an object-oriented programming language. What is an object?**

   An object is a self-contained entity that represents a real-world object or concept, encapsulating both data(attributes and properties) and the actions (Methods or behaviors) that can be performed on that data.

   OOP allows a bottom-up approach to tackling a problem and allows the reuse of code

8. **What is a variable?(there are 4 different ideas associated with variables in Java. Try to mention all four aspects in your answer. Hint: One of the aspects is the variable's name)**

   A variable is a named memory location that stores a value. The 4 key aspects include Name, Type, Value, and Memory Location.

9. **Java is a "platform-independent language." What does this mean?**

   This means that Java can be run on any operating system as long as it has JVM installed.

10. **What is the "internet"? Give some examples of how it is used. (What kind of services does it provide?)**

The internet is a global network of interconnected computers and devices that communicate with exh other using a stadardized set of protocols. Essentially a vast network of networks. It is used in many ways including the Word Wide Web, Email, File Trasfer Protocol, and social networking