Exercise 4

1. **What is a computer? What is the main component of computer hardware?**

   A computer is a machine that performs computations based on a set of instructions. A computer can be split into two components: software and hardware. The main components of computer hardware are the CPU (central processing unit), memory, secondary storage, I/O devices, network, and the bus.

2. **Explain the compilation process.**

   The role of the compilation process is to convert high-level language to machine language. First the high level language is written in some file known as the source code (.java file if programming in java). It is then converted into a .class file (if using java) and compiled into a bytecode. Finally, the computer runs the output in some virtual machine (JVM if using Java).

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

   The key difference between an interpreter and a compiler lies in how much it compiles at a time. An interpreter translates line by line reading one statement at a time. However, a compiler translates the entirety of the source code to output the entire code at once.

4. **What is a Java Virtual Machine?**

   The Java Virtual Machine (JVM) interprets bytecode for a computer's processor so that it can run the functions defined in the source code. It allows for programs to be built to run on any platform without having to be rewritten or recompiled.

5. **Define the following terms in no more than two sentences:**

   High Level Language

   High level language is the language that a programmer uses to write the instructions that they want the computer to output.

   Machine Language

   Machine language is the language only understood by computer which is known as binary code (consisting od 0's and 1's).

   Software Development

Software development is the process of developing a software based product. The development process can be divided into 7 steps: Requirement analysis, Design, Implementation, Testing, Documentation, Training/Support, and Maintenance.

Programming

Programming is the writing of instructions of programs through coding on a computer. It is usually written to solve a particular problem in a specified language.

Algorithm

An algorithm is the set of instructions used for solving a certain problem or task.

Compiler

A compiler is used to translate high level language to machine language for machines to execute code.

Java Virtual Machine

The Java Virtual Machine is a program that interprets bytecode so that it can run the output of a source code on any platform without having to recompile or rewrite.