As I do updates throughout the semester I am going to add them to this formal essay. This is the first update after the outline. Update: two pages in length.

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Programing Languages

Term Paper

Java and C++

Java, a programming language, was developed by Sun Microsystems in the 1990s. It was primarily used for internet applications. But Java is also a “simple, efficient, general-purpose language” (Austerlitz, *Data Acquisition Techniques Using PCs*). This language is usable across platforms, object oriented and interpreted. Java is extremely portable; “The same Java application will run identically on any computer, regardless of hardware features or operating system, as long as it has a Java interpreter” (Austerlitz, *Data Acquisition Techniques Using PCs*). Java has a number of key security features such as protection from erroneous code, malicious code and viruses. A user can safely run Java programs on their computer because the language prevents the code from accessing a hard drive or network connections. Java also has a feature called Java Applets. This feature is renownedly popular in the computer industry as it allows for small programs to be embedded on web pages. “Java can be considered both a compiled and an interpreted language because its source code is first compiled into a binary byte-code. This byte-code runs on the [Java Virtual Machine](https://www.sciencedirect.com/topics/computer-science/java-virtual-machines) (JVM), which is usually a software-based interpreter” (Austerlitz, *Data Acquisition Techniques Using PCs*). Due to this feature, the interpreter can run the code nearly as fast as the CPU running naive. This also allows the language to be multi-platform as it can run on any computer with the interpreter. Java is also very popular as most web browsers use it to run the applets explained earlier.

There are some key differences between Java and C++, which do not make one language better than the other, but instead better for different uses than the other. For example, “compared to C++ (another object-oriented language), Java code runs a little slower (because of the JVM) but it is more portable and has much better security features” (Austerlitz, *Data Acquisition Techniques Using PCs*). While C++ permits the user to overload the computer, Java does not. Java is also a dynamic language, meaning that the user can modify the code while it is running as C++ does not support this. This is a key feature that makes Java better for networks as they may not be able to afford downtime. C++ contains predefined data types which may change from platform to platform while Java is the same on any platform. Java is considered to be of a higher structure than C++ equivalents, “ all functions (or Java methods) and executable statements in Java must reside within a class while C++ allows function definitions and lines of code to exist outside of classes (as in C-style programs). Global data and methods cannot reside outside of a class in Java, whereas C++ allows this” (Austerlitz, *Data Acquisition Techniques Using PCs*). This allows the security and forced object orientedness of Java while it also lets C++ be a more dynamic and possibly user-friendly language.

\ There are some key similarities between Java and C++, the main one being that; “Java's syntax is similar to C++” (Austerlitz, *Data Acquisition Techniques Using PCs*).

Works Cited

Austerlitz, Howard. *Data Acquisition Techniques Using PCs*. 2nd ed., 2003, www.sciencedirect.com/topics/computer-science/java-programming-language#:~:text=The%20Java%20programming%20language%20was,applications%20running%20on%20multiple%20platforms.. Accessed 24 Jan. 2022.