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CS-210

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1-5 Assignment

1. **Explain the benefits and drawbacks of using C++ and Visual Studio in a coding project.**

C++ is a popular and versatile programming language that can be used to build apps we all use, video games, and even SQL (Xiao, 2023). C++ is a foundational language for any aspiring dev. With its focus on GUI applications, C++ will allow us to create more than just CLI applications like we have in our previous computer science courses.

While C++ is a versatile language, it is not as versatile as something like Java that can be used to build anything and has been used to create just as much if not more than C++. Unlike Python, C++ is a compiled language and is much more verbose. The Python program that I made for this assignment was a single line. The C++ counterpart required an import and four lines of code.

Visual Studio is a nice modern IDE just like many other offerings. Having the compiler built in makes the process easy for getting started as a newcomer to C++.

2. **Explain the benefits and drawbacks of using Java and Eclipse or Python and PyCharm in a coding project.**

Using Python for the first time is what got me excited to study computer science. Outside of that personal benefit to Python, being a functional programming language, it is far more approachable for newcomers. Python allows almost anyone to get started making programs right away and is far more forgiving with syntax and variable declaration/initialization. Likewise, Python and Jupyter notebooks are used in data science and make scientific tools readily available to a mass audience with little setup.

Because Python is interpreted and not compiled, Python programs are much slower than C++ programs (S, 2024). This is relevant in the "real world" as some mission critical applications like operating systems or industrial machines need fast and capable code that something like Python cannot provide.

PyCharm, and JetBrains IDEs generally, are by far my favorite environment to work in. The IDEs are incredibly user friendly and allow you to get up and running in now time. It is a pleasure to use PyCharm.

3. **Describe the advantages of being able to code in multiple coding languages and compilers.**

Each programming language, especially modern hyper-specific options, deals with a different problem in computer science (Lagutin, 2021). This means that using a general-purpose language, like Java, may not be the best-optimized option for something like GUI applications. C++ is a great option for working with graphical interfaces.

In addition to specialization, knowing a variety of languages or frameworks will help us in the employment market. Coming out of this degree with close to full stack experience will be extremely marketable. More than that, studying many coding paradigms will deepen my knowledge of universal computer science principles that can be taken from langauge to language and project to project.

References

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Xiao, L. (2023, February 1). *What is C++ used for?*. Codecademy Blog. https://www.codecademy.com/resources/blog/what-is-c-plus-plus-used-for/