**7-1 Project Three Submission**

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Explain the benefits and drawbacks of using C++ in a coding project.

Below is a nice descriptive analysis of advantages and disadvantages of C++ from Geeks for Geeks website. I usually paraphrase large amount of text like this. I like the way it was layed was described.

“C++ is a general-purpose programming language and widely used nowadays for competitive programming. It has imperative, object-oriented, and generic programming features. C++ runs on lots of platforms like Windows, Linux, Unix, Mac, etc. But there are the benefits and drawbacks of C++ on the idea of which they will start their new journey of programming. It is one of the oldest and most effective languages that also continues to dominate the realm of programming.” (Geeks For Geeks, 2021)

**Advantages of C++:**

* C++ is an object-oriented programming language. It may be a collection of commands, which tell the pc to try to do “something.” This collection of commands is typically called C++ ASCII text files.
* C++ could also be a problem-oriented language that’s much easier to use than the other low-level languages like binary coding. It takes much more space than low-level languages but it’s much easier to understand and learn.
* C++ program has many advantages when it involves programming, All C++ program stand-alone files must use the foremost function to allow the program to start out up and motivate its functions.
* C++ program can support unions and structures that are a mix of stand-alone and put-together files, It uses the standard C++ application mentioned as “.cpp”, C++ uses the reserved library word mentioned as “goto” that’s the same as Java’s continue, or break commands.
* The global data and global functions are used within C++ that aren’t utilized in many other high-level languages within the pc sciences and it is an advantage to the programming languages.
* As C++ doesn’t use the objects, it’s difficult to make the programs that have inheritance data and thus the reformed the programs to contribute to the other data and therefore the programs, it is possible to undertake to the present, however, but is difficult, These inheritance data and programs are mentioned because of the inheritance trees.
* C++ doesn’t support class methods that are faithful away, but class methods are basically functions, and sometimes they’re referred to as functions.
* C++ program uses multi-paradigm programming, Paradigm means the planning of programming, paradigm concerned about the logic, the structure, and procedure of program, C++ program is multi-paradigm means it follows three paradigms Generic, Imperative, Object-Oriented.
* C++ program is useful for low-level programming language and really efficient for general purposes, It offers performance and memory efficiently, It offers high-level abstraction, within the language of the matter domain
* C++ may be a system programming and features a relatively clear and mature standard,
* C++ program supports inline function, C++ supports exception handling, it’s pointer and references, C++ uses cin and cout.

**Disadvantages of C++:**

* One major problem in C++ is when the info points to an equivalent thing from two different starting points, this causes a serious problem, the C++ program will still have involved problems within the coding.
* Java’s uni-code to the ASCII rules is 16-bit, while C++ program is 8-bit only, So, C++ may be a less impressive programming language but saves the memory.
* C++ program is complex during a very large high-level program, C++ is employed for platform-specific application commonly, For the actual OS or platform, the library set is typically chosen.
* C++ program can’t support garbage pickup, It doesn’t support Dynamic Memory Allocation, it’s not secure because it’s a pointer, friend function, and global variable and it’s no support for threads built-in.
* C++ programs are often heavy if it’s not careful, C++ program allows classes and thus the functions with an equivalent name and overloaded functions thus the symbol mangling system must be used, It can easily be wrapped in C functions though.
* C++ program has no notion of being fast and it’s not used for platform-dependent apps any longer than C or anything is. Actually, given the character of the toolchain, it’s probably less dependent than others. Complex in a very large high-level program.
* It is used for platform-specific applications commonly.
* For a specific OS or platform, the library set is typically chosen that locks.

(Geeks For Geeks, 2021)

Think about the user-focused portion of the grocery-tracking program you completed using C++. What control does this give you over the user interface?

C++ is excellent choice for writing and developing GUIs. Maintainability is an asset that cannot be ignored Probably speed, but with such a small program or gains are minimal.

How does it allow you to use colors or formatting effectively?

I used colors in my console output. I imported *Windows.h* and called *system("Color 0B").*

The colors are assigned from windows (background, foreground). I attempted formatting but did not have much luck.

Explain the benefits and drawbacks of using Python in a coding project.

**Advantages of Python**

* Easy to Read, Learn and Write - Python is a high-level programming language that has English-like syntax. This makes it easier to read and understand the code. Python is really easy to pick up and learn, that is why a lot of people recommend Python to beginners. You need less lines of code to perform the same task as compared to other major languages like C/C++ and Java.
* Improved Productivity - Python is a very productive language. Due to the simplicity of Python, developers can focus on solving the problem. They don’t need to spend too much time in understanding the syntax or behavior of the programming language. You write less code and get more things done.
* Interpreted Language- Python is an interpreted language which means that Python directly executes the code line by line. In case of any error, it stops further execution and reports back the error which has occurred. Python shows only one error even if the program has multiple errors. This makes debugging easier.
* Dynamically Typed - Python doesn’t know the type of variable until we run the code. It automatically assigns the data type during execution. The programmer doesn’t need to worry about declaring variables and their data types.
* Free and Open-Source - Python comes under the OSI approved open-source license. This makes it free to use and distribute. You can download the source code, modify it and even distribute your version of Python. This is useful for organizations that want to modify some specific behavior and use their version for development.
* Vast Libraries Support - The standard library of Python is a huge, you can find almost all the functions needed for your task. So, you don’t have to depend on external libraries. But even if you do, a Python package manager (pip) makes things easier to import other great packages from the Python package index (PyPi). It consists of over 200,000 packages.
* 7. Portability - In many languages like C/C++, you need to change your code to run the program on different platforms. That is not the same with Python. You only write once and run it anywhere. However, you should be careful not to include any system-dependent features.

**Disadvantages of Python**

* Slow Speed

We discussed above that Python is an interpreted language and dynamically-typed language. The line by line execution of code often leads to slow execution. The dynamic nature of Python is also responsible for the slow speed of Python because does extra work while executing code. So, Python is not used for purposes where speed is an important aspect of the project.

* Not Memory Efficient - To provide simplicity to the developer, Python has to do a little tradeoff. The Python programming language uses a large amount of memory. This can be a disadvantage while building applications when we prefer memory optimization.
* Weak in Mobile Computing - Python is generally used in server-side programming. We don’t get to see Python on the client-side or mobile applications because of the following reasons. Python is not memory efficient and it has slow processing power as compared to other languages.
* Database Access - Programming in Python is easy and stress-free. But when we are interacting with the database, it lacks behind. The Python’s database access layer is primitive and underdeveloped in comparison to the popular technologies like JDBC and ODBC. Huge enterprises need smooth interaction of complex legacy data and Python is thus rarely used in enterprises.
* Runtime Errors - As we know Python is a dynamically typed language so the data type of a variable can change anytime. A variable containing integer number may hold a string in the future, which can lead to Runtime Errors. Therefore Python programmers need to perform thorough testing of the applications.
* Summary - Python is a simple, versatile and a complete programming language. It is a great choice for beginners up to professionals. Although it has some disadvantages, we can observe that the advantages exceed the disadvantages. Even Google has made Python one of its primary programming languages.

(Techvidvan, 2021)

Think about the analysis portions of the grocery-tracking program you completed using Python. How does Python allow you to deal with regular expressions?

I did not use regular expressions much in my version of the program. However, I have used regular expression with Python in the past with no problems to speak of.

How is Python able to work through large amounts of data? What makes it efficient for this process?

Python is the best programming language to manage Big Data because of its capacity for statistical analysis and its easy readability. Well, there are many more reasons that contribute to the success of Python. One of these is its library support for data science and analytics. Many top companies such as Google, Facebook, Mozilla, Quora, etc. use Python for managing their data. But let’s study all these reasons in detail to understand the popularity of Python and its astounding growth rate in Big Data Analytics. (GeeksforGeeks. 2020).

Discuss when two or more coding languages can effectively be combined in a project. Think about how C++ and Python’s different functions were able to support one another in the overall grocery-tracking program. How do the two function well together?

Two languages may be used in tandem to evercome other’s shortcomings. For example, C++ does nice GUI and user interfaces, whereas Python can open read and statistically analyze a file very efficiently. By calling the completed function output from Python into C++. Well, it worked fine and this is just a myopic comment of what is capable by using the assets of two different languages to accomplish one’s desires.

Then, consider what would happen if you added in a third language or switched Python or C++ for something else. In past courses, you have worked with Java as a possible example. What could another language add that would be unique or interesting?

This is difficult for me to answer. Because I am not experienced enough in any of the languages to really consider pairing them together. I enjoy pondering the concept. I look forward to doing much more of this sort of thing in the future. I would be looking more for advantages and disadvantages of the languages in larger projects.

Could it help you do something more effectively or efficiently in the grocery-tracking program?

Again, I would prefer to use just one language for the grocery project. On a small scale this would be no problem for any of the languages I am familiar with.

**References**

10 reasons why you should choose Python for Big Data. GeeksforGeeks. (2020, May 2). Retrieved October 17, 2021, from

https://www.geeksforgeeks.org/10-reasons-why-you-should-choose-python-for-big-data/.

Advantages and disadvantages of C++. GeeksforGeeks. (2021, July 5). Retrieved October 17, 2021, from

<https://www.geeksforgeeks.org/advantages-and-disadvantages-of-c/>.

Python advantages and disadvantages - step in the right direction. TechVidvan. (2021, September 28). Retrieved October 17, 2021, from

<https://techvidvan.com/tutorials/python-advantages-and-disadvantages/>.