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## Reflection on the Programming Language: Python

For this project, I used Python because it is a popular programming language known for its readability and simplicity. Pythons flexibility makes it widely used across various fields such as web development, data science, and scripting. This reflection will discuss Python's heritage and philosophy, the platforms and tools used, and its strengths and weaknesses.

### Heritage

Python was created by Guido van Rossum in the late 1980s and released in 1991. It was developed to be a simple and easy-to-understand language, inspired by the ABC language. Over the years, Python has grown and was supported by an active open-source community and the Python Software Foundation. Today, it's one of the most widely used languages known for its versatility and simplicity (Python Software Foundation, n.d.).

### Philosophy

Pythons philosophy centres on readability and simplicity guided by “The Zen of Python.” Key ideas include “Readability counts” and “There should be one and preferably only one obvious way to do it” (van Rossum, 1999). Pythons clean syntax helps developers write clear code and it supports multiple paradigms (like object-oriented and functional programming) making it adaptable to different types of projects.

### Platforms

Python runs on major operating systems like Windows, macOS, and Linux. It’s widely used in areas like web development, data science, and desktop applications. In this project, I used Python for data analysis and visualization where it’s especially popular.

### Libraries and IDEs

Python has a rich ecosystem of libraries. And in this project, I used pandas for data manipulation and matplotlib for creating graphs. These libraries made it easy to work with data in a visual way (McKinney, 2010). I used Visual Studio Code (VS Code) as my IDE because it supports Python well and has features like debugging and extensions for easier coding. PyCharm is another powerful Python IDE known for its advanced code completion, but I found VS Code more flexible for this project (JetBrains, n.d.).

### Characteristics

Python is known for its clean, readable syntax which makes it easy to learn and use. It’s an interpreted language so it runs code line-by-line which is helpful for testing and debugging. Python also supports different programming styles like object-oriented, procedural, and functional programming (Python Software Foundation, n.d.).

### Strengths

Python is praised for its simplicity and readability making it great for beginners but also powerful enough for complex projects. Its huge standard library and third-party packages allow developers to find tools for nearly any task from data analysis to machine learning. Pythons active community also provides lots of support, making it easier to learn and find solutions (Redmond, 2014).

### Weaknesses

Pythons main drawback is its performance. Being an interpreted language, it’s slower than compiled languages like C++. This can be a problem for high-performance applications. Also, Pythons dynamic typing can sometimes lead to runtime errors, which can be tricky in large projects if types are not handled carefully (Python Software Foundation, n.d.).

In conclusion, Pythons focus on readability and ease of use makes it a popular language for many applications, from data science to web development. While it has limitations, especially in performance, its strengths, such as extensive libraries and a large community, make it a valuable tool. This project showed me how powerful Python can be for data analysis and visualization, reinforcing its reputation as a versatile programming language.

References

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