Memo

To: UW Bothell Programmers

From: Nik Antoun ***NA***

Date: April 25, 2020

Subject: Choosing a programming language

Introduction

Finding the best suitable object-oriented programming language may be challenging, even for a UW Bothell programmer, because each language has its own strengths and weaknesses. In this memo, we will look into Java, C++, Python, and Visual Basic to determine which of the listed languages is the most essential for you to know. Table 1 compares the four programming languages with their technical aspects, platform support, and their most common practices.

Comparison

Table 1: Comparison of Java, C++, Python, and Visual Basic.

Criteria	Java [1]	C++ [2]	Python [3]	V.B. [4]
Software Development Environments (Most common)	→ Eclipse → BlueJ → IntelliJ → JGrasp → Android Studio → PyCharm	→ Eclipse → Visual Studio → NetBeans	→ Eclipse → Visual Studio → Spyder → PyCharm → Idle	→ Visual Studio
Platform Support	Windows, MacOS, Linux, Solaris		Windows, MacOS	
Specifications				
Typecasting	Typecasting is manual in Java, C++ and Python and is coded by the developer since all the variable types differ from each other in these languages.			Typecasting is automatic in Visual Basic.
Memory Management	Automatic through the Java Garbage Collector.	Memory management is active only during run time.	Python Memory Manager is automatic when a reference is no longer needed at run time.	Automatic through the .NET framework.
Garbage	Java garbage	Garbage	Garbage	Garbage

Collection	collection is completed through automatic memory management.	collection in C++ is not necessary since Pointers are used throughout the program.	collection is active when the program is executed and only activated when the variable/object reference is zero.	collection is not an automatic feature.
Scaffolding	Scaffolding is supported through all four of these programming languages.			
Common uses	→ Mobile app development → Game development → Desktop applications → Cloud-based applications → High-performance applications	→ Game development → Desktop applications → High-performance applications → Operating systems → Animation → Web browser design	→ Web development → Scripting → Automation	→ Windows apps only → Creating EXE files

SOURCES:

[1] ***Database 2 + Java's Developer's Guide*****. 2 Feburary 2012. 16 April 2020.**

[2] ***Uses of C++: 10 Reasons Why You Should Use C++*****. n.d. 17 April 2020.**

[3] ***Applications for Python*****. n.d. 16 April 2020.**

[4] Caputo, Linda. ***Getting Started with VBA in Office*****. 2019 August 2019. 15 April 2020.**

Conclusion

Choosing one of these four programming languages have each their own benefits and setbacks. Regardless of their technicalities and specifications, the most significant factor is the common application of a programming language.

- If you want to develop mobile apps, you should choose Java.
- If you want to develop games, you should choose either Java or C++.
- If you want to develop websites, you should choose Python.
- If you want to create cloud-based applications, you should choose Java.
- If you want to create high-performance applications, you should either choose Java or C++.
- If you want to create an operating system, you should choose C++.
- If you prefer a language that is best at scripting, you should choose Python.

- If you want to animate through programming, you should choose C++.
- If you want to design web browsers, you should choose C++.
- If you want to create EXE files, you should choose Visual Basic.
- If you prefer a programming language that is proficient at automation, you should choose Python.
- If you prefer efficient garbage collection, you should choose Java or Python.
- If you prefer the best memory management, you should choose Java.
- If you prefer automatic typecasting, you should choose Visual Basic.
- If you prefer to program on Linux or Solaris, you should choose either Java or C++.
- If you prefer to not use Visual Studio, you should choose Java.

Recommendation

Java and C++ have higher adoption than Python and Visual Basic since these languages are widely chosen by companies for building systems that require high-performance and cloud-based scalability. From my perspective, Java is my first-choice programming language due to the versatility, efficiency, and high demand for the skillset.

References

Applications for Python. n.d. 16 April 2020. <www.python.org/about/apps/>.

Caputo, Linda. *Getting Started with VBA in Office*. 2019 August 2019. 15 April 2020. <docs.microsoft.com/en-us/office/vba/library-reference/concepts/getting-started-with-vba-in-office>.

Database 2 + Java's Developer's Guide. 2 Feburary 2012. 16 April 2020. <docs.oracle.com/cd/B28359_01/appdev.111/b28765/introduction.htm#TDPJD101>.

Kenton, Will. *Understanding Visual Basic for Applications*. 5 February 2020. 14 April 2020. <w.investopedia.com/terms/v/visual-basic-for-applications-vba.asp.>.

Python Developer's Guide. n.d. 21 April 2020. <https://devguide.python.org>.

Team, Dataflair. *8 Astonishing Applications of Java*. 2020 February 2020. 15 April 2020. <data-flair.training/blogs/applications-of-java/>.

Uses of C++: 10 Reasons Why You Should Use C++. n.d. 17 April 2020. <www.educba.com/uses-of-c-plus-plus/>.

[word count: 564]