**Week3 Assignment Program I**

Hang Yang

IS 5103: Object Oriented Programming in JAVA

Prof. Abdalla Soliman

January 28, 2024

**Week3 Assignment Program I**

This essay provides a concise introduction to the program compilation process and specifically delves into the compilation process of Java (JAVA). To understand the JAVA compilation process, it's essential to first grasp the concept of a compiler—a specialized program designed to convert high-level, human-readable programming language source code into low-level, machine-executable machine code or bytecode (Sheldon, 2022). The significance of program compilation extends throughout the entire development lifecycle. It plays a pivotal role in advancing error checking before program execution and contributes to optimizing program performance through techniques such as constant folding, dead code elimination, and loop unrolling. JAVA, a widely used compiled programming language, exemplifies the compilation and execution process typical of many other compiled languages. Running a JAVA program involves two key steps: compilation and execution.

* The compilation step is to translate the source code .java file into bytecode .class file, including syntax checking, semantic analysis, and code optimization.
* The execution step means that JAVA Virtual Machine (JVM) runs the program by loading the .class bytecode file and executing the code blocks through the main entry of the program.

To provide a more detailed understanding, the entire JAVA compilation process can be illustrated through the following diagram:

Enter

.java

Process Annotation

Parse

.class

Generate

Desugar

Flow

Attribute

This diagram visually represents the sequential stages of the JAVA compilation process, emphasizing the transition from source code to bytecode and subsequent execution within the JVM.

Week3 Program I-1

A screen shot of a computer

Description automatically generated

*Note. Screenshot of Week3 Program I – part1. Own work.*

Week3 Program I-2

A screen shot of a computer

Description automatically generated

*Note. Screenshot of Week3 Program I – part1. Own work.*

Week3 Program I-3A screenshot of a computer

Description automatically generated

*Note. Screenshot of Week3 Program I – part1. Own work.*

Week3 Program I-4 Compiled Results of Outputs

A screenshot of a computer

Description automatically generated

*Note. Screenshot of Week3 Program I – part1. Own work.*

**References**

Sheldon, R.(2022). Compiler. [Blog Post]. Retrieved from <https://www.techtarget.com/whatis/definition/compiler#:~:text=A%20compiler%20is%20a%20special,as%20Java%20or%20C%2B%2B>

Tutorials Freak. (2024). Program Compilation in Java (How Java Programs Run and Execute?). [Blog post]. Retrieved from https://www.tutorialsfreak.com/java-tutorial/java-compilation