

New Java Machine Assembler

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Summary

The objective of this project is the development of a new Java Virtual Machine Assembler that provides a number of useful features, such as a more advanced error identification, the possibility to insert instrumentation instructions, the possibility to use symbols instead of numbers for local variables, and the possibility to assign symbols to local variables.

User Scenery

The project aims to provide the user with a more informative and accurate feedback representation when it comes to error handling.

```
.method public static mult(II)I
; set limits used by this method
.limit locals 4
.limit stack 2

iconst_0
istore_2
iconst_0
istore_3
loopy:
```

Given error
-wrong position
-no information
-misguides the user

The new version of the project informs the user of the correct position where the error was found as well as extra information about the origin of the error.

```
.method public static mult(II)I
; set limits used by this method
.limit locals 4
.limit stack 2

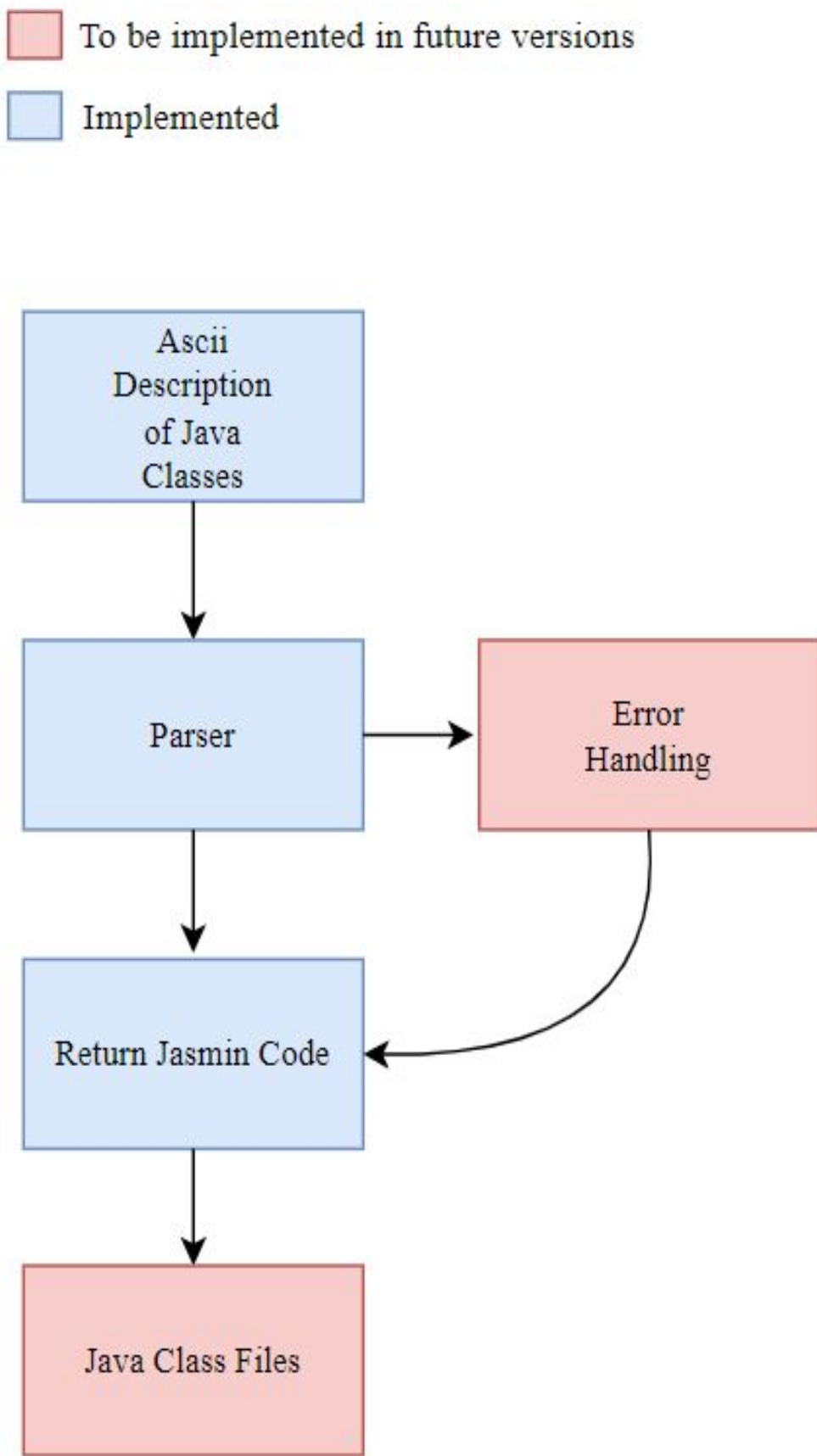
iconst_0
istore_2
iconst_0
istore_3
loopy:
```

New given error
-correct position
-more information
-easier to track

JVM Assembler

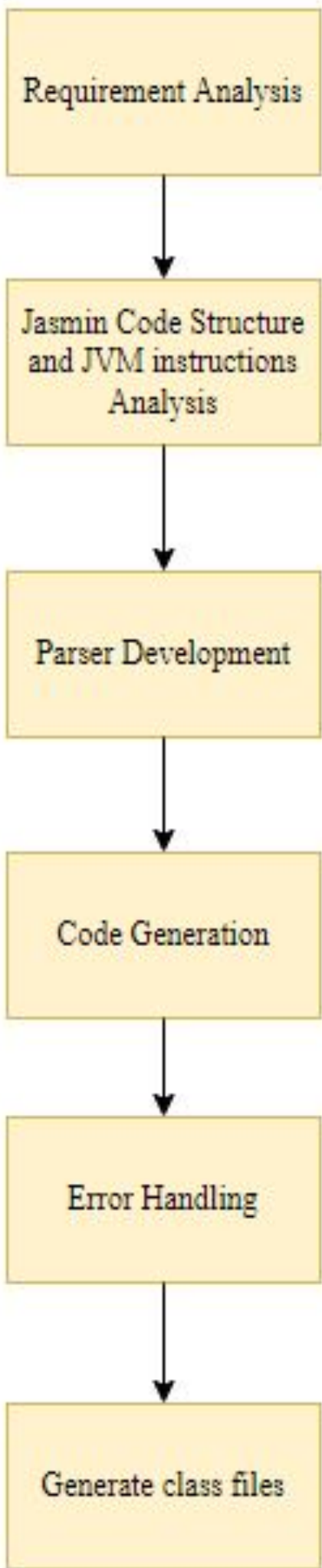
The Java Virtual Machine is the cornerstone of the Java platform. It is the component of the technology responsible for its hardware and operating system independence, the small size of its compiled code, and its ability to protect users from malicious programs. It is an abstract computing machine. Like a real computing machine, it has an instruction set and manipulates various memory areas at run time.

Project Block Diagram



Methodology

In terms of our methodology approach we aimed to divide the project in iterations, delineate a plan in a way we can sequentially do the tasks needed. The following diagram describes our ideal methodology in this project:



Conclusion

The main goal of this project was to build a new JVM Assembler, to make this possible we had to go through different phases of the project. We started by the development of a parser and ended with code generation. That said, we are still missing key functionalities to make this tool more useful. In conclusion, even with the missing part, we think that our project was successful, not only because we were able to show a good understanding of the JVM Assembler, Jasmin and JavaCC without prior experience, and also because we developed soft skills like team leading and organizing as a team.

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