

Project Information:

Our project name is Heap Heap Hooray, and our project will be to develop a garbage collector for the MiniJava compiler. This project will require us to deep-dive into garbage collector implementations, understanding and learning from them to write one that caters to the project's goals.

Our team consists of Tyler Gutowski (tgutowski2020@my.fit.edu), and Trevor Schiff (tschiff2020@my.fit.edu). Our advisor and client is Dr. Ryan Stansifer (ryan@fit.edu), a compiler researcher who has a deep understanding of the MiniJava compiler and Java runtime.

Throughout this milestone we finished the remaining GC implementation, and completed everything necessary for the showcase. This includes our poster board, manual, demo video, and ebook page.

Progress Matrix:

Task	Trevor	Tyler
Finish generational GC implementation	70	30
Conduct evaluation and analyze results	50	50
Create user/developer manual	50	50
Create demo video	30	70

Create poster board	30	70
Create ebook page	30	70

Discussion:

1. *Finish Generational GC Implementation:* The generational GC was mostly completed during the last milestone, but there were some bugs preventing us from testing the algorithm. Since then, we have ironed out the bugs and have written some test cases to demonstrate objects moving up through generations. Despite only having two generations (as opposed to three in popular implementations), we believe our implementation demonstrates the benefits of generational GC over copying GC: the ability to use both heaps to store live objects, and the reduced complexity of GC cycles.

2. *Conduct evaluation and analyze results:* Since quantitative results are difficult to resolve, we figured it would be better to use qualitative methods. Rather than comparing our garbage collector to other, more fleshed out ones, such as the Java Garbage Collector, we compared each of our algorithms to other algorithms, determining how each newly implemented algorithm fixes the previously implemented algorithm's downfall.

3. *Create user/developer manual:* Because our codebase is so complicated, it is difficult to cover all bases. We have the implementation with the compiler, the GC runtime, the heap runtime, and the Java test programs. We decided to give a "brief" overview of everything, while focusing on mostly the C runtime. Our developer manual is 20 pages though.

4. *Create demo video:* Our demo video is essentially just our test cases running. It is difficult to give a full overview of the process while maintaining viewer interest, so our best course of action is to make a secondary slideshow. Dr. Stansifer gave us the idea to split the slideshow into sections: one for a general overview, one for a more in-depth overview, and one for a deep-dive into how the software works. We will use this during the showcase, as a single poster/demo video cannot give enough information by itself.

5. *Create poster board*: Our poster board is relatively simple with lots of graphics. We figured it would be more enjoyable for the viewer to hear about our project through discussion, rather than reading a wall of text. We implemented lots of simple graphics that we can refer to.

6. *Create ebook page*: Our ebook page gives a brief overview of our project, in addition to each of the algorithms we implemented. We also included similar graphics to that on our poster.

Contributions:

Tyler Gutowski: I ran test cases to collect metrics for the showcase. I put together the showcase materials, including the ebook, poster, demo, and developer manual.

Trevor Schiff: I finished up the generational garbage collection, wrote some of the compiler-heavy stuff for the developer manual, and worked on the rest of the documentation.

Client Meetings:

See Faculty Advisor Meetings below

Client Feedback:

See Faculty Advisor Feedback below

Faculty Advisor Meetings:

We met on April 13th to discuss our progress on this last milestone, and review the display material we created for the showcase.

Faculty Advisor Feedback:

In email.

Approval from Faculty Advisor:

"I have discussed with the team and approve this project plan. I will evaluate the progress and assign a grade for each of the three milestones."

Signature: _____ Date: _____

Evaluation by Faculty Advisor:

Tyler Gutowski	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Trevor Schiff	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Signature: _____ Date: _____