`atoi` Proof of Correctness Report – Team 2

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I. Introduction

WE have been working on proving the formal correctness of the **atoi** function using Picinae on the ARMv8 architecture. This will help to advance the state-of-the-art and improve the Picinae system.

II. Overview of atoi

The **atoi** function takes a given input string, and converts the ”initial portion” of it into a corresponding 32-bit integer. The initial portion of a string starts from the beginning of the string and ends after the first numeric sequence in the string. Save for a ”+” or ”-” to indicate the sign of the numeric sequence in the string, only white space can intervene between the beginning of the string and the first numeric sequence in order to produce a ”valid” output. If this rule is violated, we call the input ”ill-formed”, and **atoi** will return **0**. Figure 1 shows a control flow graph for the disassembly of **atoi**.

III. Implementation Strategy

TODO

IV. Challenges

Throughout the course of our work on this project, we encountered a few challenges that made proving the correctness of **atoi** more complicated than originally anticipated. TODO

V. Breakdown of Contributions

- Matthew Sheldon TODO
- Isabella Pereira TODO
- Jarrod Rogers helped with organizing the project and wrote the majority of this report.
- Naja-Lee Habboush TODO
- Brandon Wang made the control flow graph (Figure 1) and TODO

VI. Future Work

TODO

VII. Conclusion

As a team we have learned a lot from working on the correctness for **atoi**. iEven though there is still more work to be done, we are proud of what we have accomplished and the work we have contributed towards advancing the state-of-the-art.

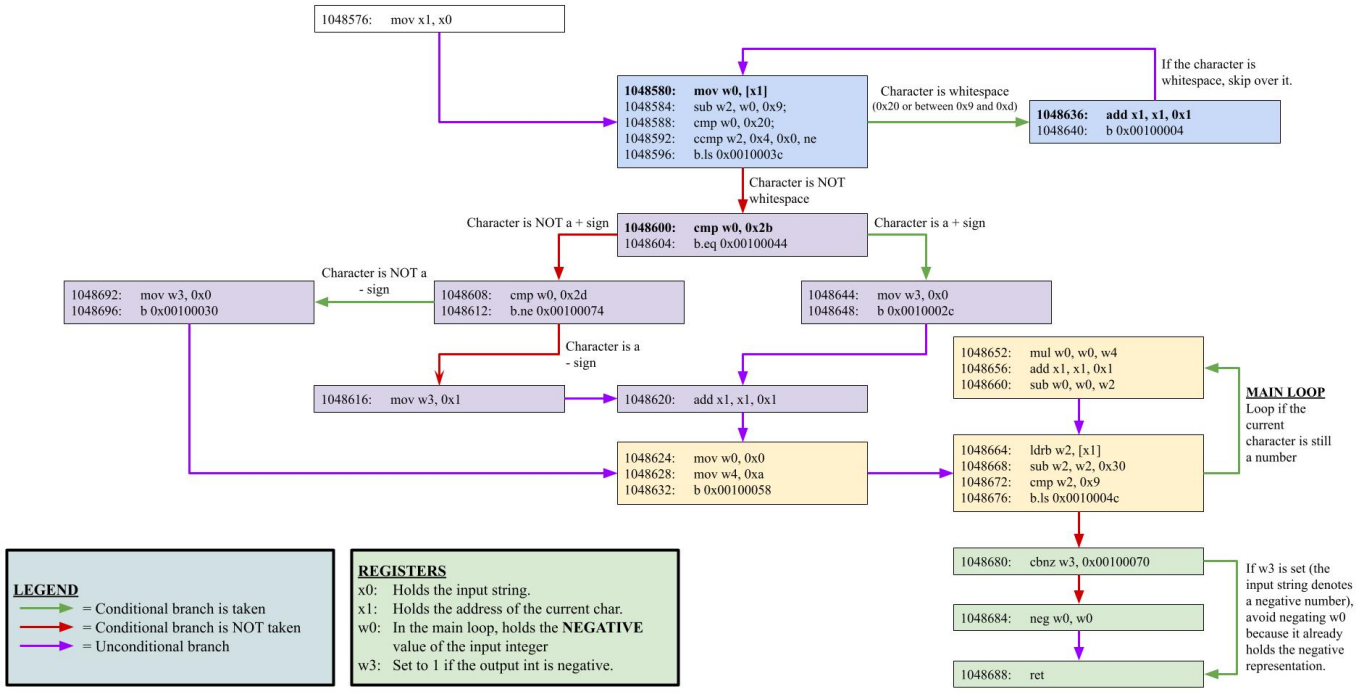

Fig. 1: atoi CFG