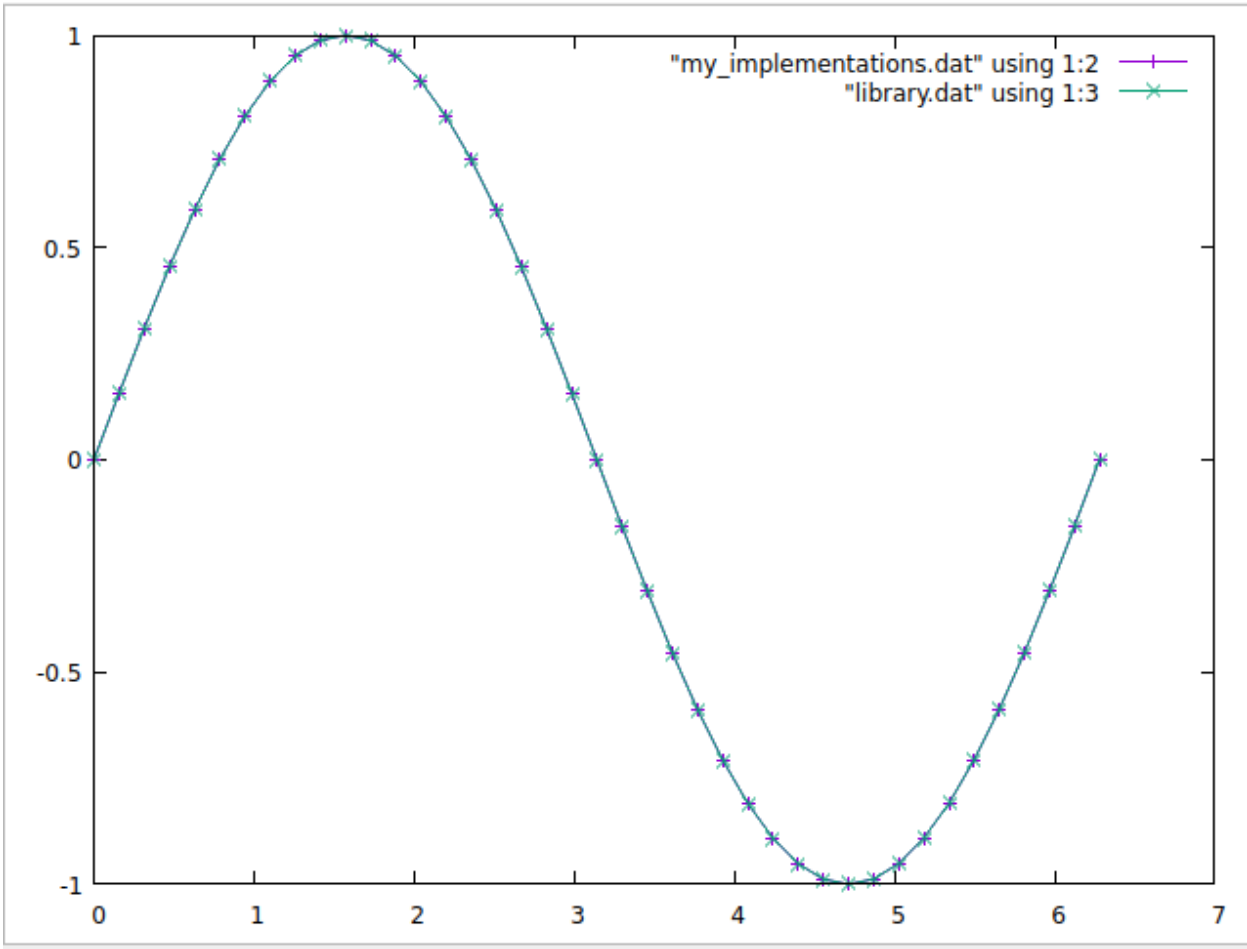
Vincent Siu
10/9/22

WRITEUP

In this document, I will explain the results of my function tests, and reasons there might be some differences between my implementations of the functions vs the standard library.

1. my_sin(x)



Graph 1: my_sin(x) vs. Library sin(x)

A. As seen in this graph, and also from the numerical results from the tests, the differences shown are very minor, being as high as 2^-12. In addition, although not shown on here, I have also made my_sin(x) work with negative values as well.

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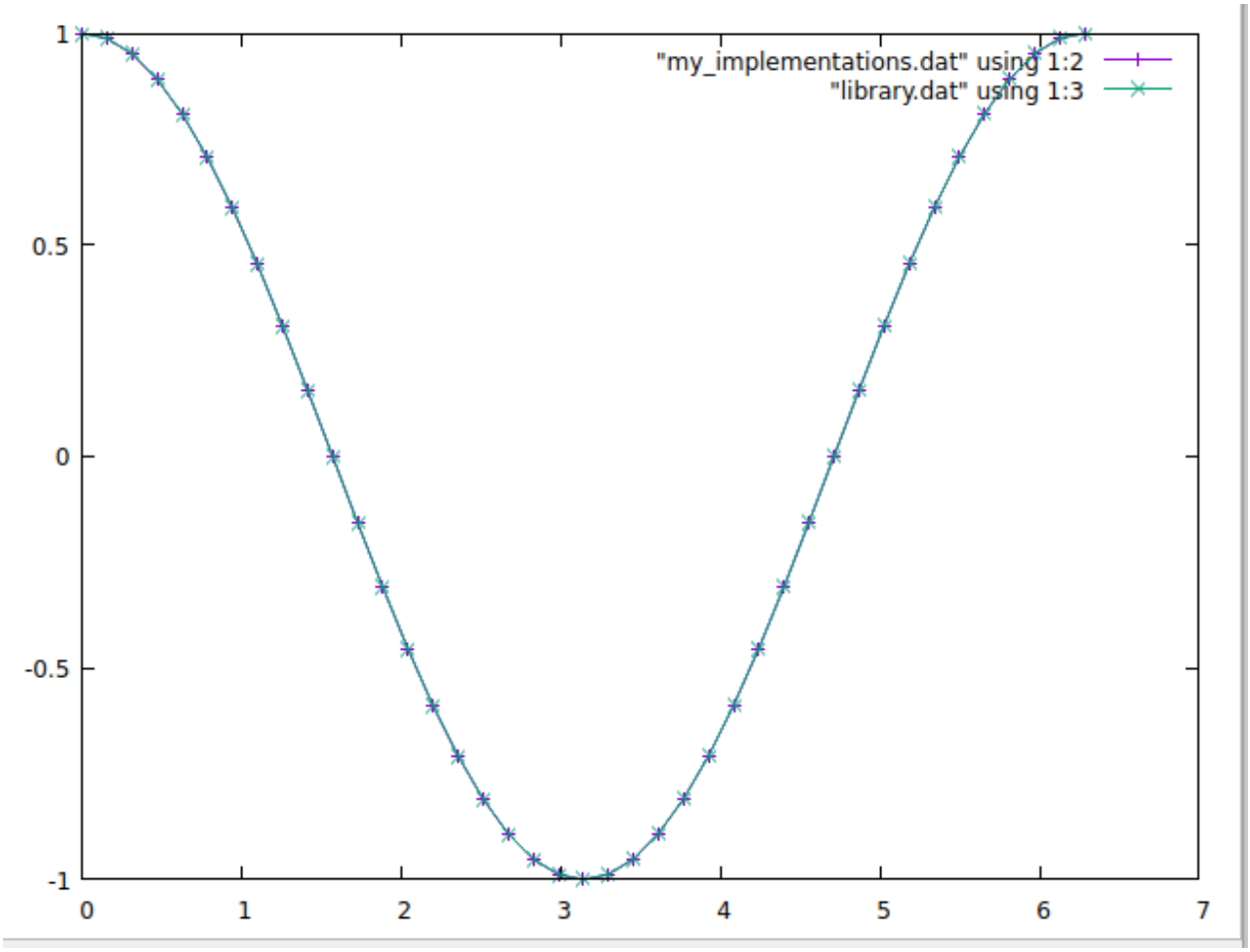
2. my_cos(x)



Graph 2: my_cos(x) vs. Library cos(x)

A. Like the previous graph, my current implementation of cos(x) outputs data to that of the library respective to the input. Numerical errors are also as high as 2^-12.

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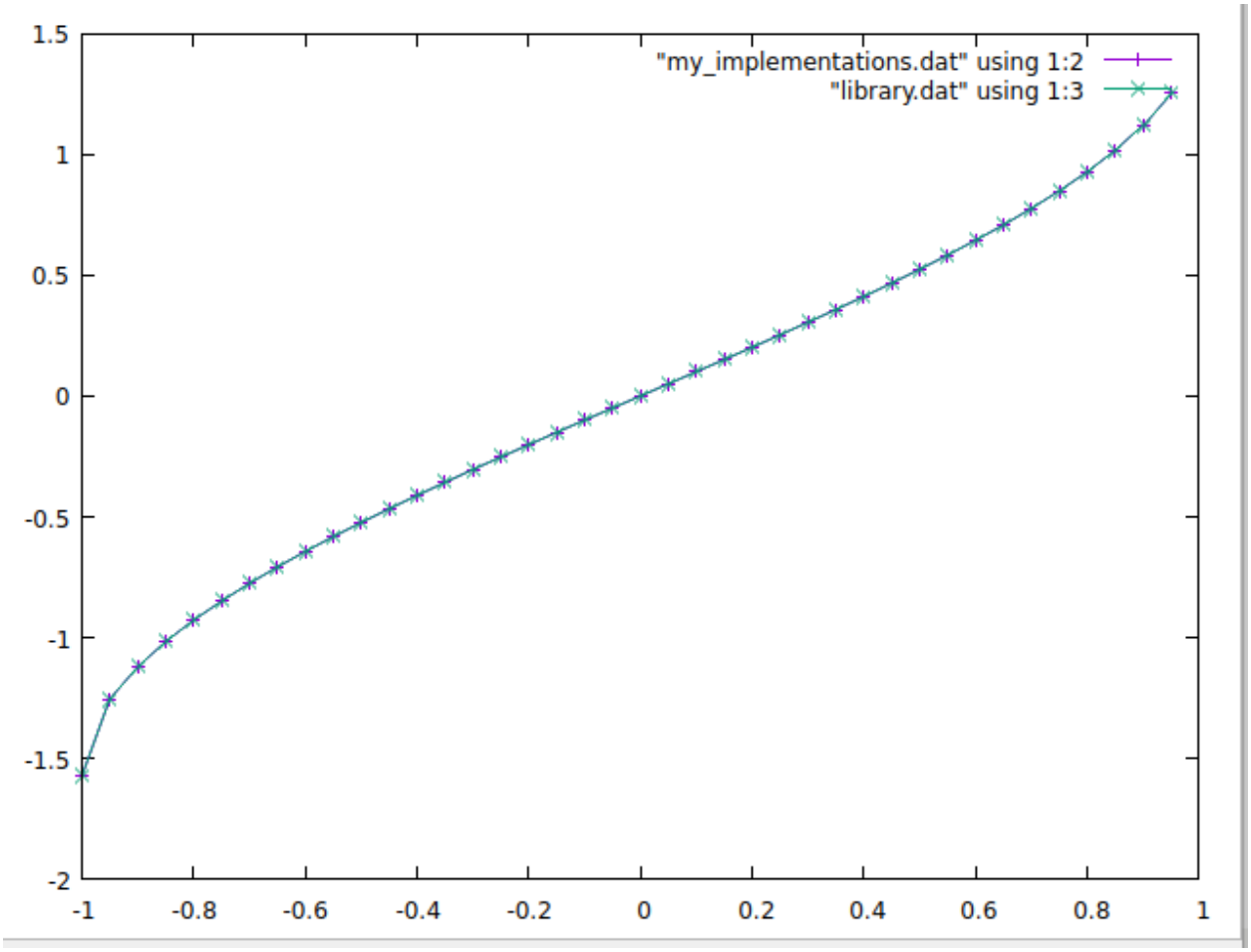
3. my_arcsin(x)



Graph 3: my_arcsin(x) vs. Library asin(x)

A. The biggest significant difference produced between my implementation and the library is when x = -1, being that it's 0.000000294767. The error could possibly be due to the ambiguity of the value z_0 because when adjusting the value, the error changes somewhat as well.

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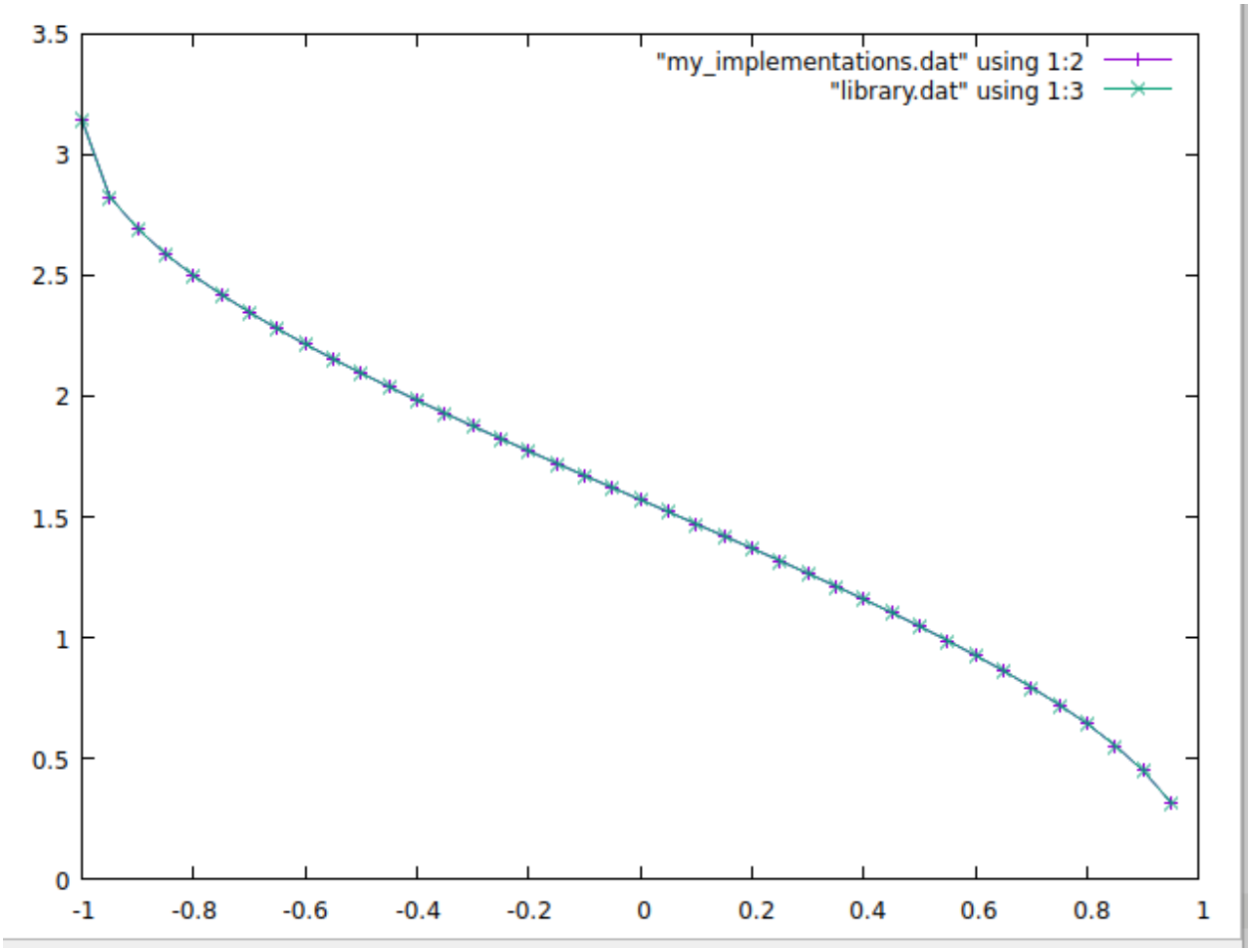
4. my_arccos(x)



Graph 4: my_arccos(x) vs. Library acos(x)

A. Like my implementations for arcsin(x), the biggest significant difference produced between my implementation and the library is when x = -1, being that it's -0.000000294767. Since this function is solely based on my_arcsin(x), the source of the error could be coming from that function.

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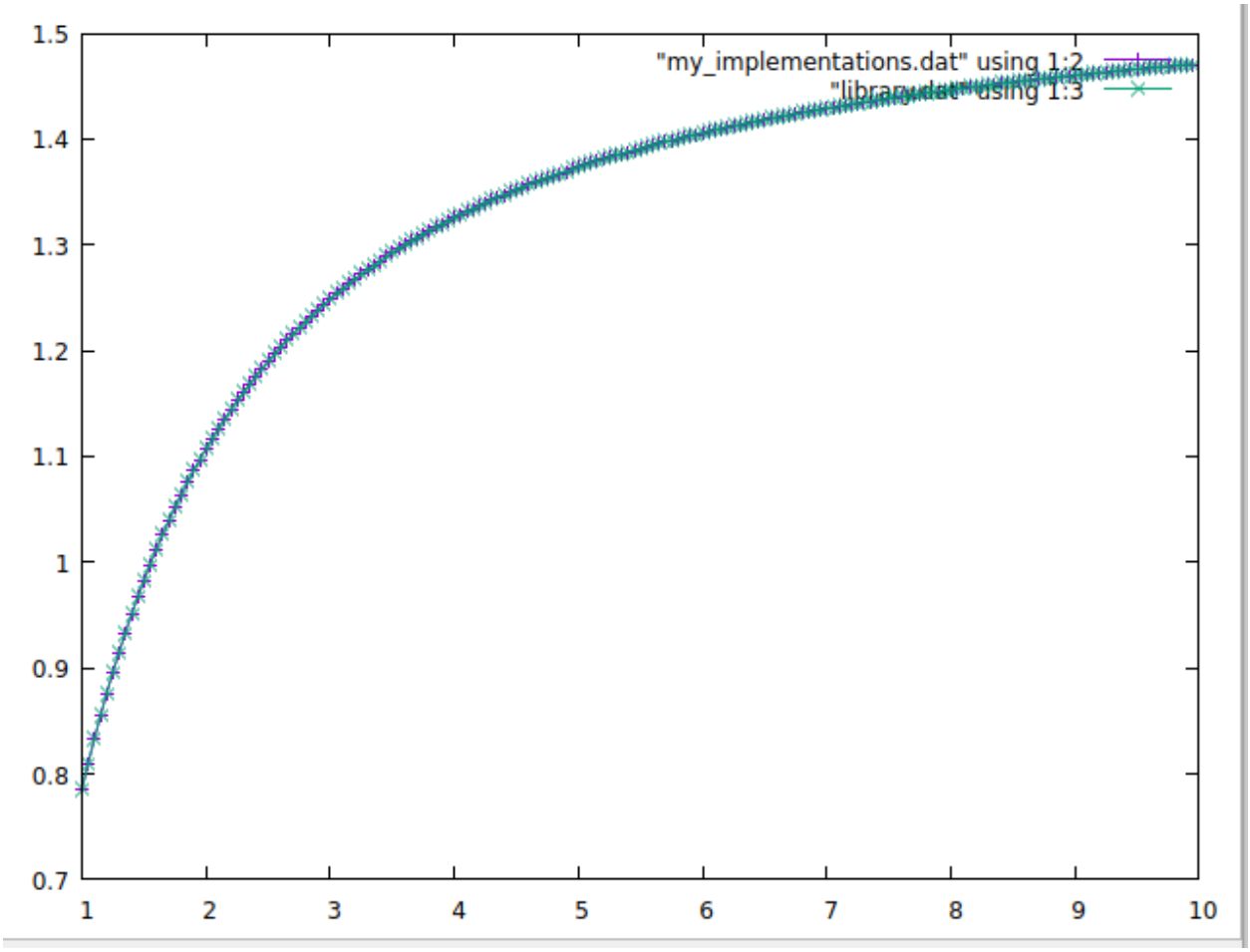
5. my_arctan(x)



Graph 4: my_arccos(x) vs. Library acos(x)

A. For all values of x, the differences can be seen at 10^-10, although the error may not be as significant. The errors are not very likely not based on the error from x=-1 as used on arcsin(x) since that value is not tested on this function. However, it can be due to the ambiguity of the initial value of Z from my_arcsin(x).

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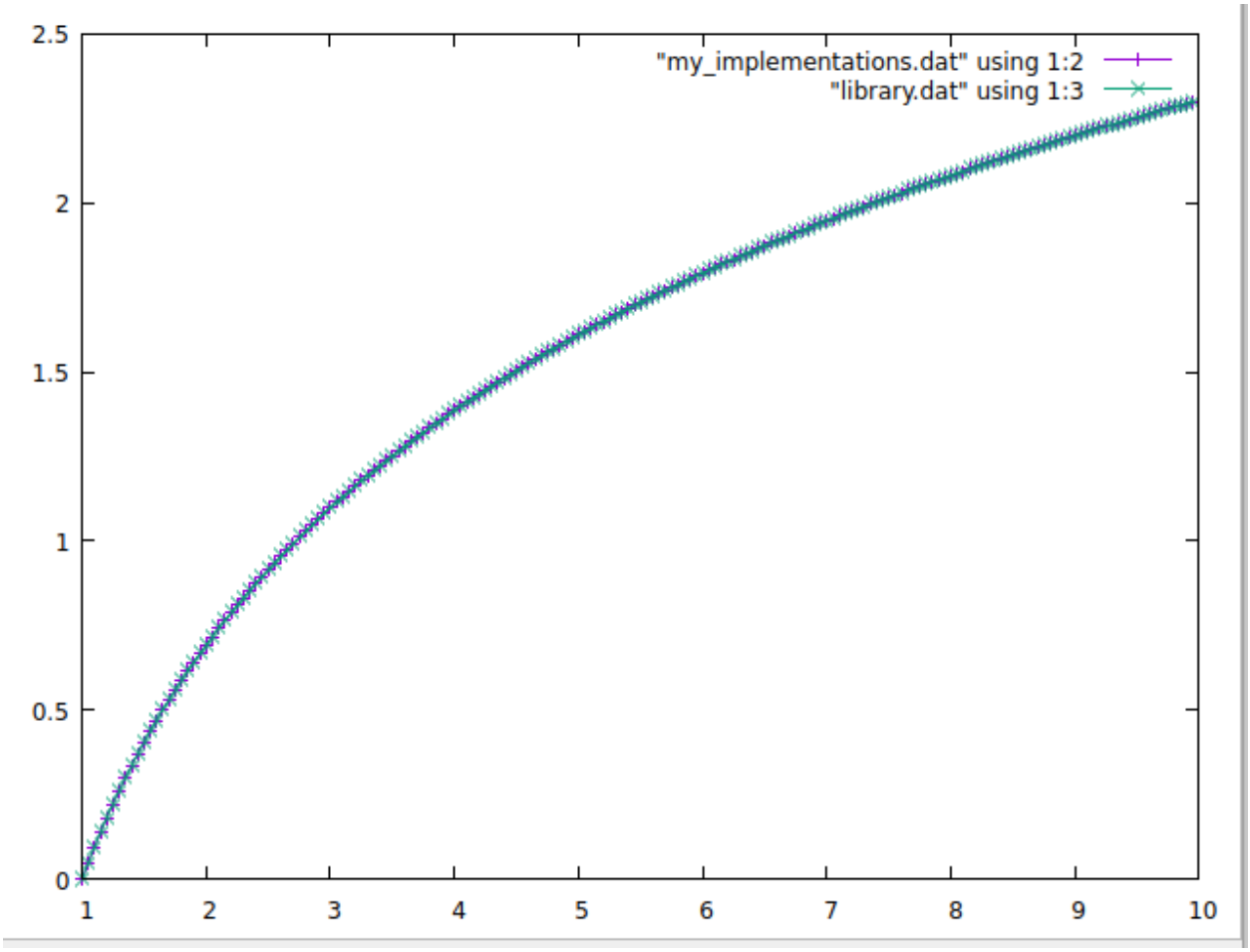
6. my_log(x)



Graph 6: my_log(x) vs. Library log(x)

A. Errors produced are very minimal, but when x is equal to 10, then my implementation of log starts infinitely looping and no value is produced. Errors, when shown numerically, can be as high as 2^-12.