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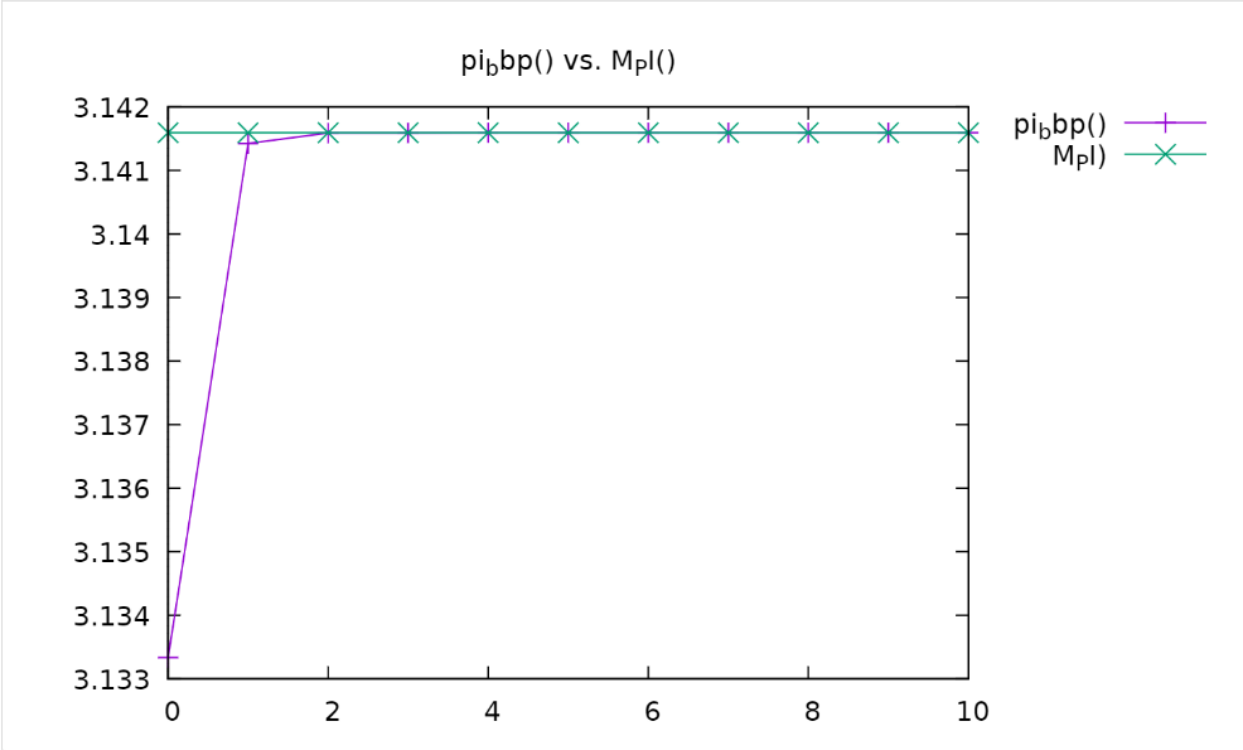
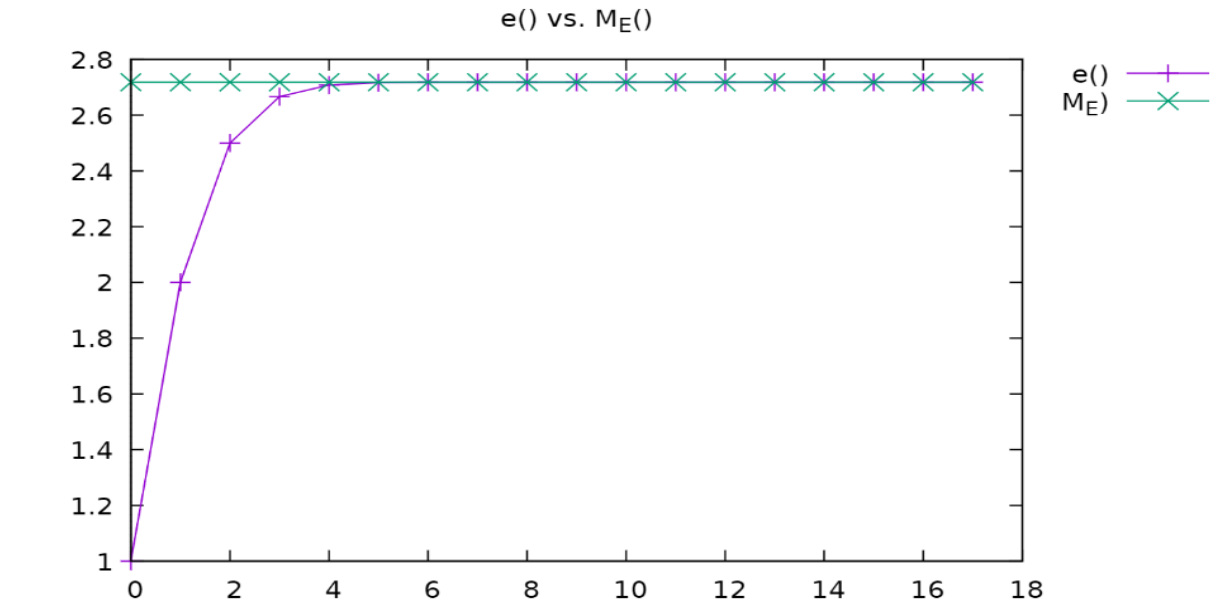
Professor Long
October 10, 2021
CSE 13S

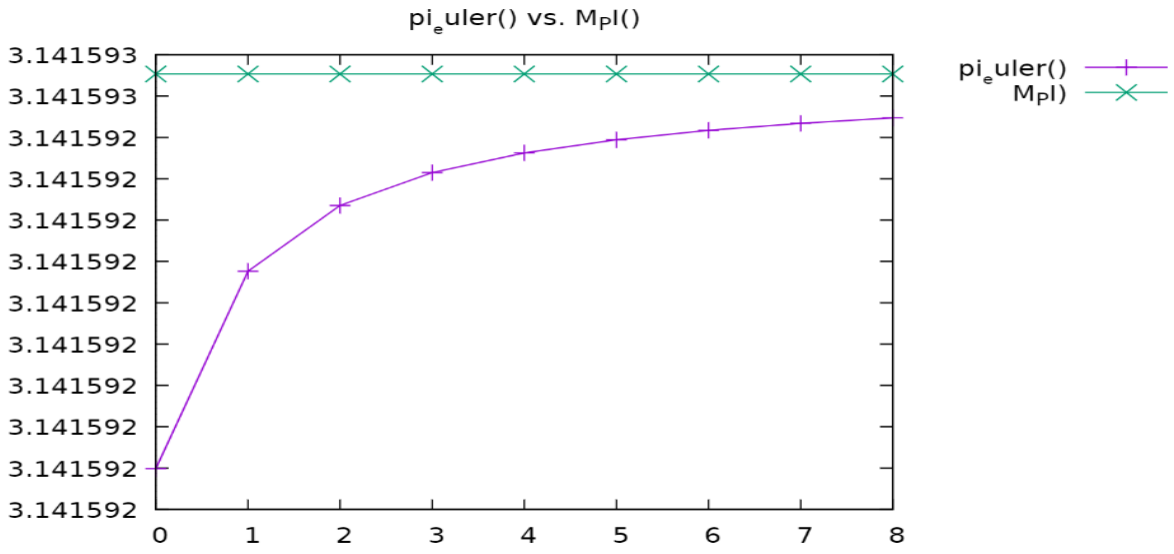
Write Up Assignment 2
A Little Slice of Pi



I think that this one wasn't necessarily accurate because there were so few computations because the iterations ended up being smaller than Epsilon too fast. There needs to be a more accurate way to represent Pi without reaching epsilon so quickly as you can tell by the steep slope of the line on the graph.

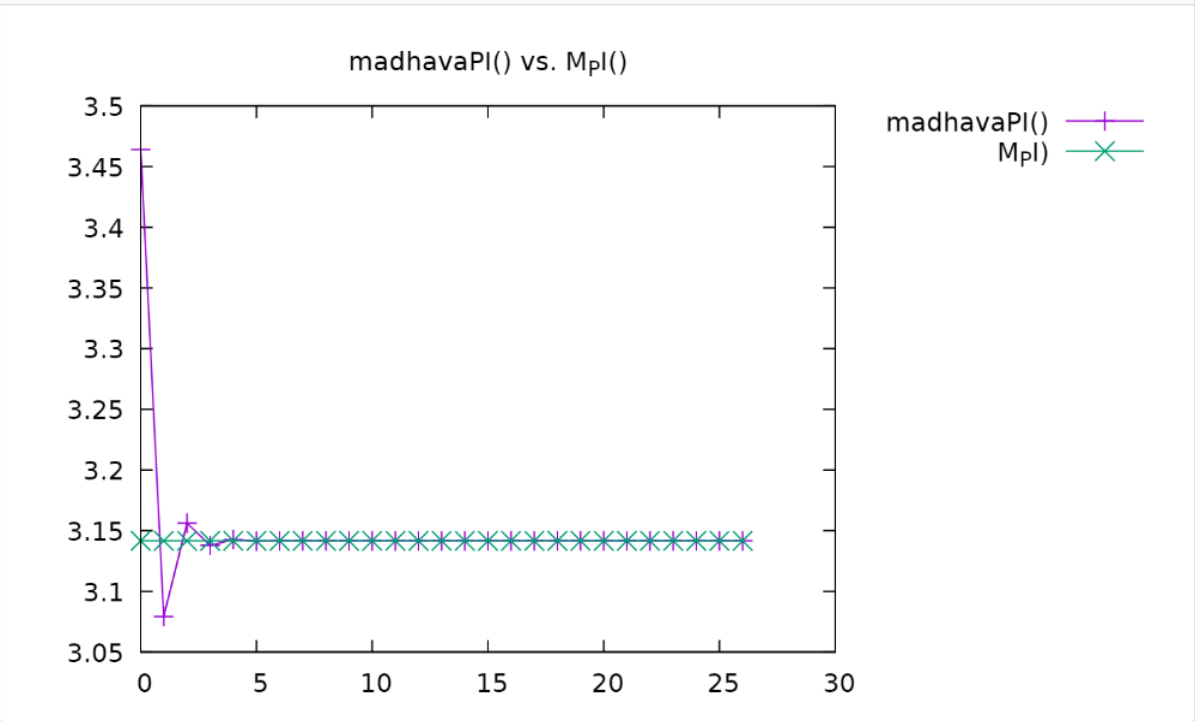


This one had similar issues as bbp() but it differs because this is comparing it to e while the other compares to pi. Like the other function, the iterations become smaller than Epsilon too fast shown by the graph once again.

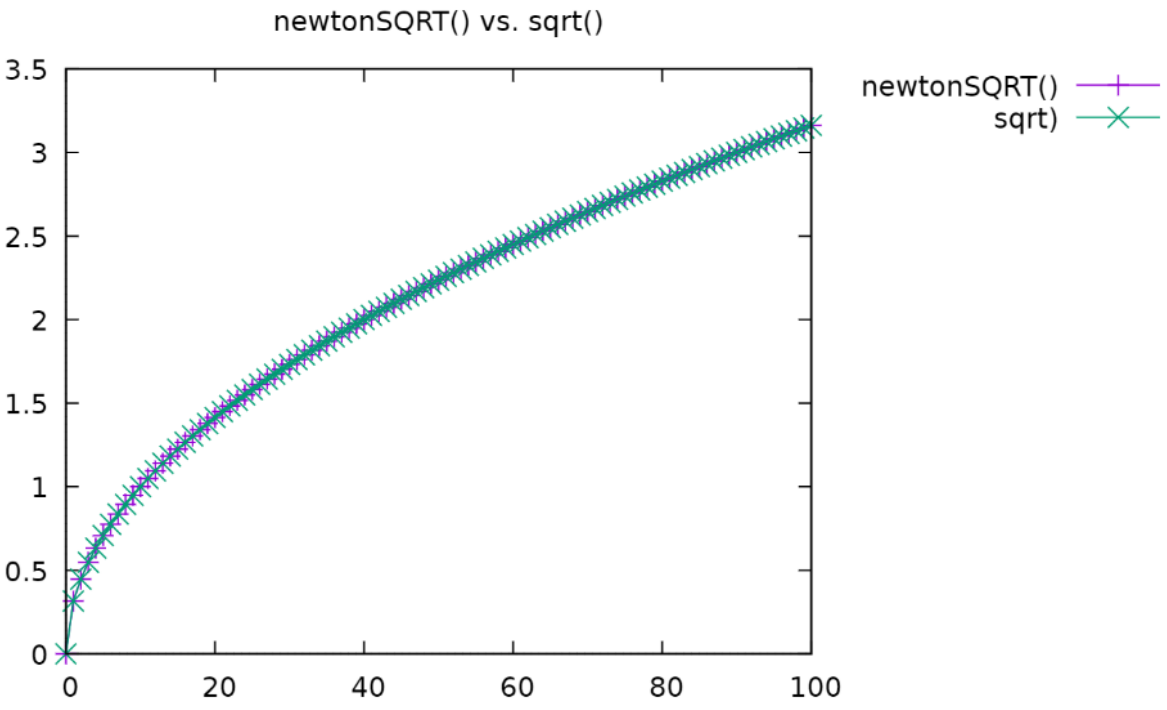


This one is one of the most accurate comparisons to pi because there were 10 million iterations of running through the summation. This means that since there was a bigger sample size, the comparison to pi is more accurate compared to the previous two graphs as they didn't even have over 15 iterations. Without even looking at the actual numbers produced, we can simply

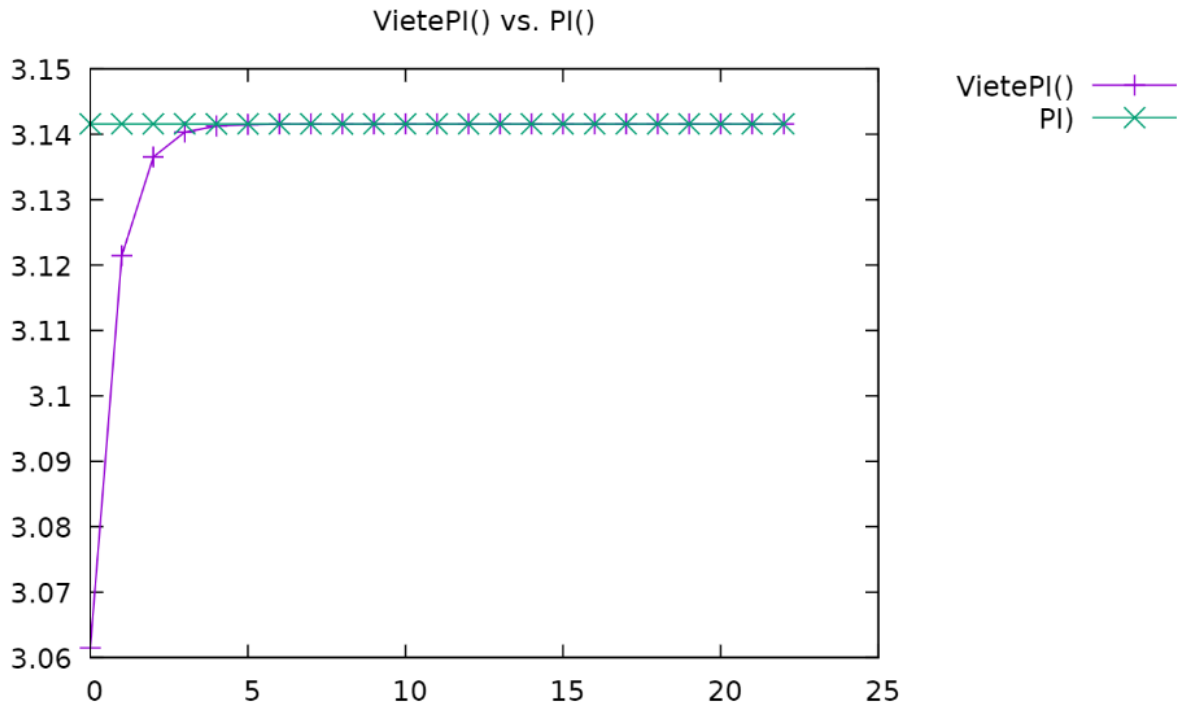
see from the graph that the slope is slower meaning that there had to have been more iterations of running through the summation before reaching epsilon.



We take note that this implements sqrt_newton in order to satisfy the formula which means that madhava is not exactly accurate because sqrt_newton by itself isn't even completely accurate. This one was more accurate than the first two functions, but not as much as the euler() which makes sense because madhava had more computations than the first two but less than the euler function.



As you can clearly see, our program is pretty similar to the actual sqrt function beside the first point because 0 is an oddity when it comes to math. I think that this is because the formula we used just accurately calculates the square root of any number.



This one, like madhava, uses sqrt_newton and like I said before, it's not 100% accurate even though we saw in the previous graph that it's pretty close. However, this one even though it had not quite a lot of iterations, was pretty accurate based on the mathematical formula. My viete was more accurate than the example code provided because I had more iterations so I was close to the actual Pi number. After looking at all the graphs and recording all the iterations, I do think that accuracy increases as there are more iterations.