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ISC 4232 Lab 4 Report
Prof. Quaife Fall 2020

Lab 4 Report

Figure for 4.1

Note: The exact solution and the approximate solution overlapped almost perfectly, so the linewidths of the exact and approximate solution were changed s.t the approximate solution is over the exact.

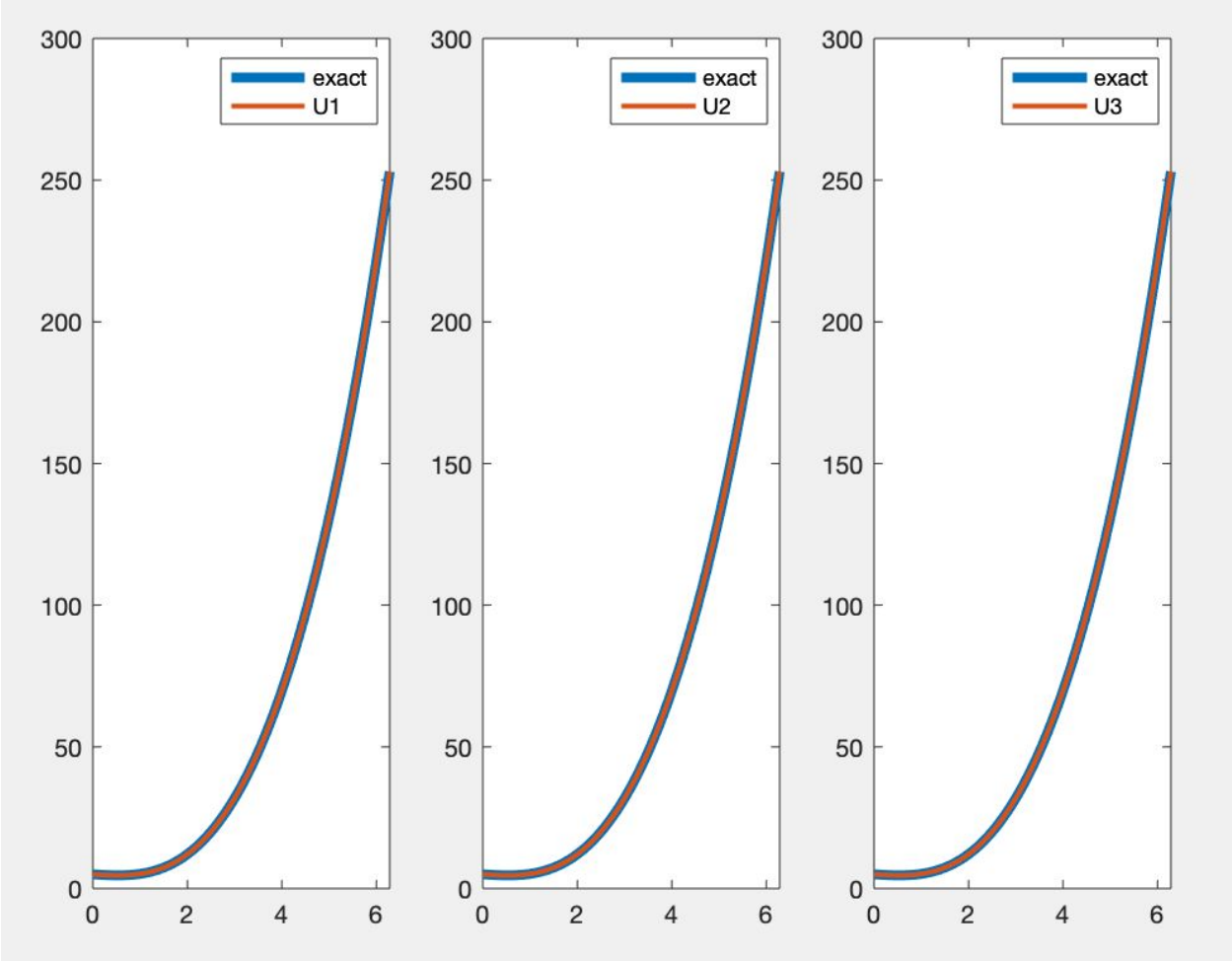
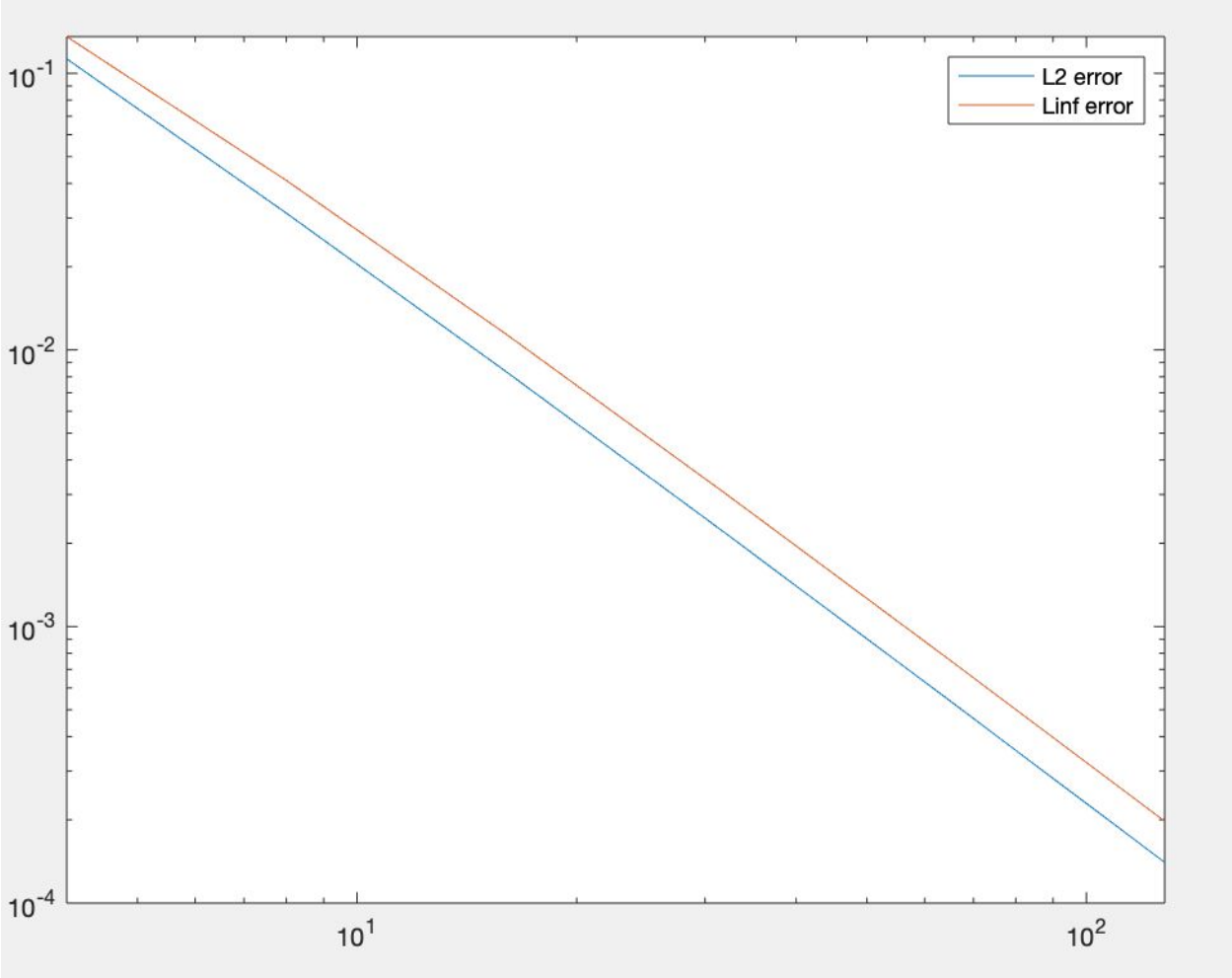
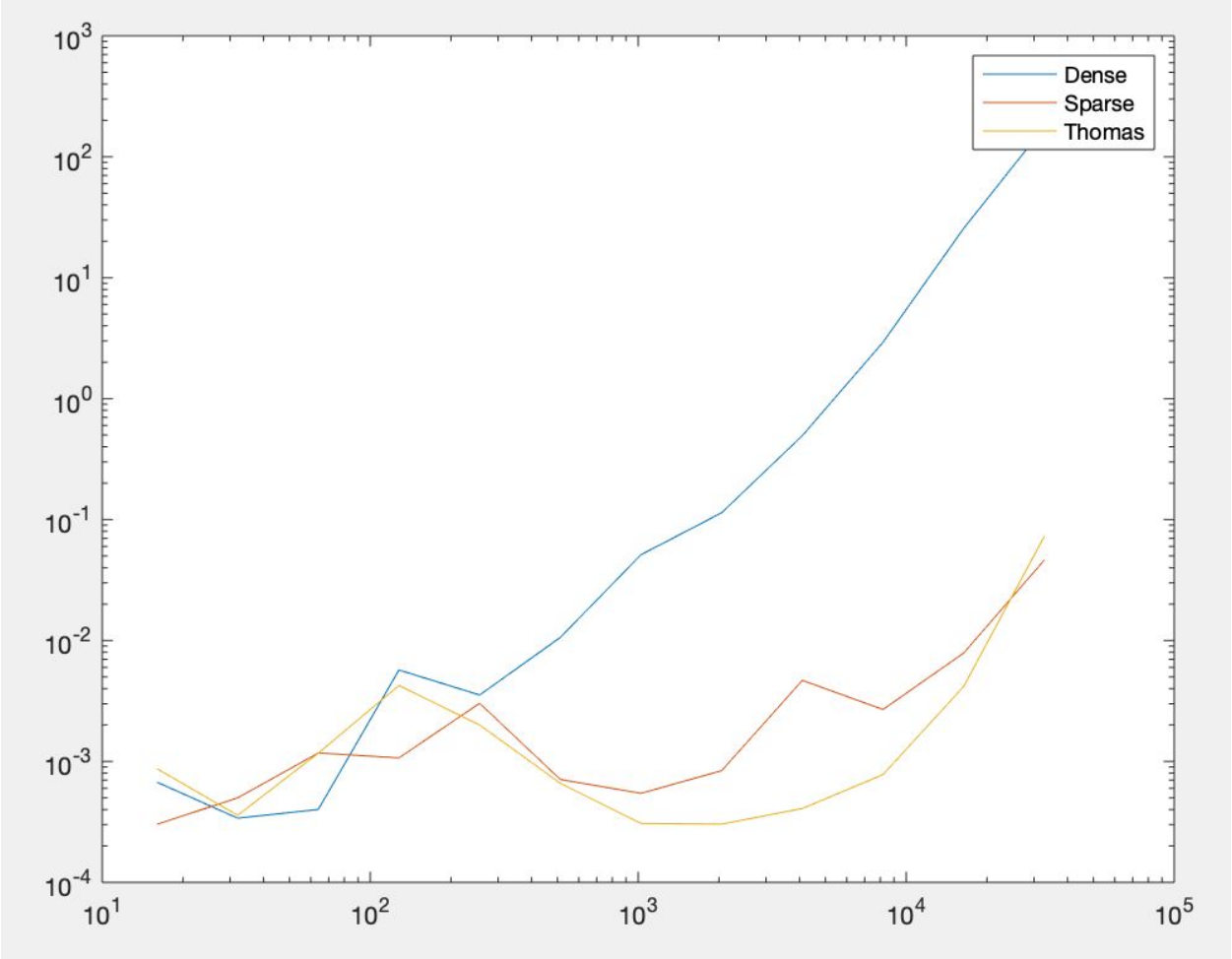


Figure for 5.1



Convergence study: Since the error goes down by a factor of four when the discretization points are increased by a factor of two, the convergence of the centered-difference stencil method is of the order O(n^2).

Figure for 6.1



The CPU time as N increases is what I expected it to be. For the dense method which requires O(n^3) operations, the CPU time is much higher, and on the loglog, the slope appears to be 3 times the amount of the times for the sparse and thomas methods. I also expected the sparse and thomas times to be similar, and they are.