EE 789 Assignment 3

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1. The Newton-Raphson method has been used to approximate the reciprocal of the number. In Floating point standard, a number is represented as $x * 2^y$. For my initial guess, I have taken the guess $x * 2^{-y}$.
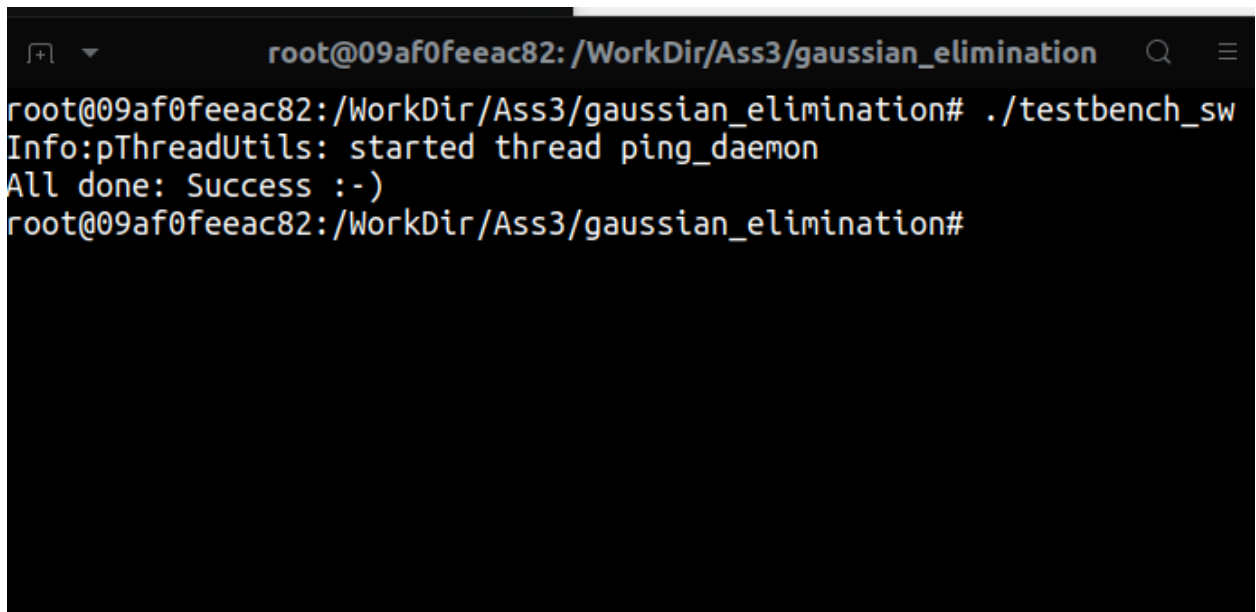

Divider Testbench verification

Iterations of the divider have been fixed to 8 iterations. I have verified that the accuracy is okay for this number. Total number of cycles is

Number of clock cycles = 8 * (2 * multiplication + 1 * subtraction) = 24 floating point operations.

All multiplications and subtractions are floating point

2. Gaussian elimination has been implemented in the standard way. It uses floating reciprocal for division. Input arrives from pipes and is filled in the matrix. The module run_test then runs Gaussian Elimination and stores the result which is returned via an output pipe.


```
root@09af0feeac82: /WorkDir/Ass3/gaussian_elimination                    Q    ≡
root@09af0feeac82:/WorkDir/Ass3/gaussian_elimination# ./testbench_sw
Info:pThreadUtils: started thread ping_daemon
All done: Success :-)
root@09af0feeac82:/WorkDir/Ass3/gaussian_elimination#
```

Gaussian Elimination testbench verification

Gaussian elimination runs for $O(n^3)$ iterations. Total floating point operations are

OP = n^2 * 24 + n^3 * (multiplication + subtraction) + n * 24
    = $2n^3 + 24n^2 + 24n$

Where n = 16 for this assignment