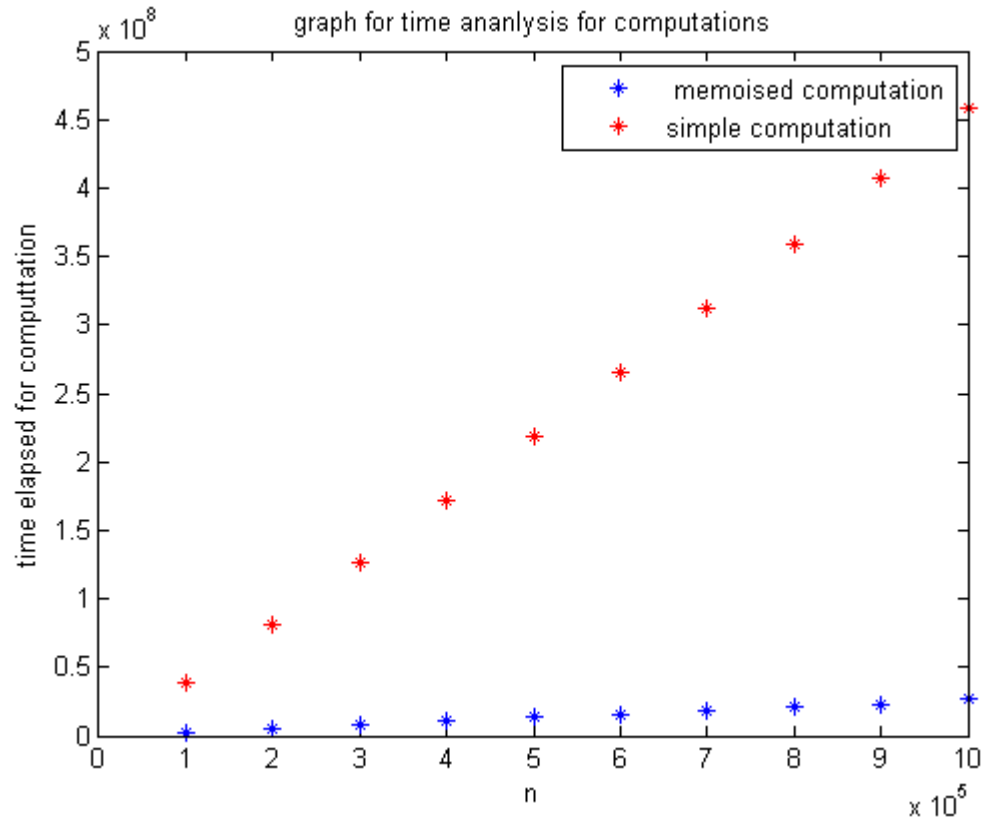


README: Assignment 1
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Course: CIT 594 (Spring 2015)

A) The readings obtained from doTimings:

n = 100000; simpleCompute 38462330 ns, memoisedCompute 2919210 ns.
n = 200000; simpleCompute 81672451 ns, memoisedCompute 5178444 ns.
n = 300000; simpleCompute 126494984 ns, memoisedCompute 7790594 ns.
n = 400000; simpleCompute 172086709 ns, memoisedCompute 10625075 ns.
n = 500000; simpleCompute 218315112 ns, memoisedCompute 13235155 ns.
n = 600000; simpleCompute 265250447 ns, memoisedCompute 15941688 ns.
n = 700000; simpleCompute 311600212 ns, memoisedCompute 17990594 ns.
n = 800000; simpleCompute 358757497 ns, memoisedCompute 21058060 ns.
n = 900000; simpleCompute 407728377 ns, memoisedCompute 23388012 ns.
n = 1000000; simpleCompute 458142249 ns, memoisedCompute 26419957 ns.

The Graph for a comparison between the memoised and simple computations for the calculation of the lengths of collatz sequence for 100000 to 1000000 numbers is as follows:



In the above graph the Blue stars represent memoised computations while the red ones signify otherwise. It is clear that memoised computations are faster than the simple computations. There is a direct relationship between timetaken for simple computation and the number 'n' for computing the Collatz sequence Length. Where as The relationship is is exponential in case of memoised computations. BigO time of memoised computataion seems to be $\log(n)$ and that of simple comuttation seems closser to n .

A guesstimate of the formula would be:

For memoised computation; time = $\log(n)$.

For simple computation; time = $K*n$ (where K is a constant)

B) Several interesting things about Collatz conjecture, the most interesting one was what Mathematician Paul Erd's said about the Collatz conjecture: "Mathematics may not be ready for such problems.". He also offered \$500 for its solution.

C) A method that I implemented for testing aspects of Collatz sequence was: Finding the common set of numbers in two different collatz sequences. There was no specific relationship. The sequences converging to multiples of two had an intersection of those numbers with each other.

D) I estimated it would take three days. I finished the assignment in 4 days.