

Problem 1 (10 pts) - Submit a report for this problem

An annuity is an account which you add money to at regular intervals. The future value of an annuity that accrues interest at a fixed rate is given by

$$FV = A \frac{(i + 1)^n - 1}{i},$$

where A is the amount you add, n is the number of payments made, and i is the interest rate. For example, if I invest \$100 per year at an annual interest rate of 10%, then after 15 years I will have $100 \frac{1.1^{15} - 1}{0.1} = \3177.25 and I will have paid \$1,500.

Assuming that you invest \$1,000 annually, how long will it take you to become a millionaire if you invest in the following:

- Savings account (assume yield 1.9% annually)
- CD account (assume yield 5% annually)
- Money market account (assume average yield 12% annually)

Also report the total investment you made in the annuity in each case.

Solve this problem *numerically* using either MATLAB **or** Excel. Also solve the problem using an *analytic solution* (hint: use the natural log function). Submit a brief report to summarize your findings. In your report, include a summary of the results as well as the derivation of your analytic solution. Also be sure to submit the MATLAB or Excel file you used to solve the problem.