CSCI3656: NUMERICAL COMPUTATION
Homework 12: Due Friday, Dec 4, 5:00pm

Turn in your own writeup that includes your code. List any resources you used including collaborating with others. You shouldn't need to use the symbolic toolbox. Submit a PDF on Canvas by Friday, Dec. 4 at 5pm.

1. Read this website about the The SIR Model fo Spread of Disease – The Differential Equation Model: `https://www.maa.org/press/periodicals/loci/joma/the-sir-model-for-spread-of-disease-the-differential-equation-model`

   Notice the figure at the bottom of the page showing the population trajectories. You're going to reproduce that figure.

2. Implement Euler's method for the SIR system. Find a stepsize h such that a plot of your Euler trajectories matches the website's figure. What value did you get for h, *and how did you get it*?

3. Repeat the previous problem with Runge-Kutta 2.

4. BONUS (20 points): Repeat the previous problem with Runge-Kutta 4.

5. BONUS (50 points): Design and run a convergence study with respect to h for both Runge-Kutta 2 and 4. Choose the range of h's informed by (i) the values you found in problems 3 and 4 and (ii) a goal to determine the asymptotic regime for RK2/4 applied to the SIR system. (This is such a good problem. This is the kind of problem you talk about in a job interview to demonstrate your deep knowledge of the subject.)