Using Exact Sciences Modeling Tools to Understand Social Phenomena

Course #: 55772

Exercise #6: The rise and Fall of Societies
Due: Wednesday June 27, 11:50 pm, on Moodle
The homework will be the basis for class discussion. No late submissions!

General Instructions:

- Unless stated otherwise, submission is done individually. We rely on trust. You may discuss assignments verbally, but do not share solutions with other students.
- You may use examples from the Internet, but use them as an inspiration and make them your own.
- Your homework should be submitted through Moodle. Please zip your files to ex_6_First_last.zip (with your first and last name). The zip should include: 1) a PDF document (no .docx and no jpg) with your responses, pseudo code, explanations, insights etc. 2) Your code files. Your code will not be tested, but we might use it as a reference in case we need clarifications. Please keep g ood coding standards, and document your code properly.
  You may use MatLab, Python, C/C++, or Java. If you want to use other programming language, please get our approval first.
- Please use proper language and correct grammar (Hebrew or English), explain clearly what you do, use graphs and charts if needed.
- No scanned handwritten works please.
- We respect the business etiquette: No late submission.

<u>Grading</u>
The homework grading will be based on the following parameters:

1. Correctness of the analytical response, clarity of presentation
2. Model compatibility: how does your model matches the description?
3. Implementation: Based on the pseudo-code (we might use the code if clarifications are needed).
4. Insights quality: Try to find non-trivial insights.
5. Creativity
6. Visualization: Your insights should pop-out of the figures you choose.

   Tips for visualization:

   - Label each figure
   - Explain each figure in the text
   - Label each axes + what are the units?
   - Clean figures: Avoid unnecessary details in figures.

Task 1: Find an alternative model to the rise and fall of societies problem

In class, we studied the sugarscape model to describe the rise and fall of societies. Obviously, this is one possible model out of many. Based on what we know about the phenomenon. We invite you to develop an alternative model. As always, be clear with your assumptions, parameters, and purpose. Be specific with the model and implement it, wither with code (do not forget to attach your pseudocode), or equations.
Find some cool new insights.
Remember – it does not have to be very broad or very complete, but it should teach us something new.
Be bold, creative, and intellectually courageous!