Scientific Investigations Using Computation: ICA 1 (In-Class Assessment)

(9 March 2023)

Name/Pledged_____

In class: No open notes, nor use of computer/web resources

After: Any resources you choose, including office hours. Submit as PDF by 6 pm Monday 13 March 2023

1. We have asserted since the first class that almost any description of modern science can be simplified down to three inter-related actions of the human person. What are they?

2. A model that has at least one element of randomness can be described as:

   _____

3. A model whose behavior depends solely on its parameter values and the initial conditions, yielding the same result each time, can be described as

   _____

4. For the purposes of this course, define "investigation." Where does the word "investigation" come from?

5. List at least five characteristics that could transform an "investigation" into a "***scientific investigation***"?

6. What are some of the uses of computation that we have used already – especially in labs – that facilitate a scientific investigation? Give examples for each from the 3 labs to date.

7. There are 5 apples on a table. You take away 3. How many apples do you have?

8. Consider a dataset from an experiment of a large number (N) of independent observations. In your own words, briefly describe what each of the following ***measures*** or ***predicts*** with respect to that dataset:

    a. Average

    b. Standard Deviation

    c. Standard Error

9. List as many reasons that you recall – explaining them briefly- that we have discussed in class why scientists would use a computer model in a scientific investigation.

10. (***non-graded***) The course has now completed its first month.

    a. What are some things –new to you– that you have learned so far?

    b. What are some things that you would like to learn before the course is over?