COSC150: Laboratory 1 (7 February 2023)

Collaboration and Introduction to Programming Concepts: Getting Started with Excel

I. Who are we: Collaboration using Google Sheets:

http://tinyurl.com/COSC150-Collaborations

II. Simple Programming Concepts

1. Variable names
2. Assignment
3. Random (pseudo-random) Number Generation
4. Iteration
5. Recursion
6. Controls
7. Conditions and Branching

One method of learning is to learn each skill, practice it, then apply it. Examples?
Use a "sandbox" approach, where you can learn specific skills without "fear" of harm.
Using Excel as a computational "sandbox". Developer mode.

III. Algebra, Arithmetic, Numerics (numerical computing)

1. What is "Exact", what is "approximate
2. Round-off vs. Truncation
3. What you learned in ARITHMETIC may not hold for NUMERICS

IV. Simple Pet Model

1. Variable names
2. Assignment
3. Control

V. Flipping a coin, Genetics

1. Variable Names
2. Conditions, Branching
3. You vs. Machine
4. Model Analogy

VI. Simple Time model Functions of time, counting

1. Variable names
2. Assignment
3. Iteration vs. Recursion
4. Conditions and Branching
5. Visualization

VII. Diffusion Model

1. Averaging Neighbors:
    a. Define absolutely correctly for one cell
    b. “Spread” the definition to all cells in one column
    c. “Spread” the column definition to many columns
2. Variable names, Assignment, Iteration, Control, Recursion, Conditions and Branching
3. Visualization