Introduction to Numerical Analysis: Week 2

- Theory Part
  - Difference Equations (Chapter 1.3 of *Kincaid-Cheney*)
  - Computer Arithmetic (Chapter 2.0–2.2 of *Kincaid-Cheney*)
- Programming Part
  - More on Loops and Conditions
  - Introducing the *NumPy* library
  - Writing Functions
- Exercises

1. Find the binary expressions for the decimal numbers 18 and 119.3.
2. For decimal numbers, you can multiply by the decimal number 100 by appending two zeros. Devise a similar rule for multiplying a binary number by 256.
3. Prove that the ratio of decimal numbers $\frac{4}{5}$ is not representable exactly on the MARC-32. What is the closest machine number? What is the relative roundoff error involved in storing this number on *Kincaid-Cheney*'s hypothetical machine MARC-32? (*Hint: See Ex. 1 in p. 46 there.*)
4. Problem 2.1.39 of *Kincaid-Cheney* (Here "evaluate" means to write the number as a decimal integer fraction.)
5. Problem 2.2.8 of *Kincaid-Cheney*