

Assignment #1

Due Thursday, 7 September at the start of class

Please read the preface and sections 1.1, 1.2, 1.3, 2.1, 2.2 of the textbook J. Epperson, *An Intro. to Numerical Methods and Analysis*, 2nd edition.

Section 1.1, pages 11–14:

- Exercise 2
- Exercise 7
- Exercise 11 parts (b) and (c) only
- Exercise 21
- Exercise 22

Section 1.2, pages 19–20:

- Exercise 3
- Exercise 6

Section 2.1, pages 46–47:

- Exercise 1 parts (a) and (b) only
- Exercise 4 test your code on (a),(b) only

P1. Calculate $(626)^{1/4}$ to within 10^{-5} of the exact value *without* any computing machinery except a pencil or pen. Prove that your answer has this accuracy. (Hint: You may, of course, use a computer to check your by-hand value.)

P2. (The following is entirely a programming exercise. It is practice in writing functions, using `if` statements for input-checking, and using `for` loops for computations.)

Write a MATLAB function with first line

```
function combin(n,k)
```

It will be a text file with name `combin.m`. The function computes the well-known number of combinations of, i.e. ways of choosing, k items from a set of n items:

$$\text{combin}(n, k) = \binom{n}{k}.$$

Your code must satisfy these specific requirements:

- It does not use the built-in `factorial()` function.
- It reports an error if the inputs n, k are invalid. (They should be nonnegative integers and etc.; please decide which inputs are acceptable. Consider using `error()`.)
- It has a reasonable “help file,” i.e. a leading contiguous block of comments which returns informative and useful results if the user types “`help combin`”.

Generate the first ten lines of Pascal’s triangle using your `combin(n, k)`.