Study guide for Chap 01

The exam problems will be closely related to your homework problems. Make sure you understand all the homework problems.

1. Prerequisite: Review basic programming skills including 'for loop', 'while loop', etc in your favorite programming language.

2. Section 1.2: Study the details about floating point binary expressions, such as how to turn a decimal 0.2 into a binary expression and vice versa.

3. Section 1.2: Review IEEE single (double) precision arithmetic such as, "Why does it take 32 (64) bits to store a single (double) precision floating point number?", "How is machine epsilon obtained?", etc.

4. Section 1.2: Study the derivation of the upper bound for relative error cause by chopping and rounding.

5. Section 1.2: Understand how floating errors are amplified through multiplication, division and addition of two numbers of the same sign.

6. Section 1.2: Understand the source of loss of significance caused by subtraction and how to avoid them. Study the examples in the textbook.

7. Section 1.3: Read the Illustration on page 32 and 33 and the example in your homework carefully. Understand the cause of instability for recurrence formula.

8. Section 1.3: Review the definition of 'rate, or order, of convergence $O(\beta_n)$' on p37. Note the difference with 'converge to p of order α' on page 78.

9. Section 1.3: Study how to obtain rate of convergence numerically by means of scaled plot and/or how to extract relevant constants from the data.