Overview of Week 4: Algorithms and Asymptotic Analysis

Read these sections from the textbook:

§1.1 – 1.2;
§2.2;
§3.1;
§10.1 – 10.2;
§12.1;
§22.1;
§A.1-A.2
§B.4 – B.5

Topics for week 4

1) Algorithms
2) Example 1: algorithm to count the number of positive values in an array of real numbers
3) Example 2: The Greatest Common Divisor (GCD) problem.
4) Fundamentals of Algorithmic Problem Solving
5) Important Problem Types
6) Fundamental Data Structures
7) Essential Mathematical Ideas
    A) Rounding – floor, ceiling, nearest
    B) Integer arithmetic - mod and div
    C) Powers/Exponents
    D) Logarithms base 2
    E) Summations
8) Asymptotic Analysis
    the basics of algorithm analysis
    three asymptotic classes – Big-Oh, Big-Omega, Big-Theta
9) Example 3: Sequential Search
10) Example 4: Maximum Element Problem
11) Example 5: Element Uniqueness Problem
12) Example 6: Binary Digit Counting Problem

Discussion board
Quiz
Worksheet
Python Coding Assignment