Chapter 1 Assignment

1.4: One characteristic of natural languages that prevents them from being used as programming languages is that they can be ambiguous. Due to this, it is hard for a computer to do what is told, if there can be multiple interpretations due to this ambiguity.

1.10: Three characteristics of an algorithm are definiteness, effective computability, and finiteness. Definiteness refers to how precise each step is stated. Effective computability refers to whether the step can be carried out by a computer or not. Lastly, finiteness is the procedure ending.

1.16: Some things specified by an ISA are the set of instructions a computer can carry out, the representations for the operands (data types), and the mechanisms the computer can use to figure out where the operands are located (addressing nodes). Others can include the number of unique locations that comprise the computer’s memory and how many 1’s and 0’s are contained in each location.

1.18: In a single microarchitecture, there is normally 1 ISA. For a single ISA, there can be infinite microarchitectures.

1.20: The levels of transformation being referred to as levels of abstraction is a reasonable characterization because each level can be further broken down. Problems can be broken into different aspects of the problem, algorithms be broken into steps, language into grammar, syntax, and format, and the concept can be applied to the other levels. Therefore, the levels of transformation can be reasonably referred as the levels of abstraction.