Assignment 3 – CS 507 - Theory of Programming Languages – Fall 2020

Due: Monday October 26, 2020 – (online on Google Class – 8 AM)

If any assignment is deemed to be copied from any other student or internet, you may be awarded an F grade in this course.

1. [10]
   Read about MAP and TABLE in SNOBOL programming language. Give an example of how they work with an example.

2. **[5 + 5]**
   a. In class, we discussed Conditional Assignment in SNOBOL and also talked about Immediate Assignment. Read more about Immediate assignment and explain the difference between conditional and immediate assignment.

   b. Assume the following statement. What will be the value of each variable after the statement is executed?
   BR = ((‘B’ | ‘R’) $ FIRST (‘E’ | ‘EA’) $ SECOND (‘D’ | ‘DS’) $ THIRD) . BRVAL

   BREAD BR

3. **[10]**
   Write a code in SNOBOL that prints multiplication table of value N till value X.
   For example: N*1, N*2, N*3, … N*X.

4. [10]
   Write the Fibonacci function in LISP:

   The Fibonacci function:
   $$fib(0) = 1$$
   $$fib(1) = 1$$
   $$fib(n) = fib(n-1)+fib(n-2), \text{ when } n>1$$

5. [10]
   Implement the towers of Hanoi problem in LISP. You have to print the disc label/number that is being moved from one peg to another. For example if there are 4 discs then assume that the biggest disc is labeled/named 4 and the smallest disc is labeled/numbered 1. So the output should look like:

   move disk 1 from peg A to peg B

6. [5 * 4]
List questions (implement in LISP):

   a. Find the maximum number in a list of numbers.
   b. Find the minimum number in a list of numbers.
   c. Write a predicate to reverse the items in a list
   d. Find the sum of squares of all items in the list