Assignment #1

Posted on Sep. 20 – due by Sep. 27, 2:00pm

Question 1: C++ Warm-Up

Write a C++ program that builds a binary search tree. Your program reads a list of words from stdin, for example:

nothing
is
more
exciting
than
wild
programming
in
c++

It then builds a binary search tree by simply adding the words in the order in which they appear in the input, without any balancing. For the example, it should be:

```
    nothing
     /    /
    is    than
   /   /    /
exciting more programming wild
   /     /    /
  c++   in   in
```
The program then writes the same list of words in the same order to stdout, but after each word it adds in parentheses a string indicating the left (L) and right (R) steps that you have to take from the root to arrive at the word’s node in the tree. It would look like this:

- nothing ()
- is (L)
- more (LR)
- exciting (LL)
- than (R)
- wild (RR)
- programming (RL)
- in (LLR)
- c++ (LLL)

Obviously, the first word in the list will always receive the empty string.

Your program has to use cin and cout, C++ style strings, build a tree structure using pointers, and free its memory before termination.

Do not use any libraries that we have not discussed in class, and write every line of code yourself. As with all assignments, you can discuss it with your fellow students but have to write answers and code by yourself; no teamwork allowed.

Place your code in your CS410 directory (a HW1 subdirectory would be a good idea). No memo is necessary if you comment your code and name variables well.

**Question 2:**

Critics of agile software development suggest that the process leads to systems that lack coherence in overall design. How do agile teams ensure that they avoid that outcome?

**Question 3:**

Which of the twelve principles in the agile manifesto do you think is the least compelling? Why?

**Question 4:**

In his blog post, Dan Milstein cites the research of Daniel Kahneman in support of his claim that software engineers are bad at making estimates. Under what conditions, however, does Kahneman’s research suggest that our ability to make estimates improves?