Tuesday 25 August 2020

CECS 342-01 Fall 2020

Assignment 1

Homework 1

1. Browse the Haskell website: https://www.haskell.org
2. Read (at least the first two chapters of) “Learn You a Haskell for Great Good!”: http://learnyouahaskell.com/chapters

Lab Assignment 1

1. Remember the sorting algorithms quick sort (Tony Hoare, 1959) and merge sort (John von Neumann, 1945).
2. Write each sorting algorithm in C and in Haskell by implementing the following functions:

```
void qsort2(int *a, int n);   // quick sort array a with n elements in place in C
void msort(int *a, int n);    // merge sort array a with n elements in place in C

qsort :: Ord a => [a] -> [a]  -- quick sort a list in Haskell
msort :: Ord a => [a] -> [a]  -- merge sort a list in Haskell
```

3. Write a brief comment for *every* line of your code explaining what it does.
4. In a separate text file write a few sentences explaining how and why the C and Haskell implementations of the same algorithms differ.
5. Write a simple main function (one in C and one in Haskell) to test your sort functions with the input sequence 4, 65, 2, -31, 0, 99, 2, 83, 782, 1 and print the result to the console.

Deliverable

1. You can work on this assignment in a group of up to 6 students.
2. At the due date you will take a brief quiz to test your understanding of the assignment.
3. During the lab session on the due date each group will do
    1. A brief demonstration of the running applications.
    2. A presentation explaining the source code.
    3. A brief discussion about the differences between C and Haskell.
4. *Due date:* **Tuesday 15 September 2020** at the beginning of lecture.