**CAIS 307 Homework Assignment 3**

Due date: Monday December 5th

**1 –** Write a Haskell program that prompts a user for an integer number and then displays all numbers below it that are either odd or a perfect square. A perfect square is an integer whose square root is another integer.

**2 –** Write a Haskell program that allows a user to enter as many numbers as they like (the user presses enter after each number) until they type the word “End”. Then the program will let the user know if the numbers where sorted (either in ascending or descending order) or not.

**Extra point for the final:**

Give the user the choice of sorting the numbers in either ascending or descending order and display the numbers again (one per line) but sorted as requested.

**3 –** Write a program that simulates a standard deck of cards. The program should give the following options to the user:

* **Reset the deck.**
* **Shuffle the deck.**
* **Deal a random card.**
* **Play guessing game**
* **Quit**

When the user chooses to deal a random card, the card is actually removed from the deck. If the user chooses to reset the deck then every dealt card is returned to the deck and then it is shuffled. The guessing game consists on the user entering the numeric value (1-13) and the suit of a card (clubs, spades, hearts or diamonds) and then the computer deals a random card and lets the user know if their guess was right or wrong.

Note: To achieve this you will need to generate random numbers, to do that you can use the function **randomRIO** which takes as input an ordered pair of integers **(a,b)** specifying a range. For example: **randomRIO (1,10)** will return a random integer between **1** and **10**. Be aware that this function returns an **IO (Int)** rather than an **Int**, so you cannot use it inside pure functions. Last but not least, this function is not in the default Haskell library Prelude, so you will have to import **System.Random** in your program to be able to use it.

**4 –** Write a simple Haskell text editor that allows a user to enter a set of text lines, the user will indicate they are done by typing the word “Stop” in one line. Then the program will give the user the following editing options:

**1) Replace first occurrence of word**

**2) Replace all occurrences of word**

**3) Delete first occurrence of word**

**4) Delete all occurrences of word**

**5) Capitalize first occurrence of word**

**6) Capitalize all occurrences of word**

**7) Quit**

If **option 1** is chosen the user will be asked to enter a word that exists in the paragraph and also a replacement word and then the first occurrence of the word will be replaced by the new word. If **option 2** is chosen, every single occurrence of the word will be replaced by the replacement word. If **option 3** is chosen the word chosen by the user will simply be deleted. With **option 4** every single occurrence of that word will be deleted. **Options 5 and 6** work similarly but instead change the word or words to all upper case characters. Every time the user performs an editing operation the program should display the new edited text including the changes.