COMP1007/A Haskell Class Test
9 am 10 December 2013

Name:

Student ID:

When defining functions pay attention to any instructions and always give the type of the function. You may not use library functions apart from the `fold` functions, `map` and `filter` unless instructed to do so.

1. How will GHCi evaluate `take 5 [1,5..]`?

2. Explain what is a *type variable* and how is it used.

3. Define the *variant* of a function.

4. Write your own version of the library function `zip`, that zips up two lists into a list of tuples, using list comprehension style.

5. Write your own version of the library function `filter`, that uses a predicate to select the list of items in a given list that satisfy the predicate, using recursive function style.

6. Write the library function `length`, that returns the length of a list, in two different styles and call them `length1` and `length2`.

7. Write two properties that can be used to test `length1` and `length2` using `QuickCheck`.

8. Write a function called `capitalised`, that takes a word and returns the word capitalised, using the library functions `toUpper` and `toLower`.

9. Write a function called `name` that reads in a word then displays it on the screen capitalised.

10. Write a function `ispd` that tests whether a list of floating point numbers is a probability distribution.

11. Use higher order functions to write a function called `avProb`, that returns the average probability value for a probability distribution if its input list is a probability distribution and otherwise returns an error message.