

MATHFUN

Discrete Mathematics and Functional Programming

`poolen.myweb.port.ac.uk/mathfun`

Worksheet 8: Input/Output

Introduction

This worksheet aims to introduce you to Haskell's input/output mechanism. Begin by downloading the `Week8.hs` file from the unit web-site which includes some definitions from the lecture - experiment with these definitions before moving onto the exercises.

Exercises

1. Write a greeting program that asks the user for his or her name, and then outputs a personalised greeting. (For example, on input "Sam", the program should display "Hello, Sam".)
2. Write an `addTwoNumbers` program that reads two integers, each on a separate line, and displays their sum.
3. Write a `copyFile` program that copies a text-file. The program should ask the user for the name of the file to copy and the name that the copy should be called.
4. Write a program that allows the user to build up a list of strings by entering them in one at a time, and displays the list after every step. The program should exit when the user enters an empty string. An example execution is as follows:

```
Enter a line: hello
List is now ["hello"]
Enter a line: world
List is now ["hello","world"]
Enter a line:
```

Hint: use two definitions - a recursive

```
buildList :: [String] -> IO ()
```

function that builds up a list step-by-step, and another function `listBuilder` of type `IO ()` that starts off the computation by calling `buildList` with a suitable initial parameter value.

5. Write a program that reads an integer `n` from the user, then reads `n` integers (on separate lines), and finally displays the sum of the `n` numbers read. (Again, use two functions.)
6. [harder] The `Week8.hs` file contains two pure functions for converting between Fahrenheit and Celsius temperatures. Using these functions, write a program that allows the user to enter any number of temperatures, and then displays the average of all the temperatures entered. After entering each value, the user should be prompted to enter either an "f" or a "c" to say whether the entered value was in Fahrenheit or Celsius. The user should type a special value (e.g. the empty string or "stop") to finish. The average temperature should be outputted in both Fahrenheit and Celsius.