

91.301, Organization of Programming Languages
Spring 2008, Prof. Yanco

Problem Set 9: Streams

Out: Thursday, 17 April 2008

Due: Tuesday, 29 April 2008

Reading: Section 3.5 of SICP.

Compatibility: For this problem set, you'll need to use the `stream.ss` file (available on the web site) with DrScheme to have the stream commands. Use the language "Textual (MzScheme, includes R5RS)."

Problem 1: Use `stream-map` (p. 320 of textbook) to define a procedure called `convert-temps` that takes a stream of temperatures in Fahrenheit and returns a stream of converted temperatures in Celsius. Recall that to convert Fahrenheit to Celsius, the equation is $C = 5/9 * (F-32)$.

Problem 2: Use `stream-filter` (p. 322 of textbook) to define the stream of all integers that are evenly divisible by 2, 3, or 5.

Problem 3: Complete the following alternative definition of the integers stream:

```
(define integers (cons-stream 1 (stream-map <??> integers)))
```

Problem 4: Exercise 3.51 on p. 325.

Problem 5: Exercise 3.52 on p. 325-326.

Problem 6: Exercise 3.53 on p. 330.

Problem 7: Exercise 3.54 on p. 331.

Problem 8: Exercise 3.57 on p. 332.