STREAMS

COMPUTER SCIENCE MENTORS 61A

April 11 to April 15, 2016

1 Streams

1. Whats the advantage of using a stream over a linked list?

2. Whats the maximum size of a stream?

3. Whats stored in first and rest? What are their types?

4. When is the next element actually calculated?

2 What Would Scheme Print?

5. For each of the following lines of code, write what scheme would output.

```
scm> (define x 1)


scm> (if 2 3 4)


scm> (delay (+ x 1))


scm> (define (foo x) (+ x 10))


scm> (define bar (cons-stream (foo 1) (cons-stream (foo 2)
   bar)))


scm> (car bar)


scm> (cdr bar)


scm> (define (foo x) (+ x 1))

scm> (cdr-stream bar)

scm> (define (foo x) (+ x 5))

scm> (car bar)

scm> (cdr-stream bar)
```

3 Code Writing for Streams

6. Write out `double_naturals`, which is a stream that evaluates to the sequence 1, 1, 2, 2, 3, 3, etc.

```
(define (double_naturals)
    (double_naturals_helper 1 0)
)

(define (double_naturals_helper first flag)









)
```

7. Write out `interleave`, which returns a stream that alternates between the values in stream1 and stream2. Assume that the streams are infinitely long.

```
(define (interleave stream1 stream2)









)
```