**Assignment 3**

This assignment is worth 4 marks. Each question is worth 1 mark. Deadline 25th April EOD.

**General guidelines**

You may assume that the input provided is a valid input. For example, if the procedure expects two positive integers as input, you can assume that the input is always given in the correct form.

These questions do not require more than 5-10 lines per question.

Please do not request additional time for submission as I will be ignoring such email requests.

1. Create a circular buffer of fixed size $n$. Operations are

   - the constructor (make-cb buff-name $n$) which makes a buffer with name (buff-name) of size $n$.
   - Write $x$ at end of buffer (write-cb buff-name x).
   - Read from beginning of buffer (read-cb buff-name).

   Simplifying assumption:- Buffer does not overflow.

   Use set to implement this operation, so that mutators of the buffer run in $O(1)$ time.

2. Implement an in-place insertion-sort using set!. The procedure name is isort and takes as input a list and returns the sorted output.

3. Create a stream named harmonic. The $i^{th}$ element of the stream should contain the sum of $i$ terms of the harmonic series.

4. Create a stream named prime-mod, The $i^{th}$ element of the stream should contain the sum of first $i$ prime numbers modulo 10007.