Assignment 2
This assignment is worth 4 marks. Each question is worth 1 mark. Deadline
2nd March EOD.

General guidelines

You are not expected to optimize these algorithms. 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. Given a single argument procedure proc, write a procedure

   (repeated proc n) which returns a procedure. This procedure is the nth
   repeated application of the procedure proc. For-example (repeated square
   3) returns a procedure that applies square procedure thrice.

   Therefore ((repeated square 3) 2) should return 256.

2. Show that we can represent pairs of nonnegative integers using only num-
   bers and arithmetic operations if we represent the pair a and b as the
   integer that is the product $2^{a+1}3^{b+a}$. Give the corresponding definitions
   of the procedures my-cons, my-car, and my-cdr. my-cons should return
   a procedure. One can extract the two arguments a and b of the pair by
   defining procedure my-car and my-cdr.

3. Define a procedure (list-reducer $\ell\ell$) where $\ell\ell$ is a list of lists. The procedure
   returns a single list containing all lists in $\ell\ell$ which happen to be a two
   element list. For example

   (list-reducer (list '(3 4) '(5 (6 7)) '(9 10 11))) would return

   ((3 4) (5 (6 7)))

4. Create a list procedure (anti-cdr lis) which takes a non-empty list lis and
   returns a list containing all the elements of lis except the last element.