CS5001 Assignment 4

Programming Language: BSL

Due Date Wednesday 2/7 at 10:00pm

Purpose To design functions for self-referential data.

For this assignment and all future assignments you must upload a .rkt file in the specified language to the Handin server (handins.ccs.neu.edu).

Write enough `check-expect`s for these exercises so that when you hit "run" no black text appears (you will likely need more though!). Make sure to follow the Design Recipe!

Exercise 1 Develop the function `check-pass-6-10?`, which consumes a list of passwords (represented as strings) and produces a `Boolean` indicating whether all are at least 6 characters but no more than 10 characters long.

Generalize the function to `check-pass?`, which consumes a list of passwords and a minimum and maximum length and produces a `Boolean` indicating whether all passwords are within the allowed length span.

Exercise 2 Develop the function `cesarify` which consumes a list of symbols and returns the same list but with every instance of `'pizza` doubled. For example,

```
(cesarify (cons 'wurst (cons 'huevos (cons 'pizza (cons 'pants empty)))))
```

would be expected to return:

```
(cons 'wurst (cons 'huevos (cons 'pizza (cons 'pizza (cons 'pants empty)))))
```

Exercise 3 Exercises 167, 168, and 169 from the textbook

Exercise 4 The goal of this problem is to develop a camera-roll program such as you may have on your smart phone. The camera-roll starts with the first photo and displays the next photo if the right arrow is pressed.

Here are the data definitions you should use:

```
;; LoImg (List-of-Image) is one of:
;; – empty
;; – (cons Image LoImg)

(define-struct cr (index images))
; A CR (Camera Roll) is a (make-cr NaturalNumber LoImg)
; intepretation:
;  The index represents the position of the current image.
;  The index must be between 0 and the number of images in LoImg.
```

Create a world program to display images from a `CR` and allow the user to scroll through the photos back and forth using the left and right arrow keys:

Design the function `display-photo`, which consumes a `CR` and returns the current image.

Design the function `change-photo`, which allows a user to change the current photo with the left and right arrow keys. If the current photo is the first photo, then pressing the left arrow should not change the photo. Likewise, if the current photo is the last photo, pressing the right arrow should have no effect.

Note: You will need to use several helper functions.