Lab 06: Lists

Create a separate file for each question. Keep them in your "Labs" folder, with the name `liiqj` for Lab ii, Question j.

Download the headers for each function from the file `labinterface06.rkt` linked off the "Labs" page on the course Web site.

After you have completed a question (except class exercises), including creating tests for it, you can obtain feedback by submitting it and requesting a public test. Follow the instructions given in the Style Guide.

Language level: Beginning Student.

1. *[Class exercise with lab instructor assistance]* Complete the function *make-canadian* from lecture.

2. Create a function *count-even-strings* that consumes a list of strings and produces the number of strings in the list that have even length.

3. Create a function *list-pos* that consumes a nonempty list and an item that is guaranteed to be in the list and returns the position of the first occurrence of the item in the list. The first item in the list is in position 0.

4. Create a function *switch-case* that consumes a string and produces a string in which each lower-case letter is converted to an upper-case letter, each upper-case letter is converted to a lower-case letter, and all other characters are preserved.

5. Create a function *differences* that consumes a nonempty list of numbers and produces a list of differences between adjacent pairs (or *empty* for a list of length 1). For example, for the list 25, 16, 9, 1, 4 the list of differences would be 9, 7, 8, -3.

6. Create a function *next-list* that consumes a list and an item, and produces either the item in the list that appears after the input item (the next item in the list right after the item that is consumed) or the symbol `'none` if the input item is either the last item in the list or not in the list.

7. *Optional open-ended questions* Create a function that consumes a list of Boolean values, representing the binary encoding of a number (*true* is 1 and *false* is 0), and produces the binary encoding of a number one greater. Consider functions that double a binary number or make a binary number one smaller.

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