Cogs 502 Fall 2018
Symbols and Programming Assignment 02 due Oct 16

Task 1

You need to learn to use a terminal (=command-line). You can launch a terminal by clicking the terminal icon – the thing that looks like a screen. Complete the tutorials One and Two here.

Task 2

Write down what the following expressions evaluate to; work them out before trying on the computer. Some expressions might cause an error; just mark them as an error, no need to specify the error itself.

(a) `(cons 2)`

(b) `(cons 2 NIL)`

(c) `(cons 3 '(2))`

(d) `(cons 3 (2))`

(e) `(cons NIL NIL)`

(f) `(cons (1 2) NIL)`

(g) `(cons '(1 2) NIL)`

(h) `(cons (A B) NIL)`

(i) `(cons ('A 'B) NIL)`

(j) `(cons '(A B) NIL)`

(k) `(cons '(A B) '(C D))`

(l) `(list 1 4)`

(m) `(list 1 '4)`

(n) `(list '1 4)`

(o) `(list 'A B)`

(p) `(list 'A 4)`

(q) `(list 'A 'B)`

(r) `('list 1 4)`

(s) `(+ 3 '4)`

(t) `('+ 1 4)`

(u) `(list 3 'times '(- 5 2) 'is 9)`

(v) `(list 3 'times (- 5 2) 'is '9)`

Task 3

Define a function that takes a list and an object, and returns a list where the object is added to the beginning of the list.

Task 4

Using `CAR` and `CDR`, define a function to return the fourth element of a list.[1]

Task 5

Define a function named `insert-2nd`, which takes a list and an object, and gives back a list where the element is inserted after the first element of the given list. Assume that the input list will have at least one element. Here is a sample interaction:

[1] Graham (1996), p. 29, ex. 3.

```
* (insert-2nd 'b '(a c))

(A B C)
* (insert-2nd '(b k) '(a c))

(A (B K) C)
*
```

Task 6

Define a function named `replace-2nd`, which is like `insert-2nd`, but *replaces* the element at the 2nd position. Assume that the input list will always have at least two elements.

Task 7

Define a function `swap`, that takes a two element list and switches the order of the elements.