## **CMPUT 325 LEC B1 - Winter 2021 - NON-PROCEDURAL PROG LANGUAGES**

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## **Example of Reduction**

Consider the program

```
(count (L) = (if (null L) 0 (+ 1 (count (rest L)))) )
)
```

The following sequence of reduction steps should give you a good idea how your interpreter should work.

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```
(count (1 2 3))
=> (if (null (1 2 3))
      0
       (+ 1 (count (rest (1 2 3)))))
=> (if nil
      0
       (+ 1 (count (rest (1 2 3)))))
=> (+ 1 (count (rest (1 2 3))))
=> (+ 1 (count (2 3)))
=> (+ 1 (if (null (2 3))
            (+ 1 (count (rest (2 3))))))
=> (+ 1 (if nil
           0
            (+ 1 (count (rest (2 3))))))
=> (+ 1 (+ 1 (count (rest (2 3)))))
=> (+ 1 (+ 1 (count (3))))
=> (+ 1 (+ 1 (if (null (3))
                0
                (+ 1 (count (rest (3))))))
=> (+ 1 (+ 1 (if nil
                 (+ 1 (count (rest (3))))))
=> (+ 1 (+ 1 (+ 1 (count (rest (3))))))
=> (+ 1 (+ 1 (+ 1 (count NIL))))
=> (+ 1 (+ 1 (+ 1 (if (null NIL)
                      (+ 1 (count (rest NIL))))))
=> (+ 1 (+ 1 (+ 1 (if T
                      (+ 1 (count (rest NIL))))))
=> (+ 1 (+ 1 (+ 1 0)))
=> (+ 1 (+ 1 1))
=> (+ 1 2)
=> 3
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  setq
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```

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