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

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.

```
   (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))
            0
            (+ 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
                 0
                 (+ 1 (count (rest (3)))))))

=> (+ 1 (+ 1 (+ 1 (count (rest (3))))))

=> (+ 1 (+ 1 (+ 1 (count NIL))))

=> (+ 1 (+ 1 (+ 1 (if (null NIL)
                       0
                       (+ 1 (count (rest NIL)))))))

=> (+ 1 (+ 1 (+ 1 (if T
                       0
                       (+ 1 (count (rest NIL)))))))

=> (+ 1 (+ 1 (+ 1 0)))

=> (+ 1 (+ 1 1))
=> (+ 1 2)
=> 3
```

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◄ setq

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