Tyler Hoagland

Midterm 2 S22

Base Cases:

- The first base case would be if you were here I never which is both the root and one electron

Case 1:

- If we make the root of the tree v an electron then it's children(v) are not electrons, thus we recurse on it's grandchildren(v).

let $v' =$ grandchildren(v)

$$1 + \sum L[v'], \text{ where } v' \in \text{grandchildren}(v)$$

Case 2:

- If the root of the tree is not an electron, then it's children(v) is an electron, such that the grandchildren(v) is not an electron, thus we would recurse on children(v).

let $v'' =$ children(v)

$$\sum L[v''], \text{ where } v'' \in \text{children}(v)$$

From this our recurrence relation will be:

$$L[v] = \begin{cases} 1 & : |\text{children}(v)| = 0 \\ \max\left(1 + \sum L[v'], \sum L[v'']\right) & : |\text{children}(v)| > 0 \end{cases}$$