

Wrapping up the previous 2 weeks

11-17-17

More Linked List

- Build a list with 5 Nodes manually
- Build a list with 5 Nodes using push (Stack implementation)
- Review steps for insert

Write a method `times()` that takes a reference to a `Node`, `head`, and an integer, `n` as parameters. The method does not return anything but instead multiplies the data field of each element in the list by `n`. E.g. If the list contained 3, 4, 5, then the call `times(head, 10)` would change the list to contain 30, 40, 50.

Matrix Addition

$$\mathbf{A} + \mathbf{B} = \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix} + \begin{bmatrix} b_{11} & b_{12} & \cdots & b_{1n} \\ b_{21} & b_{22} & \cdots & b_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ b_{m1} & b_{m2} & \cdots & b_{mn} \end{bmatrix}$$
$$= \begin{bmatrix} a_{11} + b_{11} & a_{12} + b_{12} & \cdots & a_{1n} + b_{1n} \\ a_{21} + b_{21} & a_{22} + b_{22} & \cdots & a_{2n} + b_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} + b_{m1} & a_{m2} + b_{m2} & \cdots & a_{mn} + b_{mn} \end{bmatrix}$$

Matrix Addition

$$\begin{bmatrix} 1 & 3 \\ 1 & 0 \\ 1 & 2 \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 7 & 5 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} 1+0 & 3+0 \\ 1+7 & 0+5 \\ 1+2 & 2+1 \end{bmatrix} = \begin{bmatrix} 1 & 3 \\ 8 & 5 \\ 3 & 3 \end{bmatrix}$$

Matrix Multiplication

$$\mathbf{AB} = \begin{pmatrix} a & b & c \\ p & q & r \\ u & v & w \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} ax + by + cz \\ px + qy + rz \\ ux + vy + wz \end{pmatrix}$$

Array List

- `add()`
 - `add(item)` – adds item to the end of a list
 - `add(n, item)` – adds item to nth position in list
- `get()`
 - `get(n)` – returns element at index n
- `set()`
 - `set(n, item)` – sets nth element to item
- `indexOf()`
 - `indexOf(item)` – returns index of first occurrence of item
- `remove()`
 - `remove(n)` – removes element at index n
 - `remove(item)` – removes element at first occurrence of item