

4.10

Doubly Linked Lists

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4.10 Double Linked Lists

- Each node has **TWO** link fields
- Could move in **TWO directions** to visit nodes

Node
Left link field ← a_0 → Right link field

Linear list
 $first \rightarrow 0 \rightarrow x_1 \leftrightarrow x_2 \leftrightarrow \dots \leftrightarrow x_n \rightarrow 0$

Circular list
 $first \rightarrow x_1 \leftrightarrow x_2 \leftrightarrow \dots \leftrightarrow x_n \rightarrow x_1$

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Double Linked Lists: Delete

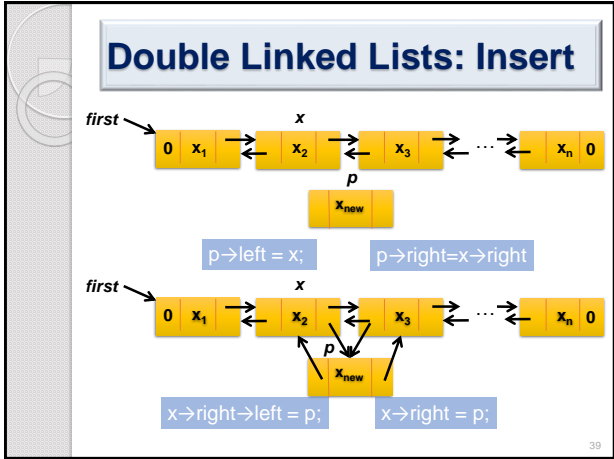
$first \rightarrow 0 \rightarrow x_1 \leftrightarrow x_2 \leftrightarrow x_3 \leftrightarrow \dots \leftrightarrow x_n \rightarrow 0$
 ~~x_2~~

$x \rightarrow left \rightarrow right = x \rightarrow right; \quad x \rightarrow right \rightarrow left = x \rightarrow left;$

$first \rightarrow 0 \rightarrow x_1 \leftrightarrow x_2 \leftrightarrow x_3 \leftrightarrow \dots \leftrightarrow x_n \rightarrow 0$
 delete x_2 ;

$first \rightarrow 0 \rightarrow x_1 \leftrightarrow x_3 \leftrightarrow \dots \leftrightarrow x_n \rightarrow 0$

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Self-Study Topics

- 4.5 Available Space Lists
- 4.6 Linked Stacks and Queues
- 4.7 Polynomial using linked lists
- 4.8 Equivalence Classes
- 4.11 Generalized Lists



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