CS 2050
Computer Science II

Lesson 04

Agenda

- Introduction to Lists:
  - Array Lists
  - Linked Lists

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Lists

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Lists

0   1   2   3   4   5   6   7

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Lists

Lists

0	1	2	3	4	5	6	7

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Lists

0   1   2   3   4   5   6

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Lists: Definition

$L = (a_0, a_1, a_2, \ldots, a_{n-1})$, where:

a_i, $0 \le i \le n-1$, are of the same data type

a_i, are called elements

n is the total number of elements in L

a_0 is the list's head

a_{n-1} is the list's tail

8

Lists: Representation

- Arrays

A	B	C	D	E

- Linked Lists

A → B → C → D → E → ...

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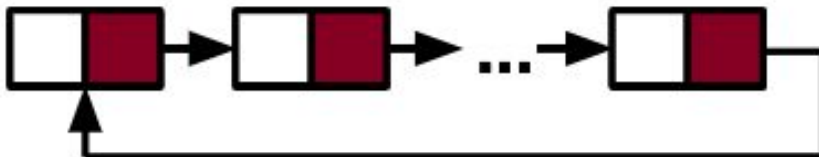# Linked Lists

- Singly

- Doubly

- Multiply

- Circular

Linked Lists: Operations

- Add new element in front
- Add new element at the end
- Print
- Obtain its length
- Verify whether it is empty
- Read value of position i
- Write new value at position i
- Insert new element at position i
- Remove element at position i

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Linked Lists: Operations

- ~~Add new element in front~~
- ~~Add new element at the end~~
- ~~Print~~
- ~~Obtain its length~~
- ~~Verify whether it is empty~~
- ~~Read value of position i~~
- ~~Write new value at position i~~
- ~~Insert new element at position i~~
- Remove element at position i

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Linked Lists

- Node:

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. Linked List:

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