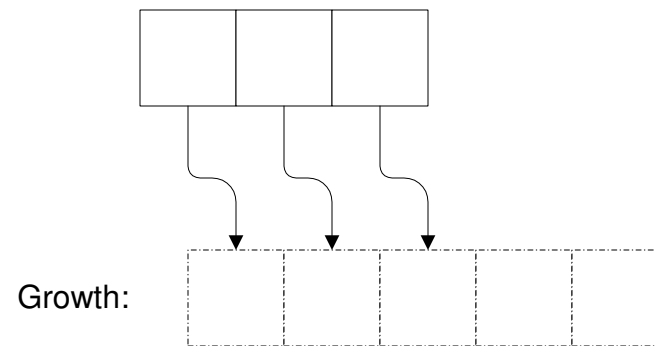# Data Structures - Array
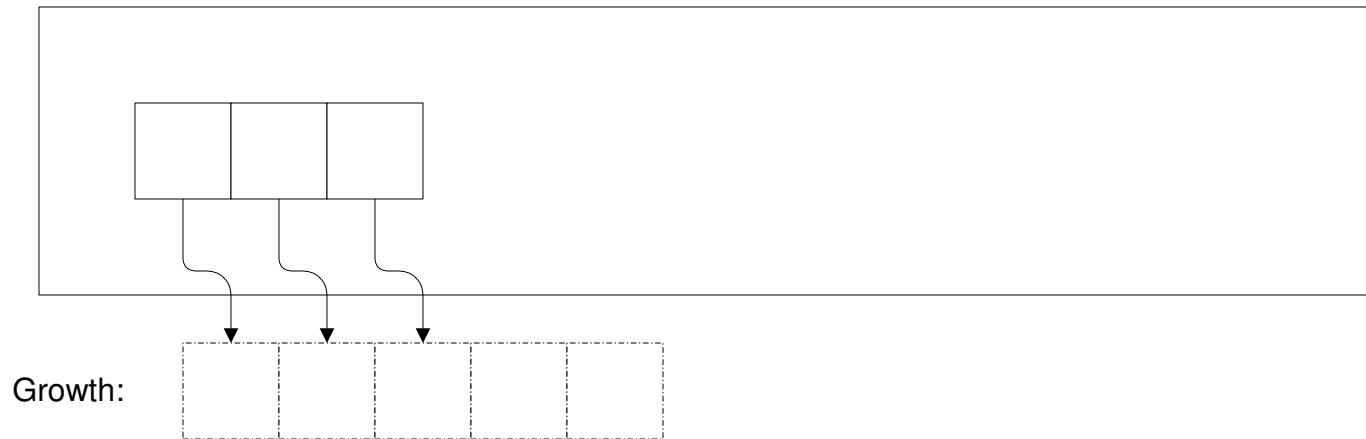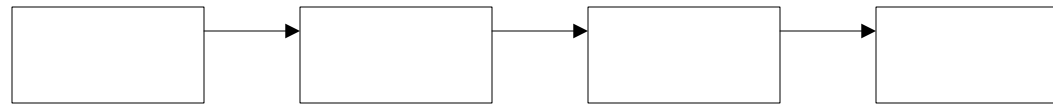
Growth:

Traversal   O(1)

Growth   O(N)

Insertion   O(N)

Random access   O(1)

Managed?   No
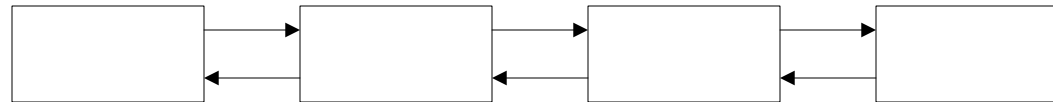
Data Structures - Array list (Vector)

Growth:

Traversal	O(1)
Growth	O(N)
Insertion	O(N)
Random access	O(1)
Managed?	Yes

Data Structures - Linked List

Traversal

Traversal

Traversal	O(1)
Growth	O(1)
Insertion	O(1)
Random access	O(N)
Managed?	Yes

7	Lee

5	Bob

3	Susan

10	Steve

2	Ed

7	Lee

12	Eric

Traversal	O(1)
Growth	O(log(N)) to O(N)
Insertion	O(log(N)) to O(N)
Search	O(log(N)) to O(N)
Managed?	Yes

7	Lee

hash key

bucket 1			bucket 2			bucket 3		
2	Ed	3	Susan	5	Bob	11	Tom	
						10	Steve	12	Eric