Vectors

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Vectors / Arraylists / Dynamic Arrays

- A Vector, also called an Arraylist or a Dynamic Array, can be seen as a resizable array.
- Vectors combine the benefits of arrays and lists:
  - Elements are placed in sequence which enables quick random access.
  - Resizable.
- Typically they are implemented by using a normal array that is reallocated whenever the Vector needs to increase its capacity.
  - Resizing the Vector, that is deallocating and reallocating the underlying array, is an expensive operation and the main disadvantage of using a Vector.

Vectors: Resize

- Vectors are characterized by two values:
  - Capacity: the maximum number of elements that can fit in the Vector before resizing.
  - Size: the number of elements that are held in the Vector.
- When a new insertion is attempted, the Vector checks if it has sufficient capacity to contain it. If it doesn't, a *resize* operation takes place and the element is inserted afterwards.
- Resizing usually doubles the capacity of the Vector. Resizing does not change the the positions of existing elements.

0	a
1	b
2	c
3	
4	
5	

size: 3

capacity: 6