

EECS 204002
 Data Structures 資料結構
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**CH. 2
 ARRAYS**

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2.2

**Array Abstract
 Data Type**

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2.2 **Definition of Array**

- A data structure that represents an **ordered** or **linear list**.
- Elements in an array could be the same or different data types.
 - Days of the week:
 - {Sunday, Monday, ..., Saturday}
 - Deck of cards:
 - {Ace, 2, 3, ..., King}
 - Phone Book:
 - {(James, #1), (Claire, #2), ..., (Tony, #n)}

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Common Array Operations

- ADT array[n]={a₀, a₁, ..., a_{n-1}}
- 1. Find the length, n, of the array.
- 2. Read the array from left to right (or reverse).
- 3. Retrieve the ith element, 0 ≤ i < n.
- 4. Store a new element into ith position, 0 ≤ i < n.
- 5. Insert/delete the element at position i, 0 ≤ i < n.
- It is not necessary to include all operations
- Different representations carry out different subset of operations efficiently.

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Array Representations

- **Sequential mapping**
 - Element a_i is stored in the location i of the array
 - The most commonly used
 - Efficient random access (operation 1,2,3)
- **Non-sequential mapping**
 - Perform insertion and deletion efficiently
 - E.g. Linked Lists in chapter 4

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