➔ Arrays

- Pretty similar to this box of Macarons!
- The box(~array) has fixed size n cannot be changed!
- Each macaron is accessible due to its unique location(~green—>4th one)
- Box is produced only for storing macarons! (cannot include Puffine)
- Macarons are next to each other without any gap!

29	17	42	13	56

➔Array

- Array can store of specified type!(~if ya create an array of integers, ya cannot insert a string!)
- Elements of the array are next to each other in the memory(no gap!)
- Each element of array has unique index!(~access element 42, arr[2])
- Size of array is predefined n cannot be changed! When we define its capacity!

➔What is array in CS?

- Collection of elements, each identified by at least one index or key! The position of each element can be find by its index!

➔Arrays in Memory?

- Compiler decides to allocate cells in memory to it!
- 2D similar to 1D

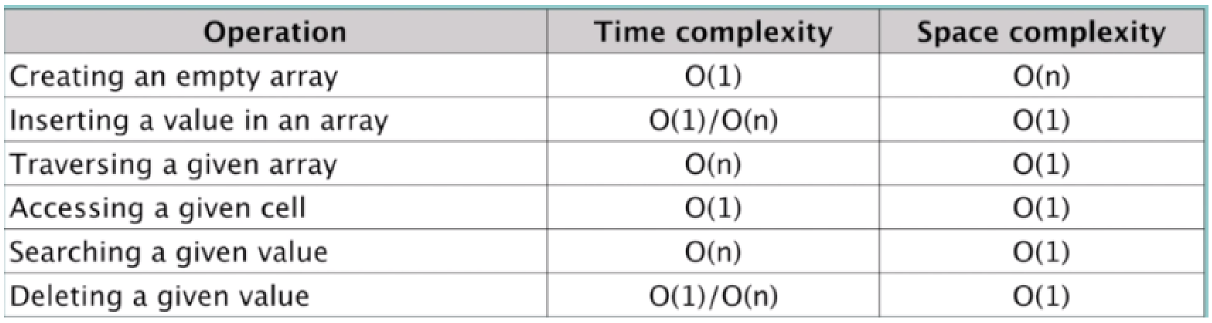
➔How to create an Array?

- Pretty efficient in accessing the elements BC they all are stored in a contiguous way(nxt to each other!)
- All the cells will be reserved in memory once ya define the size!
- Recommended when ya know the number of elements ya wanna use! Since the cells will be reserved!

➔traverse in Array

- ~ visiting ALL cells of the array till the end!
- How? Simply create a loop n start looking at each cell!

➔Accessing element in Array



Operation	Time complexity	Space complexity
Creating an empty array	O(1)	O(n)
Inserting a value in an array	O(1)/O(n)	O(1)
Traversing a given array	O(n)	O(1)
Accessing a given cell	O(1)	O(1)
Searching a given value	O(n)	O(1)
Deleting a given value	O(1)/O(n)	O(1)

- ➔ **2D Array**
  - ◆ **When to use? When ya need a Matrix! (exp. Day, get temperature 4 times a day!)**
- ➔ **When to use/avoid Array?**

  Use:

  1. **To store multiple variable of "same" data type**
  2. **Random access(cuz we have the index)**

  Avoid:

  1. **Same data type elements**
  2. **Reserve cell in memory!**