

Data Structure & Algorithm

Data Structure

Array

1. Định nghĩa

- Mảng là một tập hợp các phần tử có cùng một kiểu:

1	5	8	2	9
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'B'	'R'	'O'	'W'	'N'
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2. Phân loại

- Mảng 1 chiều:

0	1	2	3	4
1	5	8	2	9



`array[1] = 5`

- Mảng nhiều chiều:

	0	1	2	3	4
0	1	5	8	2	9
1	0	3	8	0	8
2	5	8	4	9	7



`array[2][4] = 7`

2. Phân loại

- Mảng tĩnh:

- Cần phải chỉ định số lượng phần tử khi khai báo.
- Được tạo trong vùng nhớ Stack.

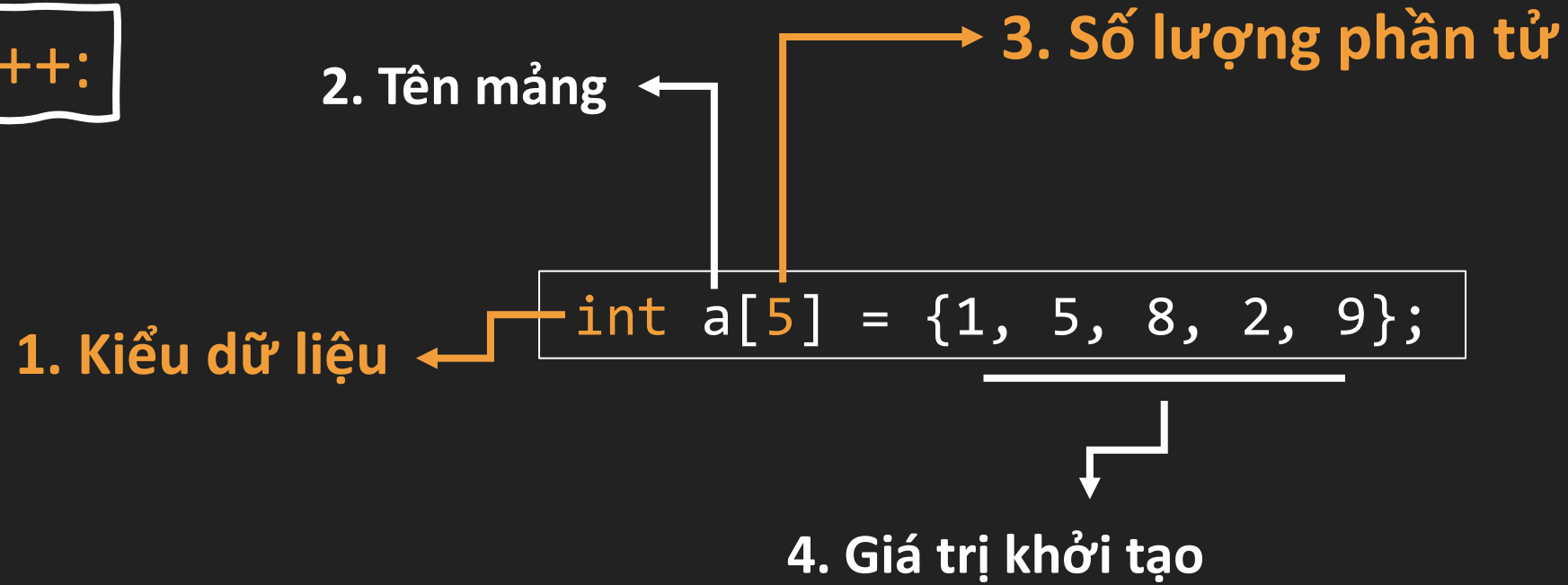
- Mảng động:

- Không cần chỉ định số lượng phần tử khi khai báo.
- Được tạo trong vùng nhớ Heap.

3. Khai báo

A- Mảng tĩnh

C/C++:



0	1	2	3	4
1	5	8	2	9

3. Khai báo

A- Mảng tĩnh

C/C++ : Các cách khai báo khác.

➤ `int a[5];`

➤ `int a[5] = {0};`

➤ `int a[] = {1, 5, 8, 2, 9};`



0	1	2	3	4
0	0	0	0	0



0	1	2	3	4
1	5	8	2	9

Java

➤ `int[] c = {1, 2, 3, 4, 5};`

3. Khai báo

B- Mảng động

C:

```
int* a = malloc(sizeof(int)*5);
```

<stdlib.h>

```
free(a);
```

C++:

```
int* a = new int[5];
```

```
delete[] a;
```

Java:

```
int[] a = new int[5];
```

4. Luyện tập

No.	ID	Name	Level	URL	Guide
1	485	Max Consecutive Ones	E	https://leetcode.com/problems/max-consecutive-ones/	https://www.youtube.com/watch?v=MxAybn96rIQ
2	1295	Find Numbers with Even Number of Digits	E	https://leetcode.com/problems/find-numbers-with-even-number-of-digits	https://www.youtube.com/watch?v=Lh1cpUO0ywc

5. Bài tập về nhà

No.	ID	Name	Level	URL	Guide
3	977	Squares of a Sorted Array	E	https://leetcode.com/problems/squares-of-a-sorted-array	https://www.youtube.com/watch?v=BJNvpYLw4Rg
4	1089	Duplicate Zeros	E	https://leetcode.com/problems/duplicate-zeros	https://www.youtube.com/watch?v=RzKE5Zlg1gc
5	88	Merge Sorted Array	E	https://leetcode.com/problems/merge-sorted-array	https://www.youtube.com/watch?v=-x9T4LBrTmA
6	27	Remove Element	E	https://leetcode.com/problems/remove-element	https://www.youtube.com/watch?v=AOP4FhSnkHE
7	26	Remove Duplicates from Sorted Array	E	https://leetcode.com/problems/remove-duplicates-from-sorted-array	https://www.youtube.com/watch?v=pMK8R3M_Lwk
8	1346	Check If N and Its Double Exist	E	https://leetcode.com/problems/check-if-n-and-its-double-exist	https://www.youtube.com/watch?v=OSgK6a_y-SI
9	941	Valid Mountain Array	E	https://leetcode.com/problems/valid-mountain-array	https://www.youtube.com/watch?v=5tZarJ6LiZc
10	1299	Replace Elements with Greatest Element on Right Side	E	https://leetcode.com/problems/replace-elements-with-greatest-element-on-right-side	https://www.youtube.com/watch?v=FAQtUPvtwEc
11	283	Move Zeroes	E	https://leetcode.com/problems/move-zeroes	https://www.youtube.com/watch?v=UsUTHGbpvzY
12	905	Sort Array By Parity	E	https://leetcode.com/problems/sort-array-by-parity	https://www.youtube.com/watch?v=9IjY90pkWj0
16	448	Find All Numbers Disappeared in an Array	E	https://leetcode.com/problems/find-all-numbers-disappeared-in-an-array	https://www.youtube.com/watch?v=1j-fMOGdE-Q

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