



ARRAYS AND STRINGS

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Array

- An array is a series of identical type of data stored together

- Declare an array:

- `type array_name[size];`

e.g.

```
int a[5];  
double b[10];  
className c[12]
```

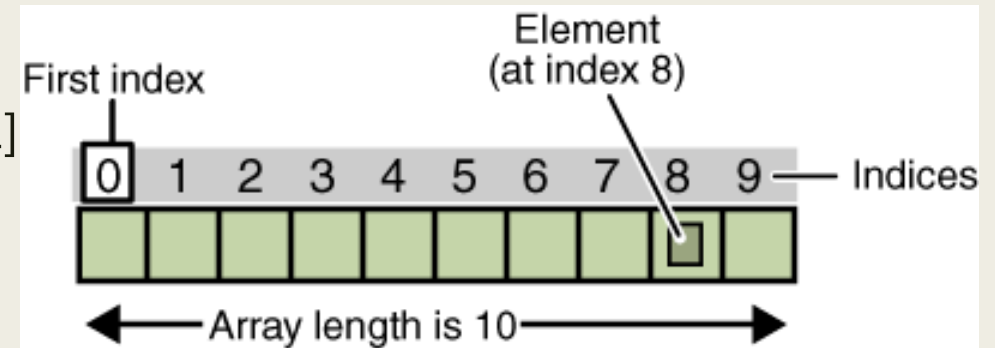
How it looks like in memory

array a

1	a[0]
2	a[1]
4	a[2]
8	a[3]
16	a[4]

- How to access each element: `array[xth - 1]`

- Second element in array **a**: `a[1]`
 - Ninth element in array **b**: `b[8]`



Easy to think this way
Array b

Array

- data type
- structure
- class

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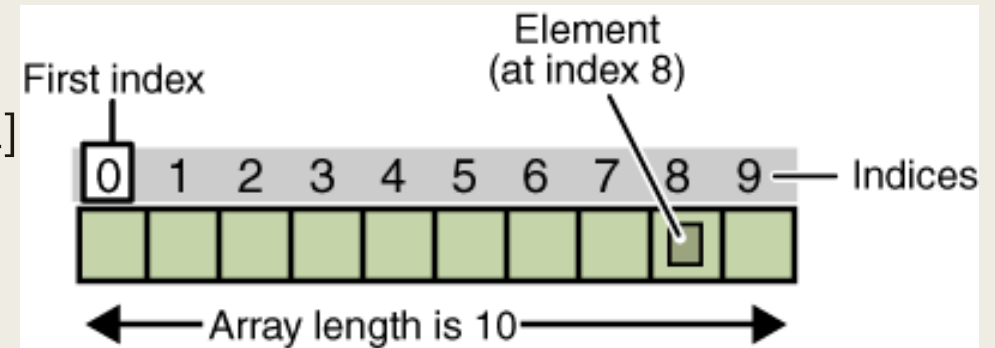
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- In declaration, it must be integer

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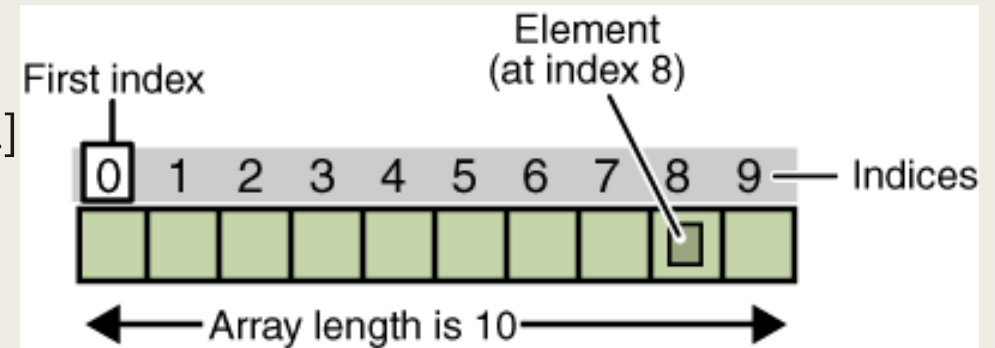
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- Declare an array:

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e.g. Initialization:

```
int a[5] = {1, 2, 3, 4, 5};
```

```
int d[] = {1,2,3,4,5};
```

- System will do it for you.
- Do not have to initialize
- Uninitialized

- Good idea to set to zero

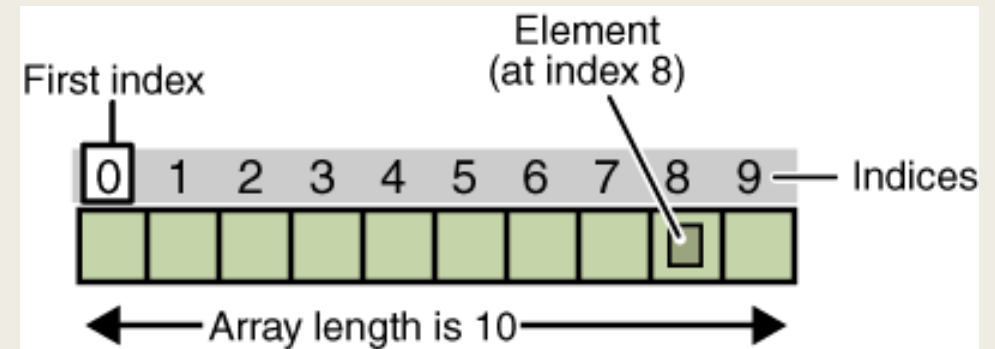
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Example

- See `class2_ex1.cpp`

Practice

- 1. Get 10 integers from user input and store them in an array
 - *Print the even ones*
- 2. Get two arrays of 10 integers each from user
 - *Print the sum of each index*

Practice

- Read 10 integers from user input
- Store it in an array
- Print the:
 - *Largest*
 - *Smallest*
 - *Average*

Rabbit Reproduction

- You start with one male and one female rabbit who have just been born
- A rabbit reaches maturity after one month
- The gestation period of a rabbit is one month
- Once it has reached maturity, a female rabbit will give birth every month
- A female rabbit always gives birth to one male rabbit and one female rabbit
- Rabbits never die
- Print the number of male and female rabbits in each month for a year
- See `class2_ex3.cpp`

Strings

- An array of characters
- With useful functions

K	a	r	e	n						
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String Functions

`getline(cin, str);` ← Gets a whole line from user input

`if(str1 == str2)` ← String comparison (`.equals()` in java)

`str1.length()` ← Returns length of string

`str1[0]` ← Accesses the first element of the string

`string str(10, 'x');` ← Initialize new string of length 10 filled with x

`str.find(str, pos)` ← return the position of the first character of that string

`str.find_last_of(str, pos)` ← Searches the string for the last character that matches **any** of the characters specified in its arguments.

`str.clear();` ← clear the string

Rest can be found at <http://www.cplusplus.com/reference/string/string/>

Example

See `class2_ex4.cpp`

Practice

- <http://dmoj.com/problem/ccc07j2>
- <http://dmoj.com/problem/ccc05j3>
- <http://dmoj.com/problem/ccc04j3>
- <http://dmoj.com/problem/ccc02j2>

Homework

- Solve these questions
 - <https://dmoj.ca/problem/ccc07j2>
 - <https://dmoj.ca/problem/ccc15j3>
 - <https://dmoj.ca/problem/ccc16j2>
- Submit solutions to @homeworkbot on Slack
 - *A single zipped file please*