

# CSE 121 – Lesson 12

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Summer 2023



Music:  [k-pop girlies playlist](#) 

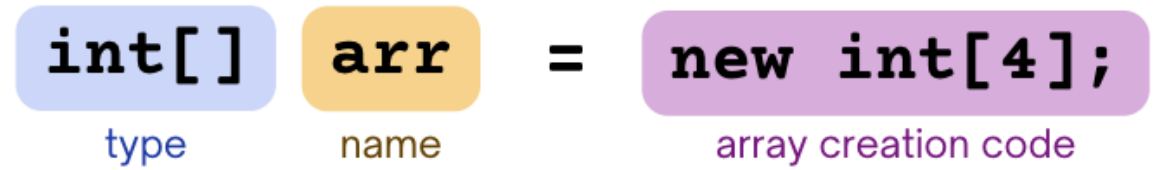
[sli.do #cse121](https://sli.do/#cse121)

# Announcements, Reminders

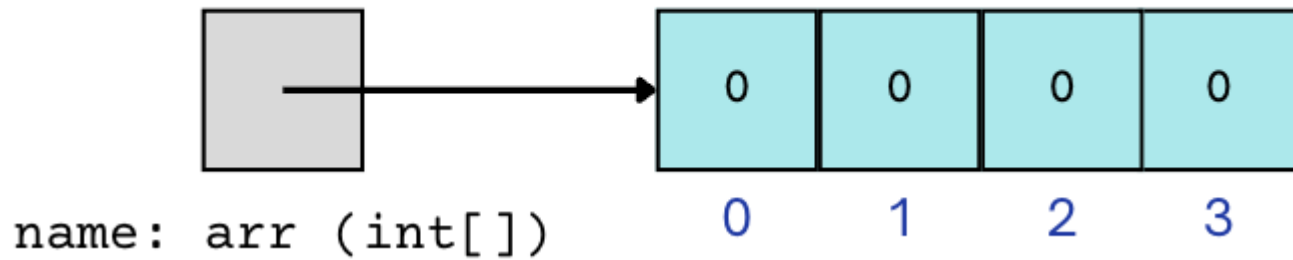
- Programming Assignment 2 due yesterday, Programming Assignment 3 Its Data Time out later today due next Tuesday
- C3 will be a take home final
- Resub 4 due tomorrow
- Quiz 2 (Take-home): Monday Aug 7<sup>th</sup> (8/7)
  - Topics: File I/O (Scanner, PrintStream), Arrays, Reference Semantics
- **Reminder:** Final exam Wednesday Aug 16 4:30 – 6:30 PM in PAA A102
- Left-Handed Seating Request form posted on Ed due Aug 7th EOD

# (PCM) Arrays

- Elements (must all be the same type)
- Indices (starting at 0)
- Must decide size when created
- `arr.length` to get arr's length
- `Arrays.toString(arr)` to get a nice String version



```
int[] arr = new int[4];
```



# (PCM) Array Traversal Pattern

```
for (int i = 0; i < arr.length; i++) {  
    // do something with arr[i]  
}
```

# Poll in with your answer!



How can we get the last element of an array `arr`?

- A. `arr[arr.length()]`
- B. `arr[length()]`
- C. `arr[arr.length]`
- D. `arr[arr.length() - 1]`
- E. `arr[arr.length - 1]`

# Poll in with your answer!



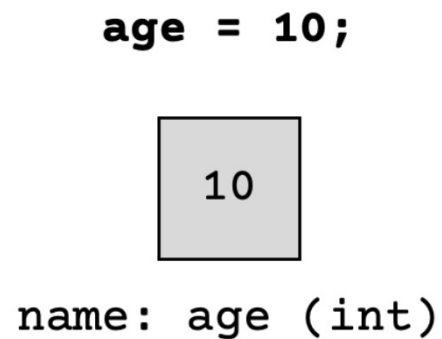
What would the array a store at the end of this arrayMystery method if  $\{-20, 20, 26, 32, 50, 3\}$  was passed in?

```
public static void arrayMystery(int[] a) {  
    for (int i = a.length - 1; i >= 1; i--) {  
        if (a[i] > a[i - 1] + 10) {  
            a[i - 1] = a[i - 1] + 5;  
        }  
    }  
}
```

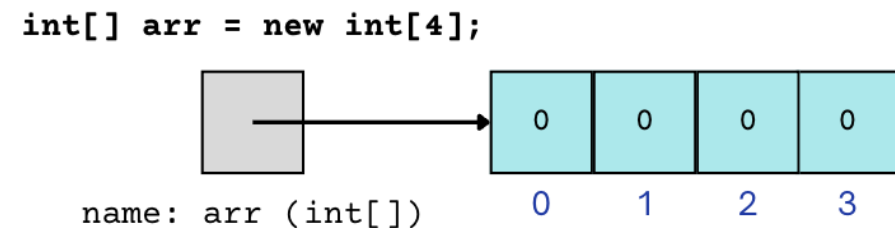
- A.  $\{-20, 20, 26, 32, 50, 3\}$
- B.  $\{-15, 25, 31, 37, 55, 8\}$
- C.  $\{-15, 25, 31, 37, 50, 3\}$
- D.  $\{-15, 20, 26, 37, 50, 3\}$

# (PCM) Value Semantics vs. Reference Semantics

- Applies when working with primitive types
- Variables/parameters hold a *copy* of the actual value



- Applies when working with objects
- Variables/parameters hold a *reference* to the object

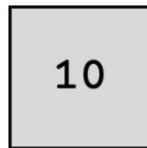


# (PCM) Value Semantics vs. Reference Semantics

```
int a = 3;  
int b = a;  
a = 99;
```

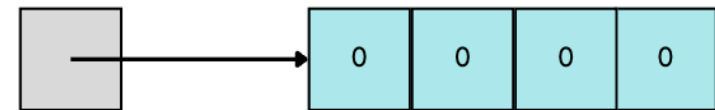
```
int[] list1 = {4, 8, 15, 16, 23};  
int[] list2 = list1;  
list1[1] = 99;
```

**age = 10;**



name: age (int)

`int[] arr = new int[4];`



name: arr (int[])

0 1 2 3



# (PCM) Value Semantics vs. Reference Semantics

```
boolean test = true;
flipValue(test);

public static void flipValue(boolean b) {
    b = !b;
}
```

```
boolean[] tests =
    {true, true, false, true, false, false};
flipValues(tests);

public static void flipValues(boolean[] b) {
    for (int i = 0; i < b.length; i++) {
        b[i] = !b[i];
    }
}
```

# Poll in with your answer!



```
public static void main(String[] args) {  
    int x = 0;  
    int[] a = new int[4];  
    x++;  
  
    mystery(x, a);  
    System.out.println(x + " " + Arrays.toString(a));  
  
    x++;  
    mystery(x, a);  
    System.out.println(x + " " + Arrays.toString(a));  
}
```

```
public static void mystery(int x, int[] a) {  
    x++;  
    a[x]++;  
    System.out.println(x + " " + Arrays.toString(a));  
}
```

Four lines of output would be produced by this code. What would those four lines be?

# Poll in with your answer!



```
public static void main(String[] args) {
    int x = 0;
    int[] a = new int[4];
    x++;

    mystery(x, a);
    System.out.println(x + " " + Arrays.toString(a));

    x++;
    mystery(x, a);
    System.out.println(x + " " + Arrays.toString(a));
}

public static void mystery(int x, int[] a) {
    x++;
    a[x]++;
    System.out.println(x + " " + Arrays.toString(a));
}
```