



Lecture 2: Reference Types

CS 2110

January 22, 2026

Today's Learning Outcomes

4. Explain how Java stores and references objects in memory.
5. Use the Java documentation to locate a method for a desired behavior and successfully incorporate that method into a program.
6. Draw object diagrams to visualize reference types.
7. Write Java programs involving arrays that utilize syntax for indexing and array literals.
8. Write and execute code in Java that uses program arguments.

Beyond Primitive Types

Recall: A type models a set of states and behaviors

Java's 8 primitive types only store simple data
(numbers, characters, true, false)

References and the Memory Heap

Construction

Instance Methods

See: <http://docs.oracle.com/en/java/javase/21/docs/api/java.base/java/lang/String.html>

Reference Semantics

```
String s1 = "hello";  
String s2 = s1;  
  
s1 = "goodbye";  
System.out.print(s2);
```

Reference Type Parameters

```
static void printLength(String s) {  
    System.out.print(s.length());  
}  
  
public static void main(String[] args) {  
    String message = "greetings";  
    printLength(message);  
}
```

null

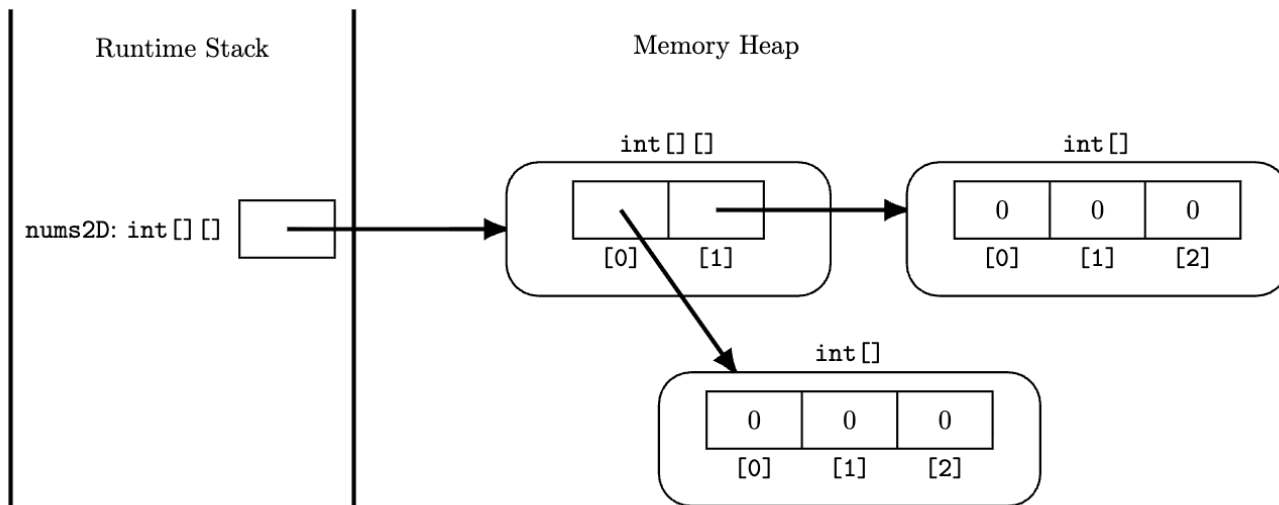
Arrays

Array Initialization and Array Literals

Array Indexing

Multi-Dimensional Arrays

```
int[][] nums2D = new int[2][3];
```



Program Arguments



Coding Demo: Echo Program

