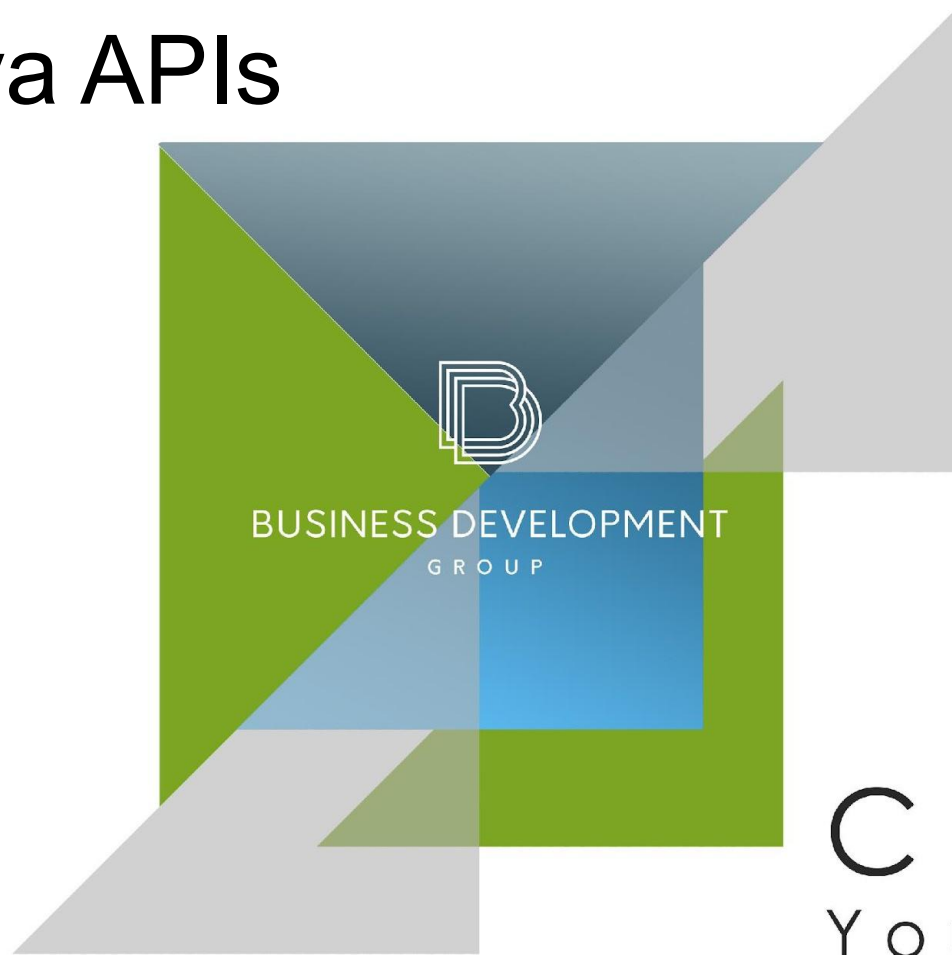


# Core Java APIs



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# Consider the following points

- Java Arrays
- Storage of arrays
- Methods of Arrays
- Multidimensional arrays
- ArrayList
- Methods of ArrayList



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# Java Arrays

An **array** is an ordered list with fixed size and allows multiple dimensions.

Type of array  
↓  
int[] numbers = new int[3];  
↓  
Array symbol (required)  
Size of array

```
9 int[] numbers = new int[] {42, 55, 99};
```

```
11 int[] numAnimals;  
12 int [] numAnimals2;  
13 int numAnimals3[];  
14 int numAnimals4 [];
```

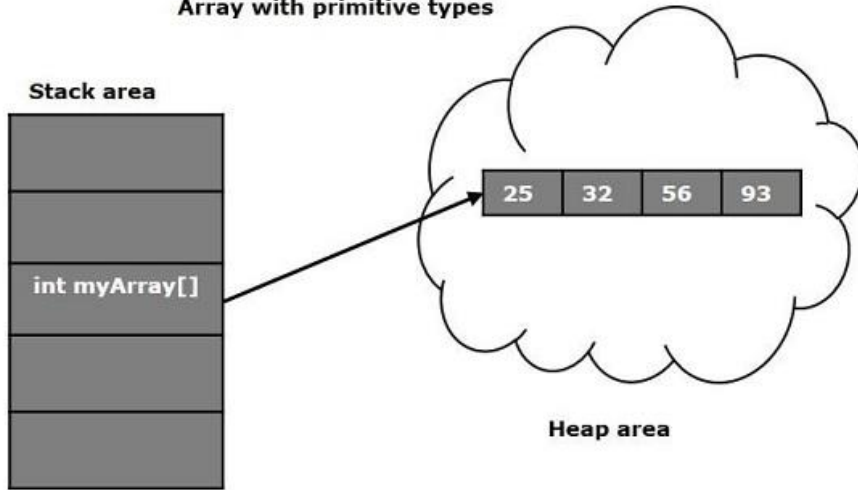
```
9  
10  
11  
12  
13  
14
```

```
String [] bugs = { "cricket", "beetle", "ladybug" };  
String [] alias = bugs;  
System.out.println(bugs.equals(alias)); // true  
System.out.println(bugs.toString()); // [Ljava.lang.String;@160bc7c0
```

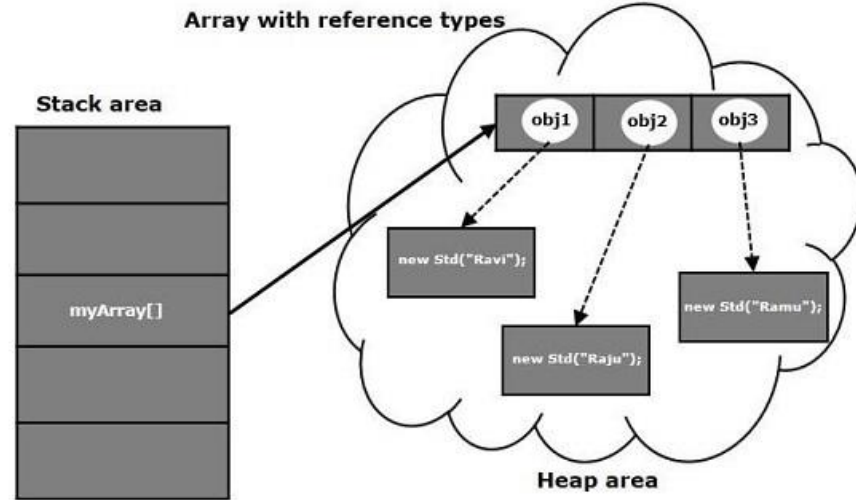


# Storage of Arrays

Array with primitive types



Array with reference types





# Methods of Arrays

- Sorting
- Searching

## Binary search rules

Scenario	Result
Target element found in sorted array	Index of match
Target element not found in sorted array	Negative value showing one smaller than the negative of index, where a match needs to be inserted to preserve sorted order
Unsorted array	Isn't predictable

```
int[] numbers = {6, 9, 1};  
Arrays.sort(numbers);
```

```
int[] sortedNumbers = {2, 4, 6, 8};  
System.out.println(Arrays.binarySearch(numbers, key: 2));  
System.out.println(Arrays.binarySearch(numbers, key: 4));  
System.out.println(Arrays.binarySearch(numbers, key: 1));  
System.out.println(Arrays.binarySearch(numbers, key: 3));  
System.out.println(Arrays.binarySearch(numbers, key: 9));
```



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# Multidimensional Arrays

```
int[][] vars1;  
int vars2 [][];  
int[] vars3[];  
int[] vars4 [], space [][];
```

```
int[][] differentSize = {{1, 4}, {3}, {9,8,7}};
```

```
int [][] vars = new int[4][];  
vars[0] = new int[5];  
vars[1] = new int[3];
```

Varargs

```
public static void main(String[] args) ~~~  
public static void main(String args[]) ~~~  
public static void main(String ... args)
```



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# ArrayList

```
ArrayList list1 = new ArrayList();  
ArrayList list2 = new ArrayList( initialCapacity: 10 );  
ArrayList list3 = new ArrayList(list1);  
  
ArrayList<String> list = new ArrayList<>();
```



# Methods of ArrayList

```
ArrayList cars = new ArrayList<>();  
cars.add("Mazda");  
cars.add(index: 1, element: true);  
cars.add(index: 4, element: "Opel");  
cars.remove(o: "Opel");  
cars.remove(index: 0);  
cars.remove(index: 10);  
cars.isEmpty();  
cars.size();  
cars.clear();
```

```
List<String> birds = new ArrayList<>();  
birds.add("hawk");  
birds.contains("hawk");
```

```
List<String> birds2 = new ArrayList<>();  
birds2.add("hawk");  
birds.equals(birds2);
```

## Converting between array and list

```
List<String> birds = new ArrayList<>();  
birds.add("hawk");  
birds.contains("hawk");
```

```
Object[] objects = birds.toArray();  
String[] strings = birds.toArray(new String[0]);
```

```
List<String> list = Arrays.asList(strings);
```





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