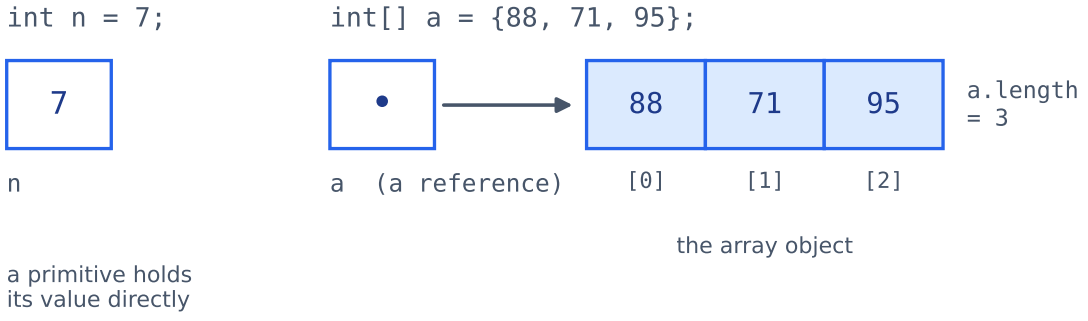
Arrays

Java Reference

1-D arrays

An array 数组 holds a fixed number of values of one type. Index from `0`, and get the size with `.length`.

```
public class Main {
    public static void main(String[] args) {
        int[] scores = {88, 71, 95};
        System.out.println(scores[0]);       // 88
        System.out.println(scores.length);   // 3
        scores[1] = 100;
        System.out.println(scores[1]);       // 100
    }
}
```



06-array-memory

A primitive holds its value; an array variable holds a reference to the array object

Array algorithms

Walk the array with a loop to find a max, a total, a count, or to search 查找. A for-each loop (`for (int x : a)`) reads each value in turn.

```
public class Main {
    public static void main(String[] args) {
        int[] a = {3, 9, 2, 7};
```

```
        int max = a[0], total = 0;
        for (int x : a) {
            if (x > max) max = x;
            total += x;
        }
        System.out.println(max + " " + total);   // 9 21
    }
}
```

2-D arrays

A 2-D array 二维数组 is a grid 网格 of rows and columns: `grid[row][col]`.

```
public class Main {
    public static void main(String[] args) {
        int[][] grid = {{1, 2, 3}, {4, 5, 6}};
        System.out.println(grid[1][2]);   // 6
        for (int[] row : grid) {
            for (int v : row) System.out.print(v + " ");
        }
        System.out.println();             // 1 2 3 4 5 6
    }
}
```

Common mistakes

- An array's size is `a.length` (no brackets, no `()`), and it is fixed when created.
- Valid indexes are `0` to `a.length - 1`; `a[a.length]` throws ArrayIndexOutOfBoundsException.
- A new `int[5]` is filled with zeros, not left empty.