Arrays (Chapter 6)

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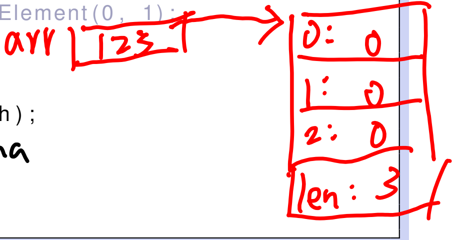
Primitive Array (1/2)

```java
public class ArrayDemo{
  public static void main(String[] arg){
    int[] arr = new int[3];
    //think: intArray arr = new intArray(3);
    arr[0] = 1; //think: arr.setElement(0, 1);
    arr[1] = 3;
    arr[2] = 5;
    arr[3] = 9;
    System.out.println(arr.length);
    arr.length = 5;
    arr = null;
  }
}
```



ohshoh

hahaha

- array is a reference by itself
- `new`, `null` like usual reference instances
- primitive array: `new` initialize element to default
- length: read-only
- index out of bound: run time error

Primitive Array (2/2)

```
public class ArrayDemo{
  public static void main(String[] arg){
    int[] arr = {1, 3, 5};
    //compare String s = "HTLin";
    System.out.println(arr.length);
  }
}
```

- construct an array instance (with automatic length calculation), then assign its address to the reference variable

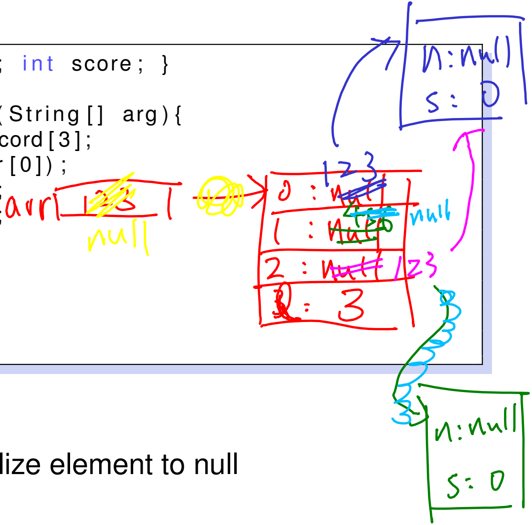
```
//try the following code and understand what happens
int[] arr = new int[3];
int[] arr2 = {1, 2};
arr = arr2;
arr = new int[] {4, 5};
```

Primitive Array: Key Point

primitive array: reference to “a batch of values”

Reference Array (1/1)

```java
class Record{ String name; int score; }
public class ArrayDemo{
  public static void main(String[] arg){
    Record[] arr = new Record[3];
    System.out.println(arr[0]);
    arr[0] = new Record();
    arr[1] = new Record();
    arr[2] = arr[0];
    arr[1] = null;
    arr = null;
  }
}
```

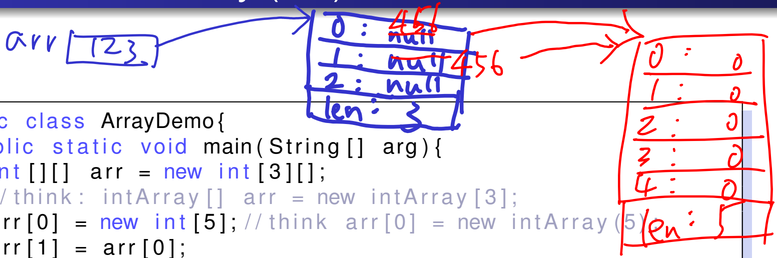


- array is a reference
- reference array: `new` initialize element to null

Reference Array: Key Point

reference array: reference to “a batch of references”

Multidimensional Array (1/3)



```
public class ArrayDemo{
  public static void main(String[] arg){
    int[][] arr = new int[3][];
    //think: intArray[] arr = new intArray[3];
    arr[0] = new int[5]; //think arr[0] = new intArray(5);
    arr[1] = arr[0];
    arr[2] = null;
    System.out.println(arr.length);
    System.out.println(arr[1].length);
  }
}
```

- multidimensional: array of “array references”
- can be irregular

Multidimensional Array (2/3)

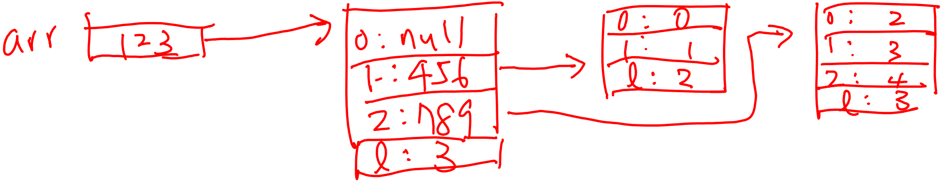
```java
public class ArrayDemo{
  public static void main(String[] arg){
    int[][] arr = new int[3][5];
    System.out.println(arr.length);
    System.out.println(arr[1].length);
  }
}
```

- still array of “array references”
- regular, automatic construction

Multidimensional Array (3/3)

```java
public class ArrayDemo{
  public static void main(String[] arg){
    int[][] arr = {null, {0, 1}, {2, 3, 4}};
    System.out.println(arr.length);
    System.out.println(arr[1].length);
  }
}
```

- construct an array, and assign its address to reference



Multidimensional Array: Key Point

multidimensional array: a special reference array, reference to “a batch of (multidimensional) arrays”