AP Computer Science A – Java

Array

Pass by Value
versus
Pass by Reference

Lecture Contents

- Passing Primitive Types (Pass By Value)
- Passing Objects (Pass By Reference)

Passing Primitive Types (Pass By Value)a

- A method does not modify a variable used as a parameter.

```
public static void main(String[] args) {
    int x = 5;
    System.out.println("Starting value: " + x);
    addOneAndPrint(x);
    System.out.println("After method: " + x);
}

public static void addOneAndPrint(int x) {
    x++;
    System.out.println("In method: " + x);
}
```

```
Starting value: 5
In method:
After method:
```

Passing Primitive Types (Pass By Value)a

- A method does not modify a variable used as a parameter.

```
public static void main(String[] args) {
    int x = 5;
    System.out.println("Starting value: " + x);
    addOneAndPrint(x);
    System.out.println("After method: " + x);
}

public static void addOneAndPrint(int x) {
    x++;
    System.out.println("In method: " + x);
}
```

```
Starting value: 5
In method: 6
After method: 5
```

Passing Objects (Pass By Reference)

- A method does not modify a variable used as a parameter.

```
public static void main(String[] args) {
   int[] a = { 1, 2, 3, 4 };
   PrintArray.printArray(a);
   addOneToElement2(a);
   PrintArray.printArray(a);
}

public static void addOneToElement2(int[] a) {
   a[2] += 1;
}
```

```
{ 1, 2, 3, 4 }
{ 1, 2, ?, 4 }
```

Passing Objects (Pass By Reference)

- A method does not modify a variable used as a parameter.

```
public static void main(String[] args) {
    int[] a = { 1, 2, 3, 4 };
    PrintArray.printArray(a);
    addOneToElement2(a);
    PrintArray.printArray(a);
}

public static void addOneToElement2(int[] a) {
    a[2] += 1;
}
```

```
{ 1, 2, 3, 4 }
{ 1, 2, 4, 4 }
```

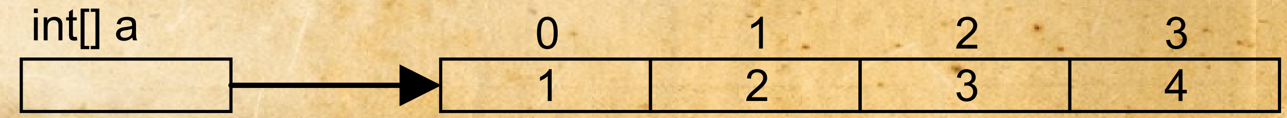
Passing Objects (Pass By Reference)

- A method does not modify a variable used as a parameter.

```
public static void main(String[] args) {
   int[] a = { 1, 2, 3, 4 };
   System.out.print(a + ": ");
   PrintArray.printArray(a);
   addOneToElement2(a);
   System.out.print(a + ": ");
   PrintArray.printArray(a);
}

public static void addOneToElement2(int[] a) {
   System.out.print(a + ": ");
   PrintArray.printArray(a);
   a[2] += 1;
}
```

```
[I@58d25a40: { 1, 2, 3, 4 }
[I@58d25a40: { 1, 2, 3, 4 }
[I@58d25a40: { 1, 2, 4, 4 }
```

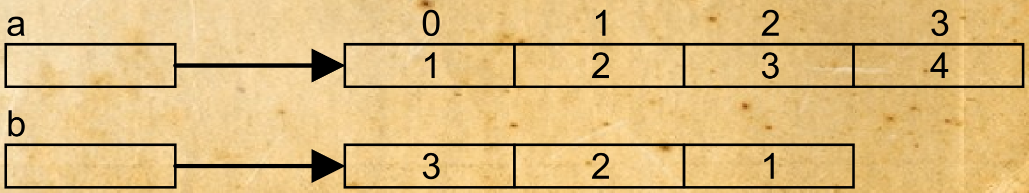


Passing Objects (Pass By Reference)

```
public static void main(String[] args) {
      int[] a = { 1, 2, 3, 4 };
   System.out.print(a + ": ");
   PrintArray.printArray(a);
   changeArray(a);
   System.out.print(a + ": ");
   PrintArray.printArray(a);
}

public static void changeArray(int[] a) {
   int[] b = { 3, 2, 1 };
   a = b;
   System.out.print(a + ": ");
   PrintArray.printArray(a);
}
```

```
[I@7e774085: { 1, 2, 3, 4 }
[I@726f3b58: { 3, 2, 1 }
[I@7e774085: { 1, 2, 3, 4 }
```



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