

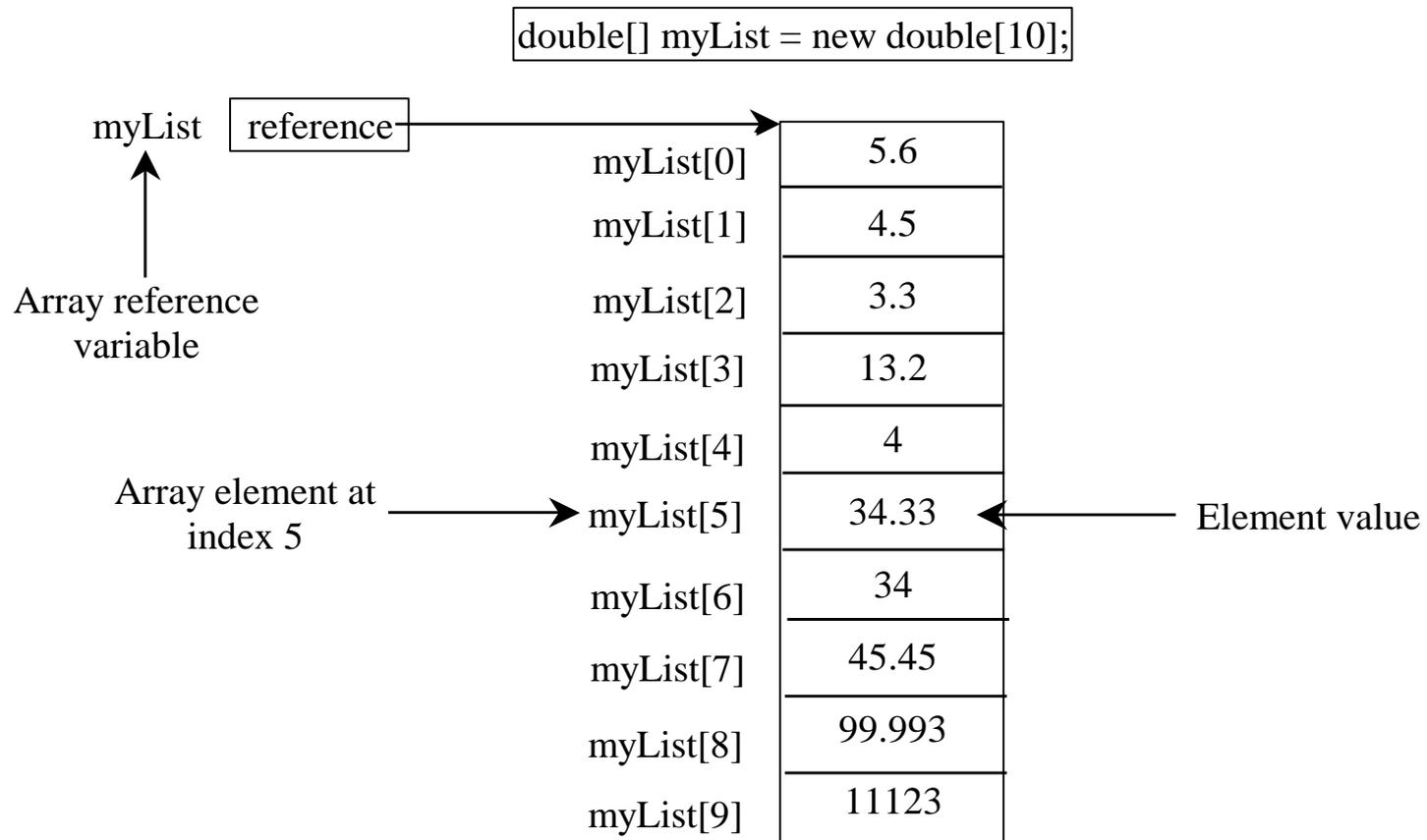
CHAPTER 6 ARRAYS

OPENING PROBLEM

Read one hundred numbers, compute their average, and find out how many numbers are above the average.

INTRODUCING ARRAYS

Array is a data structure that represents a collection of the same types of data.



DECLARING ARRAY VARIABLES

- `datatype [] arrayRefVar;`

Example:

```
double[] myList;
```

- `datatype arrayRefVar[];` // This style is allowed, but not preferred

Example:

```
double myList[];
```

CREATING ARRAYS

```
arrayRefVar = new datatype[arraySize];
```

Example:

```
myList = new double[10];
```

`myList[0]` references the first element in the array.

`myList[9]` references the last element in the array.

DECLARING AND CREATING IN ONE STEP

- `datatype[] arrayRefVar = new
datatype[arraySize];`

```
double[] myList = new double[10];
```

- `datatype arrayRefVar[] = new
datatype[arraySize];`

```
double myList[] = new double[10];
```

THE LENGTH OF AN ARRAY

Once an array is created, its size is fixed. It cannot be changed. You can find its size using

```
arrayRefVar.length
```

For example,

```
myList.length returns 10
```

DEFAULT VALUES

When an array is created, its elements are assigned the default value of

0 for the numeric primitive data types,
'\u0000' for char types, and
false for boolean types.

INDEXED VARIABLES

The array elements are accessed through the index. The array indices are *0-based*, i.e., it starts from 0 to `arrayRefVar.length-1`. In the example in Figure 6.1, `myList` holds ten double values and the indices are from 0 to 9.

Each element in the array is represented using the following syntax, known as an *indexed variable*:

```
arrayRefVar[index];
```

USING INDEXED VARIABLES

After an array is created, an indexed variable can be used in the same way as a regular variable. For example, the following code adds the value in myList[0] and myList[1] to myList[2].

```
myList[2] = myList[0] + myList[1];
```

ARRAY INITIALIZERS

- Declaring, creating, initializing in one step:

```
double[] myList = {1.9, 2.9, 3.4, 3.5};
```

This shorthand syntax must be in one statement.

DECLARING, CREATING, INITIALIZING USING THE SHORTHAND NOTATION

```
double[] myList = {1.9, 2.9, 3.4, 3.5};
```

This shorthand notation is equivalent to the following statements:

```
double[] myList = new double[4];
```

```
myList[0] = 1.9;
```

```
myList[1] = 2.9;
```

```
myList[2] = 3.4;
```

```
myList[3] = 3.5;
```

CAUTION

Using the shorthand notation, you have to declare, create, and initialize the array all in one statement. Splitting it would cause a syntax error. For example, the following is wrong:

```
double[] myList;
```

```
myList = {1.9, 2.9, 3.4, 3.5};
```

TRACE PROGRAM WITH ARRAYS

Declare array variable values, create an array, and assign its reference to values

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the array is created

0	0
1	0
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

i becomes 1

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the array is created

0	0
1	0
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

i (=1) is less than 5

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the array is created

0	0
1	0
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

After this line is executed, value[1] is 1

```
public class Test {  
    public static void main(String[] args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the first iteration

0	0
1	1
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

After i++, i becomes 2

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the first iteration

0	0
1	1
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

```
public class Test {  
    public static void  
        main(String[] args) {  
        int[] values = new int[5],  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] +  
            values[4];  
    }  
}
```

i (= 2) is less than 5

After the first iteration

0	0
1	1
2	0
3	0
4	0

TRACE PROGRAM WITH ARRAYS

After this line is executed,
values[2] is 3 (2 + 1)

```
public class Test {  
    public static void main(String[] args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the second iteration

0	0
1	1
2	3
3	0
4	0

TRACE PROGRAM WITH ARRAYS

After this, i becomes 3.

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the second iteration

0	0
1	1
2	3
3	0
4	0

TRACE PROGRAM WITH ARRAYS

i (=3) is still less than 5.

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the second iteration

0	0
1	1
2	3
3	0
4	0

TRACE PROGRAM WITH ARRAYS

After this line, values[3] becomes 6 (3 + 3)

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the third iteration

0	0
1	1
2	3
3	6
4	0

TRACE PROGRAM WITH ARRAYS

After this, i becomes 4

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the third iteration

0	0
1	1
2	3
3	6
4	0

TRACE PROGRAM WITH ARRAYS

i (=4) is still less than 5

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the third iteration

0	0
1	1
2	3
3	6
4	0

TRACE PROGRAM WITH ARRAYS

After this, values[4] becomes 10 (4 + 6)

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the fourth iteration

0	0
1	1
2	3
3	6
4	10

TRACE PROGRAM WITH ARRAYS

After i++, i becomes 5

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] +  
            values[4];  
    }  
}
```

After the fourth iteration

0	0
1	1
2	3
3	6
4	10

TRACE PROGRAM WITH ARRAYS

$i (=5) < 5$ is false. Exit the loop

```
public class Test {  
    public static void main(String[] args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i + values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

After the fourth iteration

0	0
1	1
2	3
3	6
4	10

TRACE PROGRAM WITH ARRAYS

After this line, values[0] is 11 (1 + 10)

```
public class Test {  
    public static void main(String[]  
        args) {  
        int[] values = new int[5];  
        for (int i = 1; i < 5; i++) {  
            values[i] = i * values[i-1];  
        }  
        values[0] = values[1] + values[4];  
    }  
}
```

0	11
1	1
2	3
3	6
4	10



PROCESSING ARRAYS

1. (Initializing arrays with input values)
2. (Initializing arrays with random values)
3. (Printing arrays)
4. (Summing all elements)
5. (Finding the largest element)
6. (Finding the smallest index of the largest element)
7. (*Random shuffling*)
8. (*Shifting elements*)

INITIALIZING ARRAYS WITH INPUT VALUES

```
double [ ] myList=new myList[5]
for (int i = 0; i < myList.length; i++)
    myList[i] =Double.parseDouble(JOptionPane.showInputDialog(“enter a value”));
```

INITIALIZING ARRAYS WITH RANDOM VALUES

```
for (int i = 0; i < myList.length; i++) {  
    myList[i] = Math.random() * 100;  
}
```

PRINTING ARRAYS

```
for (int i = 0; i < myList.length; i++) {  
    System.out.print(myList[i] + " ");  
}
```

SUMMING ALL ELEMENTS

```
double total = 0;
for (int i = 0; i < myList.length; i++) {
    total += myList[i];
}
```

FINDING THE LARGEST ELEMENT

```
double max = myList[0];  
for (int i = 1; i < myList.length; i++) {  
    if (myList[i] > max)  
        max = myList[i];  
}
```

ENHANCED FOR LOOP (FOR-EACH LOOP)

JDK 1.5 introduced a new for loop that enables you to traverse the complete array sequentially without using an index variable. For example, the following code displays all elements in the array myList:

```
for (double value: myList)
    System.out.println(value);
```

In general, the syntax is

```
for (elementType value: arrayRefVar) {
    // Process the value
}
```

You still have to use an index variable if you wish to traverse the array in a different order or change the elements in the array.

COPYING ARRAYS

Using a loop:

```
int[] sourceArray = {2, 3, 1, 5, 10};  
int[] targetArray = new int[sourceArray.length];  
  
for (int i = 0; i < sourceArray.length; i++)  
    targetArray[i] = sourceArray[i];
```

PASSING ARRAYS TO METHODS

```
public static void printArray(int[] array) {  
    for (int i = 0; i < array.length; i++) {  
        System.out.print(array[i] + " ");  
    }  
}
```

Invoke the method

```
int[] list = {3, 1, 2, 6, 4, 2};  
printArray(list);
```

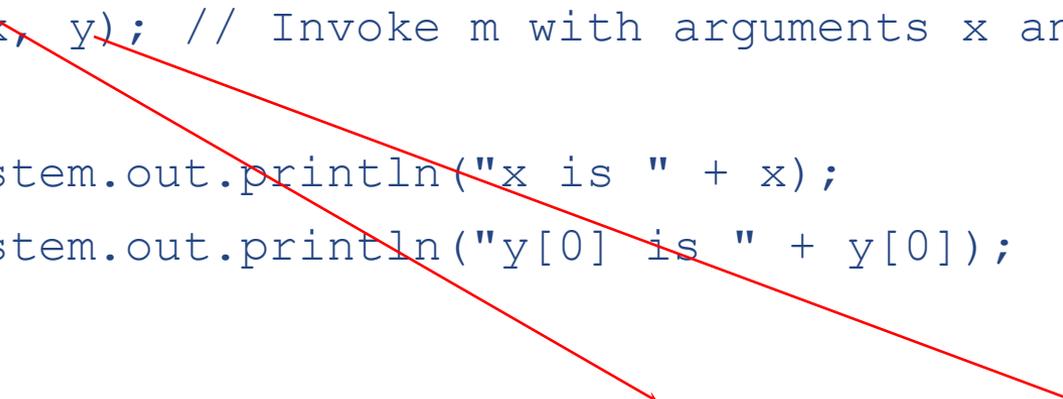
PASS BY VALUE

Java uses *pass by value* to pass arguments to a method. There are important differences between passing a value of variables of primitive data types and passing arrays.

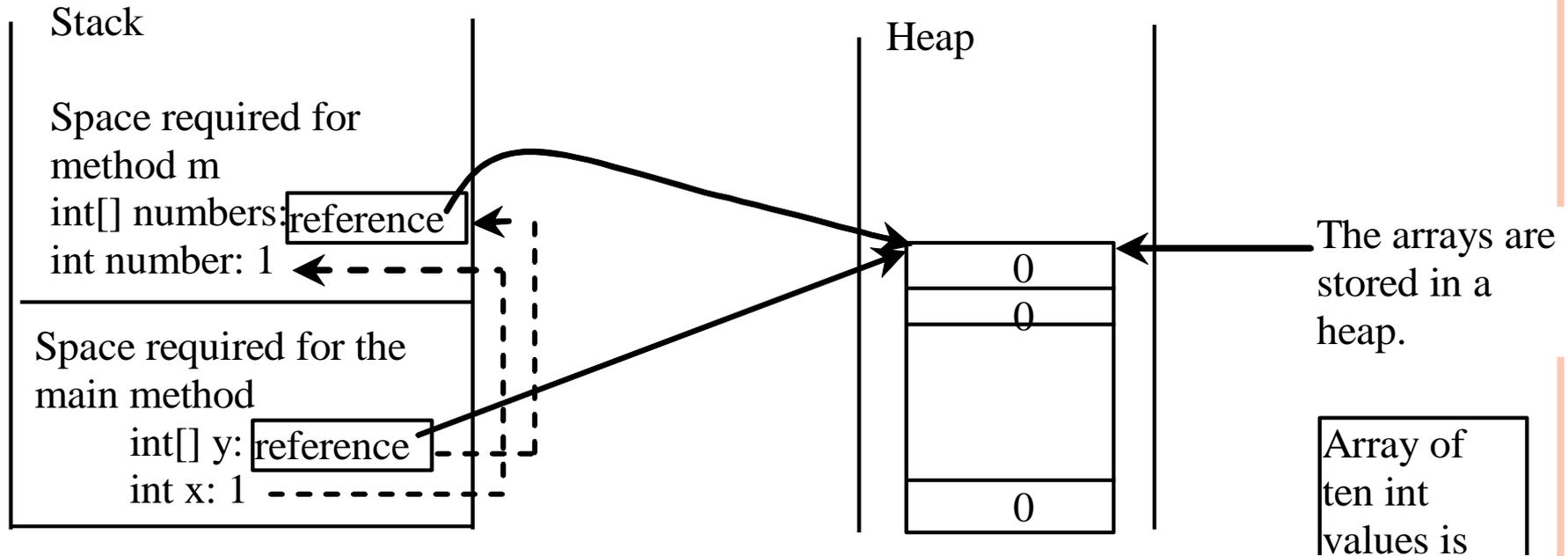
- For a parameter of a primitive type value, the actual value is passed. Changing the value of the local parameter inside the method does not affect the value of the variable outside the method.
- For a parameter of an array type, the value of the parameter contains a reference to an array; this reference is passed to the method. Any changes to the array that occur inside the method body will affect the original array that was passed as the argument.

SIMPLE EXAMPLE

```
public class Test {  
    public static void main(String[] args) {  
        int x = 1; // x represents an int value  
        int[] y = new int[10]; // y represents an array of int values  
  
        m(x, y); // Invoke m with arguments x and y  
  
        System.out.println("x is " + x);  
        System.out.println("y[0] is " + y[0]);  
    }  
  
    public static void m(int number, int[] numbers) {  
        number = 1001; // Assign a new value to number  
        numbers[0] = 5555; // Assign a new value to numbers[0]  
    }  
}
```

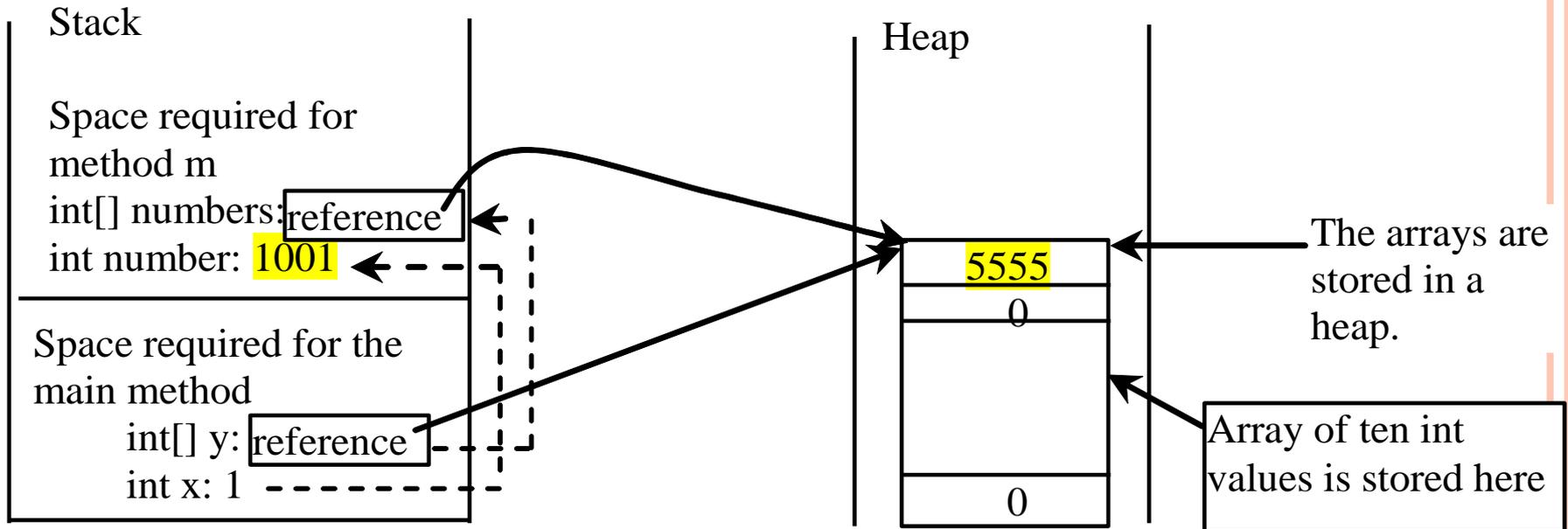


CALL STACK



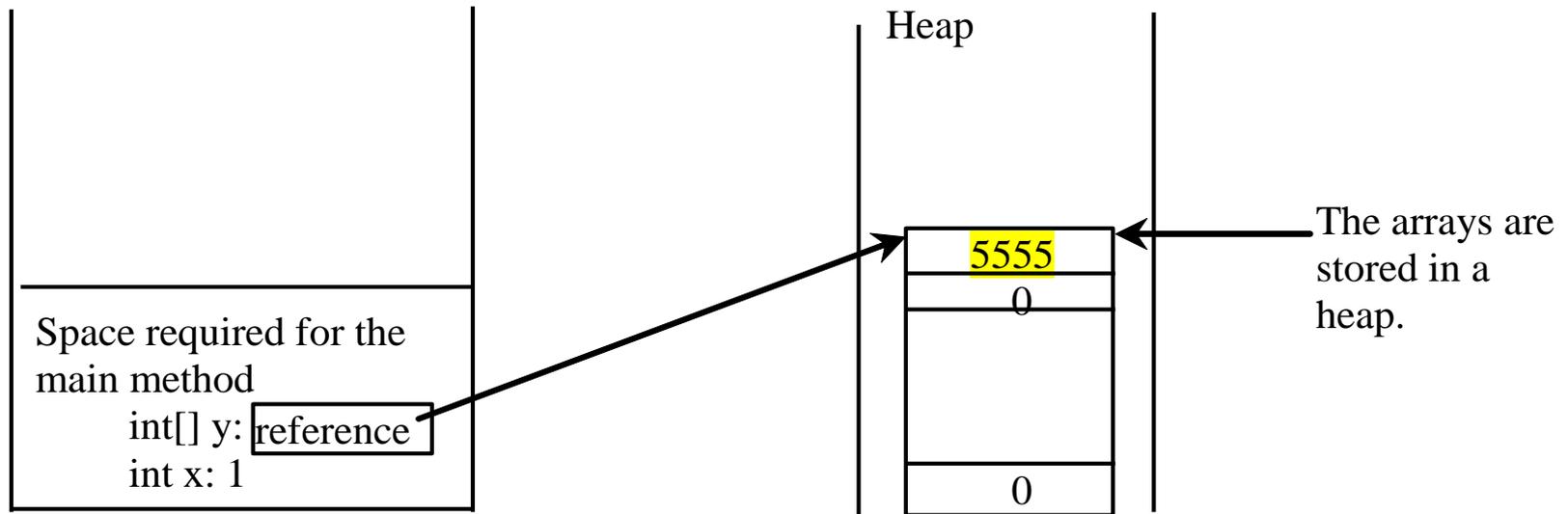
When invoking m(x, y), the values of x and y are passed to number and numbers. Since y contains the reference value to the array, numbers now contains the same reference value to the same array.

CALL STACK



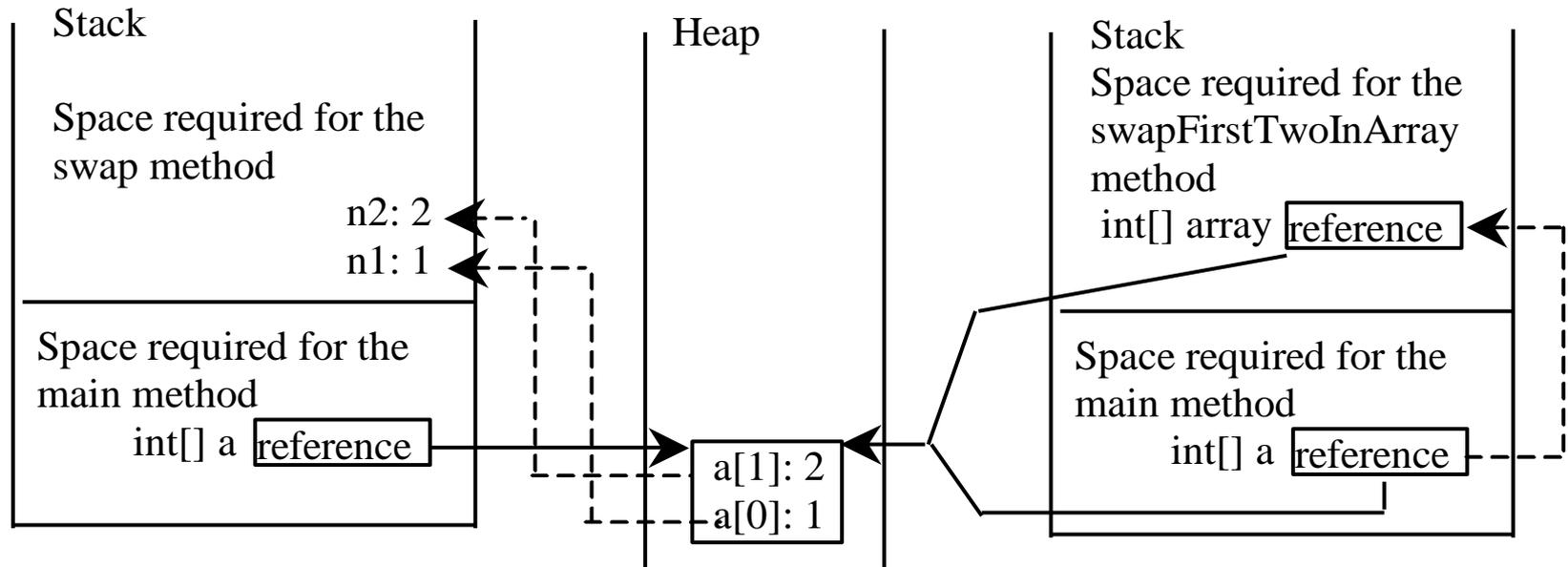
When invoking `m(x, y)`, the values of `x` and `y` are passed to `number` and `numbers`. Since `y` contains the reference value to the array, `numbers` now contains the same reference value to the same array.

HEAP



The JVM stores the array in an area of memory, called *heap*, which is used for dynamic memory allocation where blocks of memory are allocated and freed in an arbitrary order.

EXAMPLE, CONT.



Invoke `swap(int n1, int n2)`.
The primitive type values in `a[0]` and `a[1]` are passed to the `swap` method.

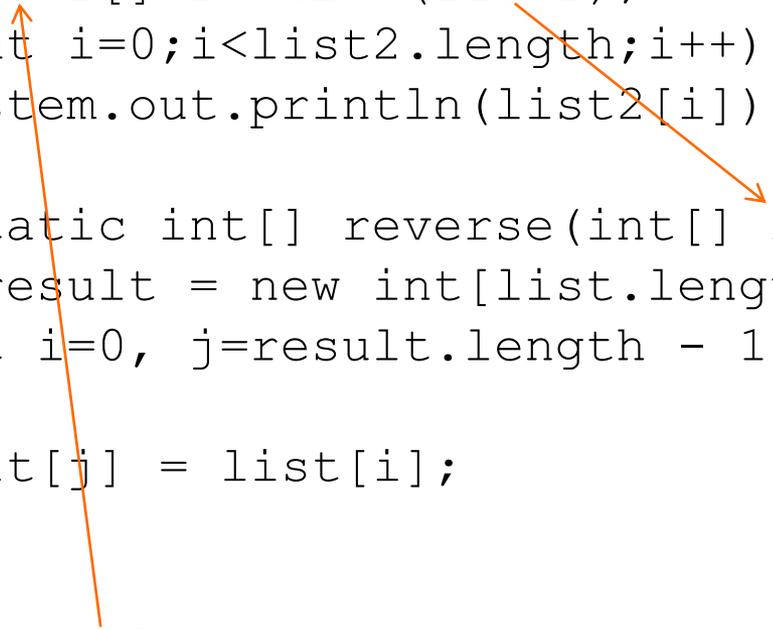
The arrays are stored in a heap.

Invoke `swapFirstTwoInArray(int[] array)`.
The reference value in `a` is passed to the `swapFirstTwoInArray` method.

RETURNING AN ARRAY FROM A METHOD

```
class A{
public static void main(String a[]){
    int list1[]={5,2,6,8};
    int list2[]=reverse(list1);
    for(int i=0;i<list2.length;i++)
        System.out.println(list2[i]);
}
public static int[] reverse(int[] list) {
    int[] result = new int[list.length];
    for(int i=0, j=result.length - 1;i < list.length; i++, j--)
    {
        result[j] = list[i];
    }

    return result;
}
}
```

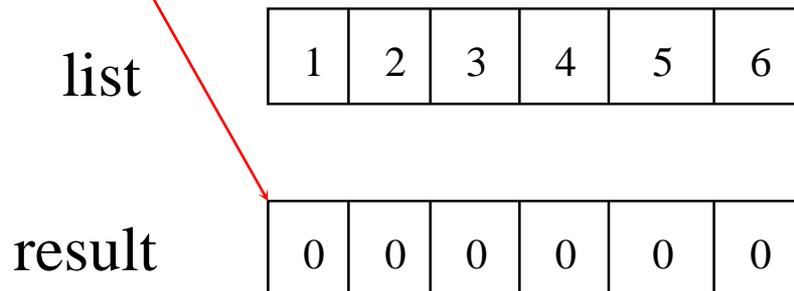


TRACE THE REVERSE METHOD

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

Declare result and create array

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1; i < list.length; i++, j--)  
    {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

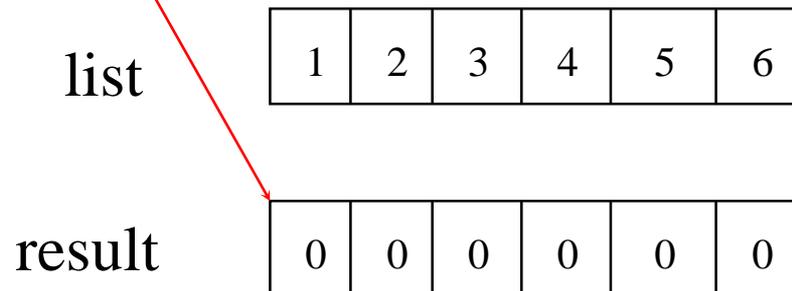


TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
    return result;  
}
```

i = 0 and j = 5

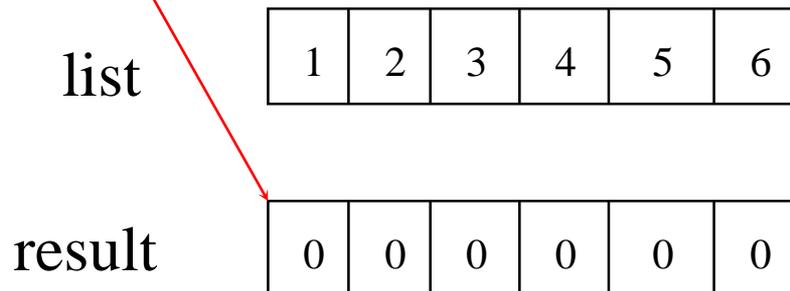


TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

i (= 0) is less than 6

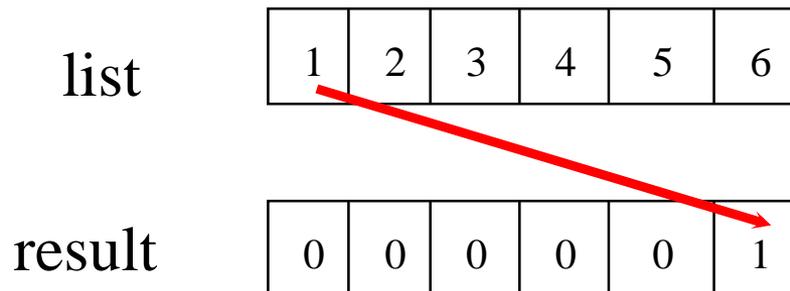


TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

$i = 0$ and $j = 5$
Assign `list[0]` to `result[5]`



TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 1 and j becomes 4

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	0	0	0	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

i (=1) is less than 6

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	0	0	0	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};
```

```
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];
```

```
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {
```

```
        result[j] = list[i];
```

```
    }
```

```
    return result;
```

```
}
```

$i = 1$ and $j = 4$
Assign `list[1]` to `result[4]`

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	0	0	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 2 and
j becomes 3

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	0	0	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

i (=2) is still less than 6

list

1	2	3	4	5	6
---	---	---	---	---	---

result

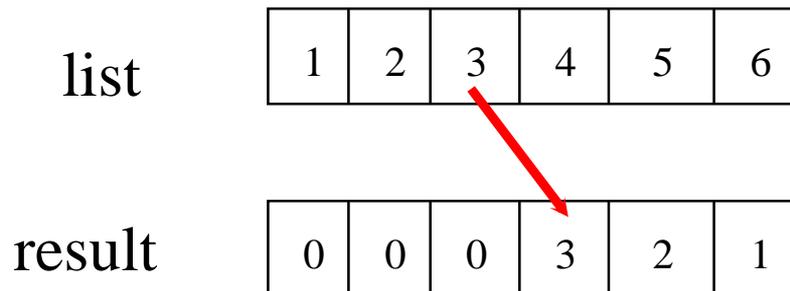
0	0	0	0	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

$i = 2$ and $j = 3$
Assign $list[i]$ to $result[j]$



TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 3 and
j becomes 2

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	0	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

i (=3) is still less than 6

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

list

1	2	3	4	5	6
---	---	---	---	---	---

result

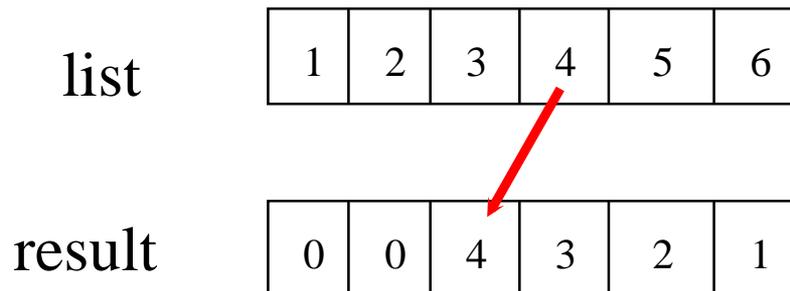
0	0	0	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

$i = 3$ and $j = 2$
Assign $list[i]$ to $result[j]$



TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 4 and
j becomes 1

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

i (=4) is still less than 6

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	0	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};
```

```
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];
```

```
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {
```

```
        result[j] = list[i];
```

```
    }
```

```
    return result;
```

```
}
```

$i = 4$ and $j = 1$
Assign $list[i]$ to $result[j]$

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 5 and
j becomes 0

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

i (=5) is still less than 6

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

list

1	2	3	4	5	6
---	---	---	---	---	---

result

0	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};
```

```
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];
```

```
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {
```

```
        result[j] = list[i];
```

```
    }
```

```
    return result;
```

```
}
```

$i = 5$ and $j = 0$
Assign $list[i]$ to $result[j]$

list

1	2	3	4	5	6
---	---	---	---	---	---

result

6	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

After this, i becomes 6 and
j becomes -1

list

1	2	3	4	5	6
---	---	---	---	---	---

result

6	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
        i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

$i (=6) < 6$ is false. So exit the loop.

list

1	2	3	4	5	6
---	---	---	---	---	---

result

6	5	4	3	2	1
---	---	---	---	---	---

TRACE THE REVERSE METHOD, CONT.

```
int[] list1 = {1, 2, 3, 4, 5, 6};  
int[] list2 = reverse(list1);
```

```
public static int[] reverse(int[] list) {  
    int[] result = new int[list.length];  
  
    for (int i = 0, j = result.length - 1;  
         i < list.length; i++, j--) {  
        result[j] = list[i];  
    }  
  
    return result;  
}
```

Return result

return result;

