

Basic Programming Practicum Job Sheet 8



From:

AL AZHAR RIZQI RIFA'I FIRDAUS

Class:

11

Absence:

01

Major:

Information Technology

Study Program:

Informatic Engineering

Experiment 1: Fill in Array Element

1. Create a new project
2. Create a new class, name it myArray

● ● ●

```
1 public class myArray {  
2  
3 }
```

3. Write the basic structure of the Java programming language which contains the main() function

● ● ●

```
1 public static void main(String[] args) {  
2  
3 }
```

4. Create an array of integer type named num with a capacity of 4 elements

● ● ●

```
1 int [] num = new int[4];
```

5. Fill each element of the array with numbers 5, 12, 7, 20



```
1 num[0] = 5;  
2 num[1] = 12;  
3 num[2] = 7;  
4 num[3] = 20;
```

6. Display all contents of the elements to the screen



```
1 System.out.println(num[0]);  
2 System.out.println(num[1]);  
3 System.out.println(num[2]);  
4 System.out.println(num[3]);
```

7. Compile and run the program. Match the results of the running programs that you have created according to the following display

5
12
7
20

Code :

```
1 public class myArray {  
2     public static void main(String[] args) {  
3  
4         int [] num = new int[4];  
5  
6         num[0] = 5;  
7         num[1] = 12;  
8         num[2] = 7;  
9         num[3] = 20;  
10  
11         System.out.println(num[0]);  
12         System.out.println(num[1]);  
13         System.out.println(num[2]);  
14         System.out.println(num[3]);  
15  
16     }  
17 }
```

Result :

```
└─(zharsuke@LAPTOP-FCSRQQ00)─[~/Documents/College/Basic Programming Practicum/Meet 10/coding]  
$ javac myArray.java && java myArray.java  
5  
12  
7  
20  
Questions!  
1. In Experiment 1, what are the largest and smallest array indexes?  
2. If the contents of each element of the array num are changed with numbers 5.0, 12867,  
7.5, 2000000. What happens? How can it be like that?  
3. Change the statement in step 6 to be like this. What is the result? How can it be like that?
```

Questions!

1. In Experiment 1, what are the largest and smallest array indexes?
2. If the contents of each element of the array num are changed with numbers 5.0, 12867, 7.5, 2000000. What happens? How can it be like that?
3. Change the statement in step 6 to be like this

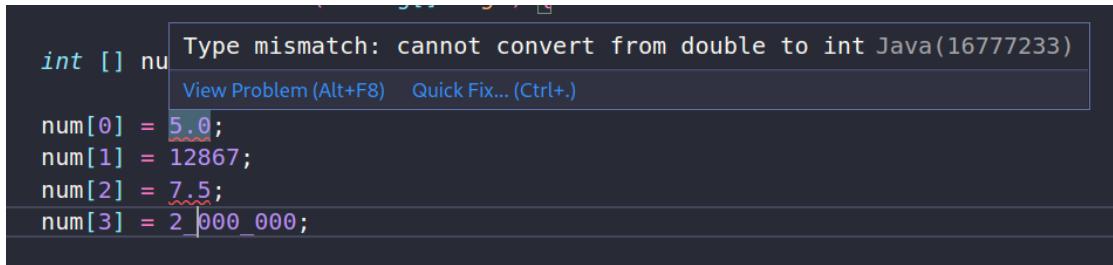
```
for (int i = 0; i < 4; i++) {  
    System.out.println(num[i]);  
}
```

What is the result? How can it be like that?

Answer

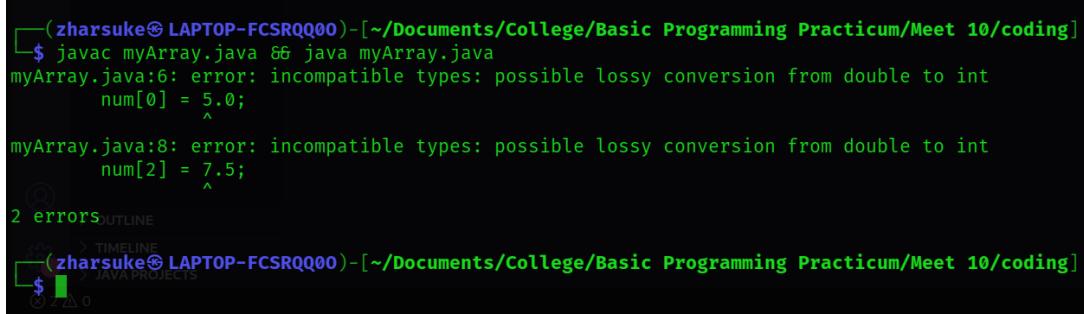
1. The smallest at index 0, and the largest at index 3

2. Code :



```
int [] num; Type mismatch: cannot convert from double to int Java(16777233)
num[0] = 5.0;
num[1] = 12867;
num[2] = 7.5;
num[3] = 2_000_000;
```

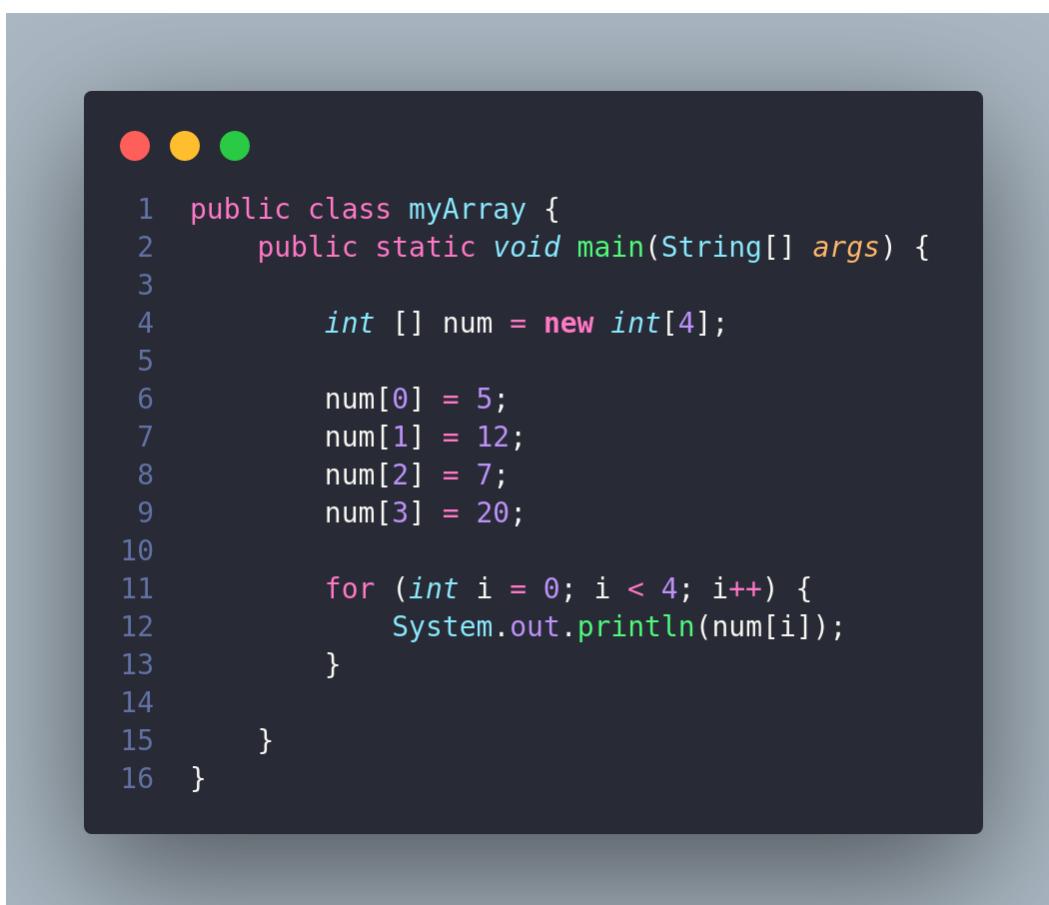
Result :



```
(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac myArray.java && java myArray.java
myArray.java:6: error: incompatible types: possible lossy conversion from double to int
    num[0] = 5.0;
               ^
myArray.java:8: error: incompatible types: possible lossy conversion from double to int
    num[2] = 7.5;
               ^
2 errors
```

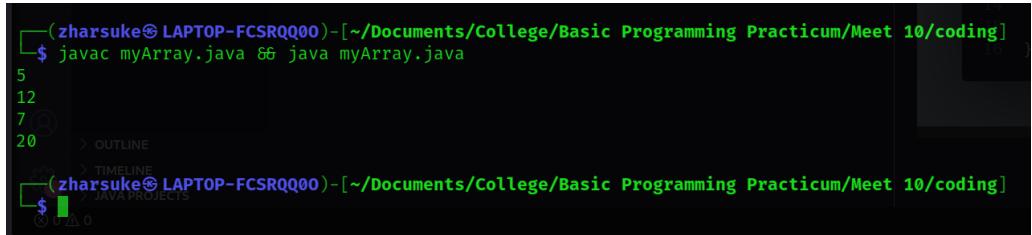
After being changed there is an error in the array index 0 and 2. The error can occur because the data type on the index is double, not integer. Because the array can only be set with only 1 data type, it cannot be more than 1.

3. Code :



```
public class myArray {
    public static void main(String[] args) {
        int [] num = new int[4];
        num[0] = 5;
        num[1] = 12;
        num[2] = 7;
        num[3] = 20;
        for (int i = 0; i < 4; i++) {
            System.out.println(num[i]);
        }
    }
}
```

Result :



```
zharsuke@LAPTOP-FCSRQQ00:~/Documents/College/Basic Programming Practicum/Meet 10/coding]$ javac myArray.java && java myArray.java
5
12
7
20
zharsuke@LAPTOP-FCSRQQ00:~/Documents/College/Basic Programming Practicum/Meet 10/coding$
```

The result is the same, but the code writing is more efficient because it uses a for loop.

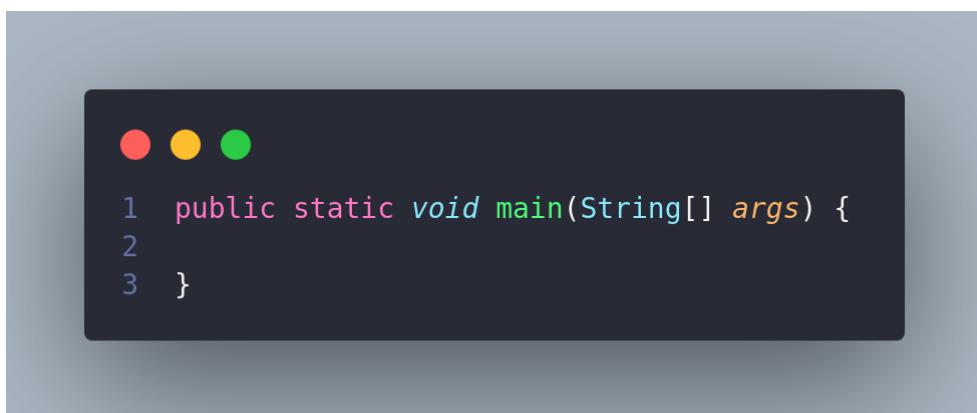
Experiment 2: Requesting User Input to Fill in an Array Element

1. Create a new class, name it arrayInputLoop



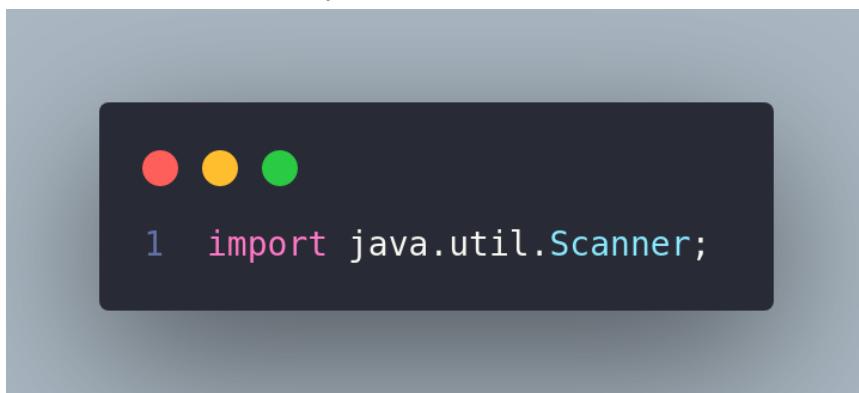
```
public class arrayInputLoop {
2
}
```

2. Write the basic structure of the Java programming language which contains the main() function



```
public static void main(String[] args) {
2
}
```

3. Add the Scanner library



```
import java.util.Scanner;
```

4. Make a Scanner declaration with the name sc

```
● ● ●  
1 Scanner sc = new Scanner(System.in);
```

5. Create an array of integer type with the name finalScore, with a capacity of 6 elements

```
● ● ●  
1 int [] finalScore = new int[6];
```

6. Using a loop, create an input to fill in the finalScore array element

```
● ● ●  
1 for (int i = 0; i < 6; i++) {  
2     System.out.print("Enter the final score " + i + " : ");  
3     finalScore[i] = sc.nextInt();  
4 }
```

7. Using a loop, display all the contents of the elements from the finalScorearray

```
● ● ●  
1 for (int i = 0; i < 6; i++) {  
2     System.out.println("Final score " + i + " is " + finalScore[i]);  
3 }
```

8. Compile and run the program. Match the results of the running programs that you have created according to the following display

```
Enter the final score 0: 88
Enter the final score 1: 90
Enter the final score 2: 74
Enter the final score 3: 83
Enter the final score 4: 92
Enter the final score 5: 77
Final score 0 is 88
Final score 1 is 90
Final score 2 is 74
Final score 3 is 83
Final score 4 is 92
Final score 5 is 77
```

Code :



```
1 import java.util.Scanner;
2
3 public class arrayInputLoop {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int [] finalScore = new int[6];
9
10        for (int i = 0; i < 6; i++) {
11            System.out.print("Enter the final score " + i + " : ");
12            finalScore[i] = sc.nextInt();
13        }
14
15        for (int i = 0; i < 6; i++) {
16            System.out.println("Final score " + i + " is " + finalScore[i]);
17        }
18
19        sc.close();
20    }
21 }
```

Result :

```

(zharsuke@LAPTOP-FCSRQQ00) [~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac arrayInputLoop.java && java arrayInputLoop.java
Enter the final score 0 : 88          Enter the final score 5: 77
Enter the final score 1 : 90          Final score 0 is 88
Enter the final score 2 : 74          Final score 1 is 90
Enter the final score 3 : 83          Final score 2 is 74
Enter the final score 4 : 92          Final score 3 is 83
Enter the final score 5 : 77          Final score 4 is 92
Final score 0 is 88                 Final score 5 is 77
Final score 1 is 90
Final score 2 is 74
Final score 3 is 83
Final score 4 is 92
Final score 5 is 77
Questions!
1. Change the statement in step 6 to be like this Run the program. Have there been any

```

Questions!

1. Change the statement in step 6 to be like this

```

for (int i = 0; i < finalScore.length; i++) {
    System.out.print("Enter the final score " + i + ": ");
    finalScore[i] = sc.nextInt();
}

```

Run the program. Have there been any changes? How can it

2. What is the use of finalScore.length?

3. Change the statement in step 7 to be like this, so that the program only displays the grades of students who passed

```

for (int i = 0; i < finalScore.length; i++) {
    if (finalScore[i]>70) {
        System.out.println("Final score " + i + " is " + finalScore[i]);
    }
}

```

Run the program and describe the flow of the program!

4. Modify the program so that it displays all students, and marked which one passed and which did not!

```

Enter the final score 0: 82
Enter the final score 1: 78
Enter the final score 2: 65
Enter the final score 3: 88
Enter the final score 4: 70
Enter the final score 5: 90
Student 0 Passed
Student 1 Passed
Student 2 Failed
Student 3 Passed
Student 4 Failed
Student 5 Passed

```

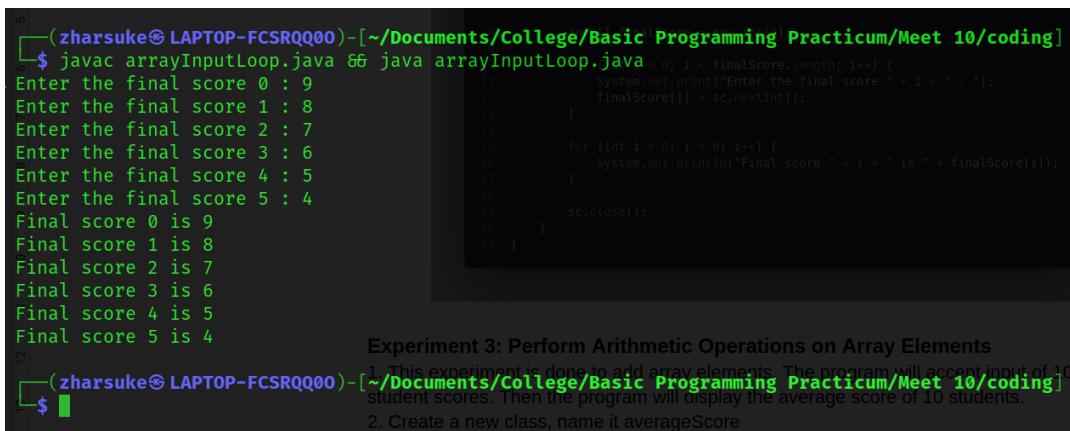
Answer

1. Code :



```
1 import java.util.Scanner;
2
3 public class arrayInputLoop {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int [] finalScore = new int[6];
9
10        for (int i = 0; i < finalScore.length; i++) {
11            System.out.print("Enter the final score " + i + " : ");
12            finalScore[i] = sc.nextInt();
13        }
14
15        for (int i = 0; i < 6; i++) {
16            System.out.println("Final score " + i + " is " + finalScore[i]);
17        }
18
19        sc.close();
20    }
21 }
```

Result :



```
[zharsuke@LAPTOP-FCSRQQ00] - [~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac arrayInputLoop.java && java arrayInputLoop.java
Enter the final score 0 : 9
Enter the final score 1 : 8
Enter the final score 2 : 7
Enter the final score 3 : 6
Enter the final score 4 : 5
Enter the final score 5 : 4
Final score 0 is 9
Final score 1 is 8
Final score 2 is 7
Final score 3 is 6
Final score 4 is 5
Final score 5 is 4
```

Experiment 3: Perform Arithmetic Operations on Array Elements

1. This experiment is done to add array elements. The program will accept input of 10 student scores. Then the program will display the average score of 10 students.

2. Create a new class, name it averageScore

When run the result is the same as before. Because the for loop conditioning is changed from 6 to finalScore.length which has the same length of 6.

2. The function of finalScore.length is to display information on the number of elements in the array.
3. Code :

```
1 import java.util.Scanner;
2
3 public class arrayInputLoop {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int [] finalScore = new int[6];
9
10        for (int i = 0; i < finalScore.length; i++) {
11            System.out.print("Enter the final score " + i + " : ");
12            finalScore[i] = sc.nextInt();
13        }
14
15        for (int i = 0; i < finalScore.length; i++) {
16            if (finalScore[i] > 70) {
17                System.out.println("Final score " + i + " is " + finalScore[i]);
18            }
19        }
20
21        sc.close();
22    }
23 }
```

Result :

```
[zarsuke@LAPTOP-FCSRQQ00] - [~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac arrayInputLoop.java && java arrayInputLoop.java
Enter the final score 0 : 90
Enter the final score 1 : 80
Enter the final score 2 : 70
Enter the final score 3 : 60
Enter the final score 4 : 50
Enter the final score 5 : 40
Final score 0 is 90
Final score 1 is 80
```

In the program above, it is looped as many times as `finalScore.length` with `finalScore.length` is 6. Then in the looping program there is a condition that the value that can be displayed only if the value is above 70, if it is not above 70 then the value will not appear.

4. Code :

```
● ● ●
1 import java.util.Scanner;
2
3 public class arrayInputLoop {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int [] finalScore = new int[6];
9
10        for (int i = 0; i < finalScore.length; i++) {
11            System.out.print("Enter the final score " + i + " : ");
12            finalScore[i] = sc.nextInt();
13        }
14
15        for (int i = 0; i < finalScore.length; i++) {
16            if (finalScore[i] > 70) {
17                System.out.println("Final score " + i + " Passed ");
18            } else {
19                System.out.println("Final score " + i + " Failed ");
20            }
21        }
22
23        sc.close();
24    }
25 }
```

Result :

```
└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac arrayInputLoop.java && java arrayInputLoop.java
Enter the final score 0 : 82          Student 0 Passed
Enter the final score 1 : 78          Student 1 Failed
Enter the final score 2 : 65          Student 2 Failed
Enter the final score 3 : 88          Student 3 Passed
Enter the final score 4 : 70          Student 4 Failed
Enter the final score 5 : 90          Student 5 Passed
Final score 0 Passed
Final score 1 Passed
Final score 2 Failed
Final score 3 Passed
Final score 4 Failed
Final score 5 Passed

└─(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$
```

Experiment 3: Perform Arithmetic Operations on Array Elements

1. This experiment is done to add array elements. The program will accept input of 10 student scores. Then the program will display the average score of 10 students.
2. Create a new class, name it averageScore

1

```
public class averageScore {  
}  
}
```

3. Write the basic structure of the Java programming language which contains the main() function

1

```
public static void main(String[] args) {  
}  
}
```

4. Add the Scanner library

1

```
import java.util.Scanner;
```

5. Make a Scanner declaration with the name sc

1

```
Scanner sc = new Scanner(System.in);
```

6. Create an array of integer type with the name score with a capacity of 10. Then declare the variables total and average

```
● ● ●  
1 int [] score = new int[10];  
2 double total = 0;  
3 double average;
```

7. Using a loop, create an input to fill in the score array element

```
● ● ●  
1 for (int i = 0; i < score.length; i++) {  
2     System.out.print("Enter student score " + (i + 1) + " : ");  
3     score[i] = sc.nextInt();  
4 }
```

8. Using a loop, calculate the total number of scores.

```
● ● ●  
1 for (int i = 0; i < score.length; i++) {  
2     total += score[i];  
3 }
```

9. Calculate the average value by dividing total by the number of elements of score



```
1 average = total / score.length;
2 System.out.println("The class average is " + average);
```

10.Compile and run the program. Match the results of the running programs that you have created according to the following display

```
Enter student score 1: 98
Enter student score 2: 73
Enter student score 3: 86
Enter student score 4: 82
Enter student score 5: 95
Enter student score 6: 68
Enter student score 7: 90
Enter student score 8: 71
Enter student score 9: 78
Enter student score 10: 84
The class average score is 82.5
```

Code :

```

1 import java.util.Scanner;
2
3 public class averageScore {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int [] score = new int[10];
9         double total = 0;
10        double average;
11
12        for (int i = 0; i < score.length; i++) {
13            System.out.print("Enter student score " + (i + 1) + " : ");
14            score[i] = sc.nextInt();
15        }
16
17        for (int i = 0; i < score.length; i++) {
18            total += score[i];
19        }
20
21        average = total / score.length;
22        System.out.println("The class average score is " + average);
23
24        sc.close();
25    }
26 }
```

Result :

```

└─(zharsuke@LAPTOP-FCSRQQ00)─[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac averageScore.java && java averageScore.java
Enter student score 1 : 98
Enter student score 2 : 73
Enter student score 3 : 86
Enter student score 4 : 82
Enter student score 5 : 95
Enter student score 6 : 68
Enter student score 7 : 90
Enter student score 8 : 71
Enter student score 9 : 78
Enter student score 10 : 84
The class average score is 82.5

└─(zharsuke@LAPTOP-FCSRQQ00)─[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$
```

Questions!

1. In step 9, why is the average calculation written outside the loop?
2. Modify the program in Experiment 3 so that it can produce output like the following display

```
Enter the number of students: 6
Enter student score 1: 75
Enter student score 2: 68
Enter student score 3: 83
Enter student score 4: 92
Enter student score 5: 88
Enter student score 6: 70
The class average score is 79.33333333333333
```

Answer

1. Because if the average calculation is placed inside the loop, then in every loop that runs the average will be calculated which results in an inaccurate calculation.
2. Code :

```
● ● ●

1 import java.util.Scanner;
2
3 public class averageScore {
4     public static void main(String[] args) {
5
6         Scanner sc = new Scanner(System.in);
7
8         int num_student;
9
10        System.out.print("Enter the number of student : ");
11        num_student = sc.nextInt();
12
13        int [] score = new int[num_student];
14        double total = 0;
15        double average;
16
17        for (int i = 0; i < score.length; i++) {
18            System.out.print("Enter student score " + (i + 1) + " : ");
19            score[i] = sc.nextInt();
20        }
21
22        for (int i = 0; i < score.length; i++) {
23            total += score[i];
24        }
25
26        average = total / score.length;
27        System.out.println("The class average score is " + average);
28
29        sc.close();
30    }
31 }
```

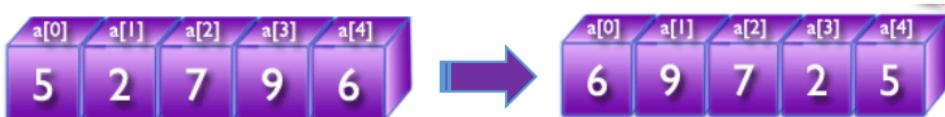
Result :

```
(zharuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac averageScore.java && java averageScore.java
Enter the number of student : 6
Enter student score 1 : 75
Enter student score 2 : 68
Enter student score 3 : 83
Enter student score 4 : 92
Enter student score 5 : 88
Enter student score 6 : 70
The class average score is 79.33333333333333

(zharuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
```

3. Assignment

1. Create a program that has an array of 5 elements. Then use the input to fill in the array elements, and display the contents of the array in reverse order as in the following illustration.



2. Create a program that accepts the number of array elements as input, also input the elements of array. Then displays the largest number of the array elements. Examples of program results are as follows:

```
Enter the number of array elements: 4
Enter the value of element 1: 27
Enter the value of element 2: 8
Enter the value of element 3: 33
Enter the value of element 4: 11
The largest number is 33
```

3. Create a program that accepts the number of array elements as input, also input the elements of array. Then displays which numbers are even and which are odd numbers. Examples of program results are as follows:

```
Enter the number of array elements: 6
Enter the value of element 1: 7
Enter the value of element 2: 3
Enter the value of element 3: 5
Enter the value of element 4: 8
Enter the value of element 5: 2
Enter the value of element 6: 1
Even number: 8
Even number: 2
Odd number: 7
Odd number: 3
Odd number: 5
Odd number: 1
```

Answer :

1. Code :

```
1 import java.util.*;
2
3 public class ass1 {
4     public static void main(String[] args) {
5
6         Scanner scanner = new Scanner(System.in);
7         int element;
8
9         System.out.print("Insert amount of array element : ");
10        element = scanner.nextInt();
11
12        int [] num = new int[element];
13
14        System.out.println();
15
16        for (int i = 0; i < num.length; i++) {
17            System.out.print("Insert number from index " + i + " : ");
18            num[i] = scanner.nextInt();
19        }
20
21        System.out.println();
22
23        for (int i = 0; i < num.length; i++) {
24            System.out.print(num[i] + " ");
25        }
26
27        System.out.println();
28
29        for (int i = num.length-1; i >= 0; i--) {
30            System.out.print(num[i] + " ");
31        }
32
33        scanner.close();
34    }
35 }
```

Result :

```
(zharsuke@LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac ass1.java && java ass1.java
Insert amount of array element : 5
5 2 7 9 6 → 6 9 7 2
2. Create a program that accepts the number of array elements as
input the elements of array. Then displays the largest number
elements. Examples of program results are as follows:
Enter the number of array elements: 4
Enter the value of element 1: 27
Enter the value of element 2: 28
Enter the value of element 3: 33
$
```

2. Code :

```

1 import java.util.*;
2
3 public class ass2 {
4     public static void main(String[] args) {
5
6         Scanner scanner = new Scanner(System.in);
7         int element;
8
9         System.out.print("Enter the number of array elements : ");
10        element = scanner.nextInt();
11
12        int [] num = new int[element];
13
14        System.out.println();
15
16        for (int i = 0; i < num.length; i++) {
17            System.out.print("Enter the value of element : ");
18            num[i] = scanner.nextInt();
19        }
20
21        System.out.println();
22
23        int max = num[0];
24
25        for (int i = 0; i < num.length; i++) {
26            if (num[i] > max) {
27                max = num[i];
28            }
29            System.out.print(num[i] + " ");
30        }
31
32        System.out.println();
33        System.out.println();
34
35        System.out.println("The largest number is " + max);
36
37        scanner.close();
38    }
39 }

```

Result :

```

[zharsuke@LAPTOP-FCSRQQ00]-(~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac ass2.java && java ass2.java      Enter the value of element 2: 8
Enter the number of array elements : 4      Enter the value of element 3: 33
                                              Enter the value of element 4: 11
                                              Enter the value of element 1: 27
                                              Enter the value of element 0: 8
                                              Enter the value of element 3: 33
                                              Enter the value of element 2: 11
                                              Enter the value of element 1: 27
                                              Enter the value of element 0: 8
                                              The largest number is 33
                                              27 8 33 11
                                              The largest number is 33
[zharsuke@LAPTOP-FCSRQQ00]-(~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ 

```

3. Create a program that accepts the number of array elements as input and displays all the elements of array. Then displays which elements are odd numbers. Examples of program results are as follows:

3. Code :

```

1 import java.util.*;
2
3 public class ass3 {
4     public static void main(String[] args) {
5
6         Scanner scanner = new Scanner(System.in);
7         Integer element;
8
9         System.out.print("Enter the number of array element : ");
10        element = scanner.nextInt();
11
12        Integer [] num = new Integer[element];
13
14        System.out.println();
15
16        for (int i = 0; i < num.length; i++) {
17            System.out.print("Enter the value of element " + i + " : ");
18            num[i] = scanner.nextInt();
19        }
20
21        System.out.println();
22
23        Arrays.sort(num, Collections.reverseOrder());
24        // System.out.println(Arrays.toString(num));
25
26        for (int i = 0; i < num.length; i++) {
27            if (num[i] % 2 == 0) {
28                System.out.println("Even number : " + num[i]);
29            }
30        }
31
32        for (int i = 0; i < num.length; i++) {
33            if (num[i] % 2 != 0) {
34                System.out.println("Odd number : " + num[i]);
35            }
36        }
37
38        scanner.close();
39    }
40 }

```

Result :

```

[zharsuke@LAPTOP-FCSRQQ00] - [~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ javac ass3.java && java ass3.java
Enter the number of array element : 6
Enter the value of element 5: 2
Enter the value of element 6: 1
Enter the value of element 0 : 7
Enter the value of element 1 : 3
Enter the value of element 2 : 5
Enter the value of element 3 : 8
Enter the value of element 4 : 2
Enter the value of element 5 : 1
Even number : 8
Even number : 2
Odd number : 7
Odd number : 5
Odd number : 3
Odd number : 1
Odd number : 5
Odd number : 1

Basic Programming Teaching Team
Politeknik Negeri Malang

[zharsuke@LAPTOP-FCSRQQ00] - [~/Documents/College/Basic Programming Practicum/Meet 10/coding]
$ █

```