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Лабораторна робота №4
із дисципліни «Програмування. Частина 1. Основи програмування»
Тема: «Масиви»

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Варіант-5
Хід роботи:
5)

1. Код програми:

```
1 package lab4;
2
3 /**
4  * Lab 4, Task 5
5  *
6  * @author Kiiko Anna
7  */
8 public class Lab4_Task5 {
9
10     /**
11      * Entry point. Tests the method {@code task5(...)} by calling the helper
12      * method {@code printResults(m)} few times with different arguments.
13      *
14      * @param args the standart parameter of the function.
15      */
16     public static void main(String[] args) {
17         printResults(new double[] {});
18         printResults(new double[] {1, 2, 4, 7, 8});
19         printResults(new double[] {1, 2, 3, 4, -3, -7, 0});
20         printResults(m: null);
21     }
22
23     /**
24      * Returns the value for the array according to formula from the task
25      *
26      * @param m the parameter of the function.
27      * @return the elements sum according to formula from the task.
28      * @exception NullPointerException if array is null
29      * @exception IllegalArgumentException if array is empty
30      */
31     public static double task5(double[] m) {
32         if (null == m) {
33             throw new NullPointerException(s: "The array is null!");
34         }
35         if (m.length == 0) {
36             throw new IllegalArgumentException(s: "The array is empty!");
37         }
38         double sumRow = 0;
39         for (double iterVal : m)
40         {
41             if (iterVal < 0) {
42                 sumRow += iterVal;
43             }
44         }
45         return sumRow;
46     }
47
48     /**
49      * Helper method for printing result of {@code task5(m)}.
50      *
51      * @param m the parameter of the function.
52      */
53     static void printResults(double[] m) {
54         System.out.print(s: "For { ");
55         if (m != null) {
56             for(double i : m) {
57                 System.out.print(i + " ");
58             }
59         } else {
60             System.out.print(s: "NULL ");
61         }
62         System.out.print(s: "} result: ");
63         try {
64             System.out.println(task5(m));
65         } catch (Exception ex) {
66             System.out.println("EXCEPTION! " + ex.getMessage());
67         }
68     }
69 }
```

2. Результати:

```
C:\Users\Kirkland> java -cp C:\Users\Kirkland\AppData\Local\Temp\VSCode...
For { } result: EXCEPTION! The array is empty!
For { 1.0 2.0 4.0 7.0 8.0 } result: 0.0
For { 1.0 2.0 3.0 4.0 -3.0 -7.0 0.0 } result: -10.0
For { NULL } result: EXCEPTION! The array is null!
PS C:\Users\Kirkland>
```

35)

1. Код програми:

```
1 package lab4;
2
3 /**
4  * Lab 4, Task 35
5  *
6  * @author Kiiko Anna
7  */
8 public class Lab4_Task35 {
9
10     /**
11      * Entry point. Tests the method {@code task35(...)} by calling the helper
12      * method {@code printResults(m)} few times with different arguments.
13      *
14      * @param args the standart parameter of the function.
15      */
16     public static void main(String[] args) {
17         printResults(new double[] {});
18         printResults(new double[] {1, 2, 4, 7, 8});
19         printResults(new double[] {1, 2, 3, 4, -3, -7, 0});
20         printResults(new double[] {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11});
21         printResults(new double[] {1, 2, 3, 4, -5, -6, -7, -8, -9, -10, -11});
22         printResults(new double[] {0, 1, 2, 3, 4, 0, 0, 0, 0, 0, 15});
23         printResults(m: null);
24     }
25
26     /**
27      * Returns the value for the array according to formula from the task
28      * Special cases:
29      * If the array not contain elements with the index [5;10], then
30      * exception IndexOutOfBoundsException is thrown.
31      *
32      * @param m the parameter of the function.
33      * @return the sum according to formula from the task.
34      * @exception NullPointerException if array is null
35      * @exception IllegalArgumentException if array is empty
36      * @exception IndexOutOfBoundsException if array not contain elements with the index [5;10]
37      */
38     public static double task35(double[] m) {
39         if (null == m) {
40             throw new NullPointerException(s: "The array is null!");
41         }
42         if (m.length == 0) {
43             throw new IllegalArgumentException(s: "The array is empty!");
44         }
45         if (m.length < 11) {
46             throw new IllegalArgumentException(s: "The array is not contain elements with the index [5;10]!");
47         }
48         double sumRow = 0;
49         for (int indexArray = 0; indexArray < m.length; ++indexArray) {
50             if ((indexArray >= 5) && (indexArray <= 10)) {
51                 sumRow += m[indexArray];
52             }
53         }
54         return sumRow;
55     }
56
57     /**
58      * Helper method for printing result of {@code task35(m)}.
59      *
60      * @param m the parameter of the function.
61      */
62     static void printResults(double[] m) {
63         System.out.print(s: "For { ");
64         if (m != null) {
65             for (double i : m) {
66                 System.out.print(i + " ");
67             }
68         } else {
69             System.out.print(s: "NULL ");
70         }
71         System.out.print(s: "} result: ");
```

```

72     try {
73         System.out.println(task35(m));
74     } catch (Exception ex) {
75         System.out.println("EXCEPTION! " + ex.getMessage());
76     }
77 }
78 }
79

```

2. Результаты:

```

For { } result: EXCEPTION! The array is empty!
For { 1.0 2.0 4.0 7.0 8.0 } result: EXCEPTION! The array is not contain elements with the index [5;10]!
For { 1.0 2.0 3.0 4.0 -3.0 -7.0 0.0 } result: EXCEPTION! The array is not contain elements with the index [5;10]!
For { 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 } result: 51.0
For { 1.0 2.0 3.0 4.0 -5.0 -6.0 -7.0 -8.0 -9.0 -10.0 -11.0 } result: -51.0
For { 0.0 1.0 2.0 3.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 15.0 } result: 0.0
For { NULL } result: EXCEPTION! The array is null!
PS C:\Users\Kirkland>

```

65)

1. Код програми:

```

1 package lab4;
2
3 /**
4  * Lab 4, Task 65
5  *
6  * @author Kiiko Anna
7  */
8 public class Lab4_Task65 {
9
10     /**
11      * Entry point. Tests the method {@code task65(...)} by calling the helper
12      * method {@code printResults(m)} few times with different arguments.
13      *
14      * @param args the standart parameter of the function.
15      */
16     public static void main(String[] args) {
17         printResults(new int[] {});
18         printResults(new int[] {1, 2, 4, 7, 8});
19         printResults(new int[] {1, 2, 3, 4, -3, -7, 0});
20         printResults(new int[] {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11});
21         printResults(new int[] {1, 2, 3, 4, -5, -6, -7, -8, -9, -10, -11});
22         printResults(new int[] {0, 1, 2, 3, 4, 0, 0, 0, 0, 0, 0, 15});
23         printResults(m: null);
24     }
25
26     /**
27      * Returns the value for the array according to formula from the task
28      *
29      * @param m the parameter of the function.
30      * @return the sum according to formula from the task.
31      * @exception NullPointerException if array is null
32      */
33     public static int[] task65(int[] m) {
34         if (null == m) {
35             throw new NullPointerException(s: "The array is null!");
36         }
37     }
38 }

```

```

37     int[] resultArray = new int[m.length];
38     int maxIndex = m.length - 1;
39     for (int indexArray = 0; indexArray <= maxIndex; ++indexArray)
40     |     resultArray[indexArray] = m[maxIndex - indexArray];
41     }
42     return resultArray;
43 }
44
45 /**
46  * Helper method for printing result of {@code task65(m)}.
47  *
48  * @param m the parameter of the function.
49  */
50 static void printResults(int[] m) {
51     System.out.print(s: "For { ");
52     if (m != null) {
53         for(int i : m) {
54             System.out.print(i + " ");
55         }
56     } else {
57         System.out.print(s: "NULL ");
58     }
59     System.out.print(s: "} result: { ");
60     try {
61         int[] t = task65(m);
62         for(int i : t) {
63             System.out.print(i + " ");
64         }
65         System.out.println(x: "});
66     } catch (Exception ex) {
67         System.out.println("EXCEPTION! " + ex.getMessage());
68     }
69 }
70 }

```

2. Результати:

```

For { } result: { }
For { 1 2 4 7 8 } result: { 8 7 4 2 1 }
For { 1 2 3 4 -3 -7 0 } result: { 0 -7 -3 4 3 2 1 }
For { 1 2 3 4 5 6 7 8 9 10 11 } result: { 11 10 9 8 7 6 5 4 3 2 1 }
For { 1 2 3 4 -5 -6 -7 -8 -9 -10 -11 } result: { -11 -10 -9 -8 -7 -6 -5 4 3 2 1 }
For { 0 1 2 3 4 0 0 0 0 0 0 15 } result: { 15 0 0 0 0 0 0 4 3 2 1 0 }
For { NULL } result: { EXCEPTION! The array is null!
PS C:\Users\Kirkland>

```

Висновок: ознайомилися з принципами роботи з масивами, використанням Exceptions. Повторили використання циклів тощо.