Due to the print book page limit, we cannot inlcude all good CheckPoint questions in the physical book. The CheckPoint on this Website may contain extra questions not printed in the book. The questions in some sections may have been reordered as a result. Nevertheless, it is easy to find the CheckPoint questions in the book on this Website. Please send suggestions and errata to Dr. Liang at y.daniel.liang@gmail.com. Indicate the book, edition, and question number in your email. Thanks!

Chapter 8 Check Point Questions

Section 8.2

▼8.2.1

Declare an array reference variable for a two-dimensional array of int values, create a 4 × 5 int matrix, and assign it to the variable.

int[][] m = new int[4][5];

Hide Answer Read Answer

▼8.2.2

Can the rows in a two-dimensional array have different lengths?

Yes. They are ragged array.

Hide Answer Read Answer

▼8.2.3

What is the output of the following code?

```
int[][] array = new int[5][6];
int[] x = {1, 2};
array[0] = x;
System.out.println("array[0][1] is " + array[0][1]);
```

```
array[0][1] is 2.
```

Hide Answer Read Answer

▼8.2.4

Which of the following statements are valid?

```
int[][] r = new int[2];
int[] x = new int[];
int[][] y = new int[3][];
int[][] z = {{1, 2}};
int[][] m = {{1, 2}, {2, 3}};
int[][] n = {{1, 2}, {2, 3}, };
```

```
int[][] r = new int[2];
Answer: Invalid

int[] x = new int[];
Answer: Invalid

int[][] y = new int[3][];
Answer: Valid
```

```
int[][] z = {{1, 2}};
Answer: Valid

int[][] m = {{1, 2}, {2, 3}};
Answer: Valid

int[][] n = {{1, 2}, {2, 3}, };
Answer: invalid
```

Hide Answer Read Answer

Section 8.3

▼8.3.1

Show the output of the following code:

```
int[][] array = {{1, 2}, {3, 4}, {5, 6}};
for (int i = array.length - 1; i >= 0; i--) {
  for (int j = array[i].length - 1; j >= 0; j--)
    System.out.print(array[i][j] + " ");
  System.out.println();
}
```

```
6 5
4 3
2 1
```

Hide Answer Read Answer

▼8.3.2

Show the output of the following code:

```
int[][] array = {{1, 2}, {3, 4}, {5, 6}};
int sum = 0;
for (int i = 0; i < array.length; i++)
  sum += array[i][0];
System.out.println(sum);
```

```
9
```

Hide Answer Read Answer

Section 8.4

▼8.4.1

Show the output of the following code:

```
public class Test {
  public static void main(String[] args) {
    int[][] array = {{1, 2, 3, 4}, {5, 6, 7, 8}};
    System.out.println(m1(array)[0]);
    System.out.println(m1(array)[1]);
  }
```

```
  public static int[] m1(int[][] m) {
    int[] result = new int[2];
    result[0] = m.length;
    result[1] = m[0].length;
    return result;
  }
}
```

2
4

Hide Answer Read Answer

Section 8.5

▼8.5.1

8.5.1 How do you modify the code so that it also displays the highest count and the student with the highest count?

Introduce variabls highestCount and studentNumberOfHighestCount with initial values -1 and -1. Once a new count is obtained for a student, update highestCount and studentNumberOfHighestCount if the new count is larger than highestCount.

Hide Answer Read Answer

Section 8.6

▼8.6.1

What happens if the input has only one point?

There will be a runtime exception in lines 19-20 when it references points[p2][0] for p2 is 1.

Hide Answer Read Answer

Section 8.7

▼8.7.1

What happens if the code in line 51 in Listing 8.4 is changed to

```
if (row != i && col != j && grid[row][col] == grid[i][j])
```

The code in lines 49-52 checks if there is another cell in the 3 by 3 box for grid[i][j] that contains the same value as grid[i][j]. It tests each cell at (row, col) in this 3 by 3 box to see if grid[row][col] == grid[i][j] except the cell at (i, j). This 3 by 3 box has nine cells. Since grid[i][j] itself needs to be excluded, we need to check eight cells. If the code is changed like this, you will only check four cells because the cells in the same row as i would not be checked and the cells in the same column as j would not be checked. The correct code is

```
if (!(row == i && col == j) && grid[row][col] == grid[i][j])
```

This checks every cell in the 3 by 3 box except the cell for grid[i][j] itself.

Acknowledgement: This checkpoint question is created from an error in the previous edition of the book.Thanks to Matthew Krenik (ETH Zurich) for reporting this error.

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Section 8.8

▼8.8.1

Declare an array variable for a three-dimensional array, create a 4 × 6 × 5 int array, and assign its reference to the variable.

```
int[][][] m = new int[4][6][5];
```

Hide Answer Read Answer

▼8.8.2

Assume char[][][] x = new char[12][5][2], how many elements are in the array? What are x.length, x[2].length, and x[0][0].length?

120
x.length is 12
x[2].length is 5
x[0][0].length is 2

Hide Answer Read Answer

▼8.8.3

Show the output of the following code:

```
int[][][] array = {{{1, 2}, {3, 4}}, {{5, 6},{7, 8}}};
System.out.println(array[0][0][0]);
System.out.println(array[1][1][1]);
```

```
1
8
```

Hide Answer Read Answer