

**Unit 8 2D Arrays - Practice Set 1 - Exam is Friday 3/17!**

1. Consider the following code segment.

```
int[][] anArray = new int[10][8];

for (int j = 0; j < 8; j++)
{
    for (int k = 0; k < 10; k++)
    {
        anArray[j][k] = 5;
    }
}
```

The code segment causes an `ArrayIndexOutOfBoundsException` to be thrown. How many elements in `anArray` will be set to 5 before the exception is thrown?

- (A) 0
- (B) 8
- (C) 9
- (D) 64
- (E) 80

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2. Assume `mat` is defined as follows.

```
int dim = 4;
```

```
int[][] mat = new int[dim][dim];
```

Consider the following code segment.

```
int sum = 0;
```

```
for (int row = 0; row < dim; row++)
```

```
{
```

```
    sum = sum + mat[row][dim - 1];
```

```
}
```

Assume that `mat` contains the following values before the code segment is executed. Note that `mat[0][3]` is 2.

|   | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 1 | 1 | 2 | 2 |
| 1 | 1 | 2 | 2 | 4 |
| 2 | 1 | 3 | 2 | 6 |
| 3 | 1 | 4 | 2 | 8 |

What value will `sum` contain after the code segment is executed?

- (A) 6
- (B) 8
- (C) 13
- (D) 15
- (E) 20

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3. Consider the following method, which is intended to return the number of columns in the two-dimensional array `arr` for which the sum of the elements in the column is greater than the parameter `val`.

```
public int countCols(int[][] arr, int val)
{
    int count = 0;

    for (int col = 0; col < arr[0].length; col++) // Line 5
    {
        int sum = 0;
        for (int[] row : col) // Line 8
        {
            sum += row[col]; // Line 10
        }
        if (sum > val)
        {
            count++;
        }
    }
    return count;
}
```

The `countCols` method does not work as intended. Which of the following changes should be made so the method works as intended?

- (A) Line 5 should be changed to `for (int col = 0; col < arr.length; col++)`
- (B) Line 8 should be changed to `for (int row : col)`
- (C) Line 8 should be changed to `for (int[] row : arr)`
- (D) Line 10 should be changed to `sum += arr[col];`
- (E) Line 10 should be changed to `sum += arr[row][col];`

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4. Consider the following method, which is intended to return the element of a 2-dimensional array that is closest in value to a specified number, `val`.

```
/** @return the element of 2-dimensional array mat whose value is closest to val */
public double findClosest(double[][] mat, double val)
{
    double answer = mat[0][0];
    double minDiff = Math.abs(answer - val);
    for (double[] row : mat)
    {
        for (double num : row)
        {
            if ( /* missing code */ )
            {
                answer = num;
                minDiff = Math.abs(num - val);
            }
        }
    }
    return answer;
}
```

Which of the following could be used to replace `/* missing code */` so that `findClosest` will work as intended?

- (A) `val - row[num] < minDiff`
- (B) `Math.abs(num - minDiff) < minDiff`
- (C) `val - num < 0.0`
- (D) `Math.abs(num - val) < minDiff`
- (E) `Math.abs(row[num] - val) < minDiff`

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5. Consider the following code segment.

```
int[] oldArray = {1, 2, 3, 4, 5, 6, 7, 8, 9};

int[][] newArray = new int[3][3];

int row = 0; int col = 0;

for (int index = 0; index < oldArray.length; index++)

{

    newArray[row][col] = oldArray[index]; row++;

    if ((row % 3) == 0)

    {

        col++;

        row = 0;

    }

}
```

System.out.println(newArray[0][2]);

What is printed as a result of executing the code segment?

- (A) 3
- (B) 4
- (C) 5
- (D) 7
- (E) 8