**AP CS Test – Review**

Test04 will cover the following general topics: **two-dimensional arrays of all types, for-each loops,** and any topics covered on previous tests.The following are examples of the types of problems you might find on the test. **Solutions can be found at the end of this document.**

1. **What is the output of the following code?**

int[][] matrix = {{2, 3, 4}, {5, 6, 7}, {8, 9, 0}};

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

1. **What values will the** nums **array store after the following loops runs?**

double[][] nums = new double[4][4];

for (int i = 0; i < nums.length; i++)

{

for (int j = 0; j < nums[i].length; j++)

{

nums[i][j] = i;

}

}

1. **What is the output of the following code?**

int[][] nums = {{2, 4, 8}, {16, 32, 64}, {128}};

System.out.println(nums[1][nums[0][0]]);

1. **What is the algorithmic function of the following method?**

public int[][] alter(int[][] mat, int c)

{

for (int i = 0; i < mat.length; i++) {

for (int j = c; j < mat[0].length; j++) {

mat[i][j-1] = mat[i][j];

}

}

return mat;

}

1. **What is the algorithmic function of the following method?**

public int[][] alter(int[][] mat, int c)

{

for (int i = 0; i < mat.length; i++) {

for (int j = c; j < mat[i].length; j++) {

mat[i][j] = mat[i][j] + 1;

}

}

return mat;

}

1. **Assuming the following class exists, what type of value could replace** <#1>**?**

Something[][] s = new Something[3][4];

s[0][4] = <#1>;

1. **What is the output of the following code?**

int[][] xMat = {{3,1,7,5}, {0,8,7,3}, {9,6,4,2}};

for (int r = 0; r < xMat.length; r++)

for (int c = 0; c < xMat[r].length / 2; c++)

xMat[r][c] = xMat[c][r];

System.out.println(xMat[1][1]);

1. **What is the output of the following code?**

int[][] m = {{1,1,1},{2,2,2},{3,3,3},{4,4,4}};

int height = m.length;

int width = m[0].length;

for (int c = 0; c < width; c++)

{

int midIndex = height / 2;

for (int r = 0; r < midIndex; r++)

{

int lastIndex = m.length - 1;

int temp = m[r][c];

m[r][c] = m[lastIndex - r][c];

m[lastIndex - r][c] = temp;

}

}

for (int[] row : m) System.out.println(Arrays.toString(row));

1. **After the following code runs, what is the value of** mat[4][3]**?**

int[][] mat = new int[6][6]; //length is arbitrary

for (int r = 0; r < mat.length; r++)

{

for (int c = 0; c <= r; c++)

{

if (c == 0 || r == 0)

mat[r][c] = 1;

else

mat[r][c] = mat[r - 1][c] + mat[r - 1][c - 1];

}

}

**Solutions below.**

1. **8**
2. [0.0, 0.0, 0.0, 0.0]

[1.0, 1.0, 1.0, 1.0]

[2.0, 2.0, 2.0, 2.0]

[3.0, 3.0, 3.0, 3.0]

1. **64**
2. This method shifts values in each row left one position, from column c up to (but excluding) the last element in the row
3. This method adds one to all values in each row, starting at column c
4. A reference to a Something object
5. **8**
6. [4, 4, 4]

[3, 3, 3]

[2, 2, 2]

[1, 1, 1]

1. **4** – these loops are storing the values of Pascal's triangle in the mat array