Java Solutions for Multidimensional Array Questions

## 1. Create and Print a 2D Array

int[][] arr = {  
 {1, 2, 3},  
 {4, 5, 6},  
 {7, 8, 9}  
};  
for (int i = 0; i < arr.length; i++) {  
 for (int j = 0; j < arr[i].length; j++) {  
 System.out.print(arr[i][j] + " ");  
 }  
 System.out.println();  
}

## 2. Sum of All Elements in a 2D Array

int sum = 0;  
for (int i = 0; i < arr.length; i++) {  
 for (int j = 0; j < arr[i].length; j++) {  
 sum += arr[i][j];  
 }  
}  
System.out.println("Sum = " + sum);

## 3. Print Diagonal Elements

for (int i = 0; i < arr.length; i++) {  
 System.out.print(arr[i][i] + " ");  
}

## 4. Transpose of Matrix

int[][] transposed = new int[3][3];  
for (int i = 0; i < arr.length; i++) {  
 for (int j = 0; j < arr[i].length; j++) {  
 transposed[j][i] = arr[i][j];  
 }  
}

## 5. Jagged Array Creation and Print

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

## 6. Search an Element in a 2D Array

int key = 5;  
boolean found = false;  
for (int i = 0; i < arr.length; i++) {  
 for (int j = 0; j < arr[i].length; j++) {  
 if (arr[i][j] == key) {  
 System.out.println("Found at (" + i + ", " + j + ")");  
 found = true;  
 }  
 }  
}  
if (!found) System.out.println("Not Found");

## 7. Add Two Matrices

int[][] a = {{1, 2}, {3, 4}};  
int[][] b = {{5, 6}, {7, 8}};  
int[][] sum = new int[2][2];  
  
for (int i = 0; i < 2; i++) {  
 for (int j = 0; j < 2; j++) {  
 sum[i][j] = a[i][j] + b[i][j];  
 System.out.print(sum[i][j] + " ");  
 }  
 System.out.println();  
}

## 8. Matrix Multiplication

int[][] a = {{1, 2}, {3, 4}};  
int[][] b = {{5, 6}, {7, 8}};  
int[][] result = new int[2][2];  
  
for (int i = 0; i < 2; i++) {  
 for (int j = 0; j < 2; j++) {  
 for (int k = 0; k < 2; k++) {  
 result[i][j] += a[i][k] \* b[k][j];  
 }  
 System.out.print(result[i][j] + " ");  
 }  
 System.out.println();  
}

## 9. Print Spiral Order of Matrix

int[][] mat = {  
 {1, 2, 3},  
 {4, 5, 6},  
 {7, 8, 9}  
};  
int top = 0, bottom = 2, left = 0, right = 2;  
  
while (top <= bottom && left <= right) {  
 for (int i = left; i <= right; i++) System.out.print(mat[top][i] + " ");  
 top++;  
 for (int i = top; i <= bottom; i++) System.out.print(mat[i][right] + " ");  
 right--;  
 for (int i = right; i >= left; i--) System.out.print(mat[bottom][i] + " ");  
 bottom--;  
 for (int i = bottom; i >= top; i--) System.out.print(mat[i][left] + " ");  
 left++;  
}

## 10. 3D Array Creation and Printing

int[][][] arr3d = {  
 {  
 {1, 2},  
 {3, 4}  
 },  
 {  
 {5, 6},  
 {7, 8}  
 }  
};  
  
for (int i = 0; i < arr3d.length; i++) {  
 System.out.println("Layer " + i);  
 for (int j = 0; j < arr3d[i].length; j++) {  
 for (int k = 0; k < arr3d[i][j].length; k++) {  
 System.out.print(arr3d[i][j][k] + " ");  
 }  
 System.out.println();  
 }  
 System.out.println();  
}