Practice Problems: Multi-dimensional Arrays

1. Tracing Programs

For each program below, show what is displayed on the screen when the code executes.

```java
import java.util.Arrays;
public class Array2D
{
  public static void main(String [] args)
  {
    String [][] table = new String[2][3];
    table[0][0] = "team1";
    table[0][1] = "team2";
    table[0][2] = "result";

    table[1][0] = "Temple";
    table[1][1] = "USF";
    table[1][2] = "ugh";

    for(int i=0; i<table.length; i++)
    {
      System.out.println(Arrays.toString(table[i]));
    }

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

import java.util.Arrays;
public class Array2D2 {
  public static void main(String [] args) {
    double [][] values = { {3, 5.5, -7.2}, // row 1
                           {2, -2.5},       // row 2 (only 2 elements)
                           {1.5} };         // row 3 (only 1 element)

    for(int j = 1; j < values.length; j++) {
      for(int k = 0; k < values[j].length; k++) {
        values[j][k] = values[j-1][k];
      }
    }
    for(int j = 0; j < values.length; j++) {
      for(int k = 0; k < values[j].length; k++) {
        System.out.print(values[j][k] + " ");
      }
      System.out.println();
    }
  }
}
```

2. Writing Short Methods

a. Write a method that computes the sum of the numbers in an array and returns the sum.

b. Write a method that computes the sum of the numbers in a 2D array and returns the sum.

c. *Write a method that takes three 2D double arrays as arguments. The method should compute the matrix product of the first two arguments, and store it in the 3rd.

d. Write a method that takes an array of Strings as an argument. It should create a new array of the same length, and copy the elements from the first array to the new one in reverse order.