

2D Array Lab

1) What does the following code print?

```
int[][] arr = new int[2][3];

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

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

2) The following code has an error and will not print as intended.

```
int[][] arr2 = new int[3][];
arr2[0] = new int[]{1, 2};
arr2[1] = new int[]{3, 4, 5};
arr2[2] = new int[]{6};

for (int i = 0; i < arr2.length; i++) {
    for (int j = 0; j < arr2[0].length; j++) {
        print(arr2[i][j] + " ");
    }
}
```

- a) What does it print?
- b) What is the error and why?
- c) How do you fix the code so that the entire `arr2` gets printed out as intended?

For the following coding questions, you can assume that the parameter 2D arrays are NOT ragged, i.e. they are rectangular arrays.

3) Write a function `int sum(int[][] arr)` that takes a 2D integer array `arr` and returns the sum of all integers in the array.

4) Write a function `void zeroOut(int[][] arr, int r, int c)` that takes a 2D integer array `arr` and sets its row `r` and column `c` to 0.

- 5) Write a function `int mostFrequent(int[][] arr)` that takes a 2D integer array `arr` and returns the most frequently appearing number in the array. If there are multiple, you can return any one.
- 6) Write a function `Boolean isLatinSquare(int[][] arr)` that takes a 2D square integer array `arr` and returns `true` if `arr` is a Latin square and `false` otherwise. A Latin square means that each number appears exactly once in each row and column. This one is trickier than it looks. A number of test cases have been provided for you in the lab handout code.