Name (print): ________________________________

1. Consider the code below:

   ```java
   int[][] A = {{1, 2, 3, 4},
                {5, 6, 7, 8},
                {9, 0, 1, 2},
                {3, 4, 5, 6}};
   int[] arr = new int[A.length];
   for (int i = 0; i < A.length; i++) {
       for (int j = 0; j < A[i].length; j++) {
           if (i == j) {
               arr[i] = A[i][j];
           }
       }
   }
   }

   (a) (4 points) Draw the array `arr` after the above code executes.

   Solution: [1, 6, 1, 6]

   (b) (2 points) In your own words, explain what data/values are in `arr` after the code executes.

   Solution: The new array is the diagonal of the original 2D array.

   (c) (4 points) Assume the if statement (and ONLY the if statement) in the above code is changed to:

   ```java
   if(i != j) {
       arr[i] += A[i][j];
   }
   }

   Draw the array `arr` with the above code substitution.

   Solution: This code sums up the rows (similar to what we did in class), but excludes elements where i == j. That is, the code doesn’t add in the diagonal of the array, leading to the array: [9, 20, 11, 12].
2. Consider the code below:

```java
Scanner in = new Scanner(System.in);
System.out.print("Enter an integer: ");
int x = in.nextInt();

switch(x) {
    case 1:
        System.out.println("1");
        break;
    case 2:
        System.out.println("2");
        break;
    case 3:
        System.out.println("3");
        break;
    case 4:
        System.out.println("4");
    case 5:
        System.out.println("5");
    case 6:
        System.out.println("6");
        break;
    case default:
        System.out.println("Error");
        break;
}
```

(a) (2 points) What is the output of the code if the user types the integer 2 at the prompt?

**Solution:** Code will only print “2”

(b) (2 points) What is the output of the code if the user types the integer 4 at the prompt?

**Solution:** The code is missing break statements, so will print “4”, “5”, and “6” before encountering a break statement which ends the switch stmt.

(c) (1 point) What is the output of the code if the user types the integer -6 at the prompt?

**Solution:** Default case executes, so code prints “Error”