## CS212: Programming in Java <br> Practice Midterm1

Question 1: Consider the following Java Program.

```
public class Question1 {
    static String s1, s2,s3, s4;
    public static void main(String[] args){
    s1 = new String("Rose");
    s2 = new String("Jasmine");
    s3 = new String("Tulip");
    s4 = new String("Lilac");
    flowers(s1, s3);
    shuffle(s2, s4);
    }
    private static void flowers(String a1, String a2){
            System.out.println(a1.equals(a2)); //---------(a)
        if(a1.compareTo(a2) < 0)
            System.out.println(a2); //----------------(b)
        else
            System.out.println(a1);
    }
    private static void shuffle(String str1, String str2){
        String b1 = str1;
        str2 = str1;
        str1 = new String("Dahlia");
        System.out.println(b1 == str2); //-------------(c)
        System.out.println(str2); //----------------(d)
        System.out.println(b1); //----------------(e)
    }
}
What is the output at line (a)?
What is the output at line (b)?
What is the output at line (c)?
What is the output at line (d)?
What is the output at line (e)?
```

Question 2: Complete each part before moving on to the next one.

## Part a:

Write a class Fraction with the following specifications:
Two instance variables: numerator and denominator that can be stored as integers.
A no argument constructor.

## Part b:

Add a two argument constructor that will accept two positive integers for numerator and denominator and will initialize the instance variables. The numerator and denominator may be any two integer values.
Write accessor methods for instance variables
Write mutator or set methods for instance variables.

## Part c:

Write a method "add" that accepts another fraction object and adds the fraction of the other object to current fraction ( $\left.a^{*} d+c^{*} b, b^{*} d\right)$, a is the numerator of fraction $1, \mathrm{~b}$ is the denominator of fraction 1 , c is the numerator of fraction 2 , and d is the denominator of fraction 2.
part d:
Write a toString method which is a String representation of the class.
part e: Write an equals method that checks if this fraction is equal to the other fraction

## Question 3 Write blocks of code to perform the functions used in the following

 main program. Your blocks must match the given title lines. Each block should be a short function of only a few lines.public class P3 \{
public static void main(String args[]) \{
String s = "Hello";
int a[][]$=\{\{1,2,3,4\},\{0,1,2,3\}\}$;
int b[]$=\{3,1,4,1\}$;
int $\mathrm{x}=1, \mathrm{y}=2$;
// (a) Return true if at least one of x and y is positive. Here yes is printed.
if (positive(x, y)) System.out.println( "Yes" );
// (b) Return the sum of the first row. Here 10 is printed.
System.out.println(rowSum(a));
// (c) Return the smallest element. Here 1 is printed.

System.out.println(smallest(b));
// (d) Remove the first letter. Here ello is printed.
System.out.println(removeFirst(s));
// (e) Insert an X at the specified position. Here heXllo is printed.
$\mathrm{s}=\operatorname{addX}(\mathrm{s}, 2)$;
System.out.println(s);
\}
\}
(a) private static boolean positive(int $x$, int $y)\{$
(b) private static int rowSum(int[][] a) \{
(c) private static int smallest(int[] b) \{
(d) private static String removeFirst(String s) \{
(e) private static String addX(String s, int i) \{

## Question 4:

Suppose there are n people attending a party. If each person shakes hands with everyone else, how many handshakes occur in the party? Write a complete Java application to find the total number of handshakes. Your program can have either a single main method or a main method and a small private method.

## Question 5:

Please give answers to the following questions in at most three sentences.

1. If $s 1$ and $s 2$ are two variables of String type that have been given String values, what does the method call
s1.compareTo(s2);
compare. At more three sentences please!
$\qquad$
$\qquad$
$\qquad$
2. What is the difference between the private and public modifier before an instance variable?
$\qquad$
$\qquad$
$\qquad$
3. How are primitive variables compared in the equals method?
$\qquad$
$\qquad$
$\qquad$
4. How does the name of a formal parameter affect an identifier with the same name in some other method?
5. What is the difference between a syntax error and a logic error in a program? How does each manifest when one runs the program?
