# Group HW4 (25 pts)

### Everyone will submit one copy of this HW

## (16 pts) Multiple Choices Questions: 2 pts each.

These questions are multiple-choice questions that ask you to select one or more answer choices from a list of choices. A question may not specify the number of choices to select.

1. Note that the Unicode for character A is 65. The expression 'A' + 1 evaluates to _____.
    a. 66
    b. B
    c. A1
    d. Illegal expression

2. Note that the Unicode for character A is 65. The expression "A" + 1 evaluates to _____.
    a. 66
    b. B
    c. A1
    d. Illegal expression

3. Which of the following is the correct statement to return JAVA?
    a. toUpperCase("Java")
    b. "Java".toUpperCase("Java")
    c. "Java".toUpperCase()
    d. String.toUpperCase("Java")

4. Suppose s1 and s2 are two strings. Which of the following statements or expressions are incorrect?
    a. String s3 = s1 - s2;
    b. String s = s1 + s2;
    c. char c = s1[0];
    d. char c = s1.charAt(s1.length());

5. To check if a string s contains the prefix "Java", you may write

    a. if (s.startsWith("Java")) ...
    b. if (s.indexOf("Java") == 0) ...
    c. if (s.substring(0, 4).equals("Java")) ...
    d. if (s.charAt(0) == 'J' && s.charAt(1) == 'a' && s.charAt(2) == 'v' && s.charAt(3) == 'a') ...

6. Which of the following are valid specifiers for the printf statement?

    a. %4c
    b. %10b
    c. %6d
    d. %8.2d

7. The statement System.out.printf("%3.1f", 1234.56) outputs _____ .

    a. 123.4
    b. 123.5
    c. 1234.6
    d. 1234.56

8. The statement System.out.printf("%10s", 123456) outputs___. (Note: * represents a space)

    a. 123456****
    b. 23456*****
    c. 12345*****
    d. ****123456

## (9 pts) Coding Exercise Question: The Triangle Class

Problem Description:

Design a class named Triangle that extends GeometricObject. The class contains:

- Three double data fields named side1, side2, and side3 with default values 1.0 to denote three sides of the triangle.
- A no-arg constructor that creates a default triangle.
- A constructor that creates a triangle with the specified side1, side2, and side3.
- The accessor methods for all three data fields.
- A method named getArea() that returns the area of this triangle.
- A method named getPerimeter() that returns the perimeter of this triangle.
- A method named toString() that returns a string description for the triangle.

Implement it to return the three sides. The toString() method is implemented as follows:

```
return "Triangle: side1 = " + side1 + " side2 = " + side2 +
  " side3 = " + side3;
```

Draw the UML diagram that involves the classes Triangle and GeometricObject. Implement the class. Write a test program that creates a Triangle object with sides 1, 1.5, 1, color yellow and filled true, and displays the area, perimeter, color, and whether filled or not.

Design: (Draw the UML class diagram here)

Coding: (Copy and Paste Source Code here. Template is provided.)

```
public class ExerciseTriangle {
  public static void main(String[] args) {
    Triangle triangle = new Triangle(1, 1.5, 1);
    triangle.setColor("yellow");
    triangle.setFilled(true);

    System.out.println(triangle);
    System.out.println("The area is " + triangle.getArea());
    System.out.println("The perimeter is "
      + triangle.getPerimeter());
    System.out.println(triangle);
  }
}

class GeometricObject {
  // Copy code from the link below:
  // https://liveexample.pearsoncmg.com/html/SimpleGeometricObject.html
}

class Triangle extends GeometricObject {
  // Implement it
}
```

Testing: (Paste the screenshot of your result here.)