CS163/164 Class and Objects Practice

1. Analyze the class definition provided below to answer the following questions:
   a. What is the name of this class?
   b. How many properties/data it stores? What are their names and types?
   c. How many methods does it have?
   d. For each method identify the type of access, return, and parameters.
   e. What the method setBase does?
   f. What is the meaning of this.base = base? Why we need to use this keyword?

```java
public class Triangle {
    int base = 0;
    int height = 0;

    public void setBase(int base){
        this.base = base;
    }

    public void setHeight(int h) {
        height = h;
    }

    public double calculateArea() {
        return (base * height)/2;
    }

    public String toString(){
        return "Base:" + base + " Height:" + height;
}
```

2. Analyze the class definition provided below to answer the following questions:
   a. What is the name of the class?
   b. What the main method does?
   c. Explain what each one of instructions inside the main method does.
   d. Why do we need parameters to call setBase and setHeight and we don't need to call toString and calculateArea?
   e. Create a new object, set new values to base and height, print the properties of the object as well as its area.

```java
public class Application {

    public static void main(String args[]){
        Triangle tr1 = new Triangle();
        tr1.setBase(10);
        tr1.setHeight(5);
        System.out.println(tr1.toString());
        System.out.println("Area:" + tr1.calculateArea());
    }
}
```

3. Given the following Code, what is printed?
   a. Remember from your readings that a char is internally stored as an int value.
   b. The ASCII Table https://en.wikipedia.org/wiki/File:ASCII-Table.svg provides a table where you can see the int value related to a char value.
   c. So, what do you think is going to happen if you add a char with an int.

```java
public class CharString {
    public static char characterAddition(char a, int b) {
        return (char) (a + b);
    }

    public static void main(String[] args) {
        System.out.println(characterAddition('A', 2));

    }
}
```

4. Analyze the code below to explain what happen when we try to run that program? Is there a problem? If yes, how to solve it?

```java
public class CastingProgram {
    public static void main(String[] args) {
        int value1 = 12;
        double value2 = 25.75;
        double resultDouble = value1 + value2;
        System.out.print(value1 + " + " + value2 + " = ");
        System.out.println(resultDouble);
        int resultInt = value1 + (int) value2;
        System.out.print(value1 + " + " + value2 + " = ");
        System.out.println(resultInt);
    }
}
```

5. What is a String in Java? Do a search over the Internet and provide some examples of use?