

COMP 248 - Tutorial #9

Introduction to Classes

Question 1: Assume the following class that represents a playing card.

```
public class PlayingCard
{
    private int value; // ex. 1 (ace) to 13 (king)
    private String color; // ex: "heart" "diamond" "club" "spade"

    private void writeOutput()
    {
        System.out.println(value + " of " + color);
    }
    public void randomCard()
    {
        value = (int)(Math.random()*13)+1; // a random integer between [1..13]
        switch ((int)(Math.random()*4)+1) // a random integer between [1..4]
        {
            case 1: color = "heart"; break;
            case 2: color = "diamond"; break;
            case 3: color = "spade"; break;
            case 4: color = "club"; break;
        }
    }
    public int isAFace()
    {
        // is the value a jack (11), a queen (12) or a king (13)?
        return (value == 11 || 12 || 13);
    }
    public boolean isAnAce()
    {
        return (PlayingCard.value == 1);
    }
}
```

And assume the following driver:

```
public class CardDriver
{
    public static void main(String[] args)
    {
        PlayingCard mySecondCard = new PlayingCard();
        mySecondCard.randomCard();
        boolean answer = isAnAce();
        do
        {
            mySecondCard = randomCard();
            System.out.println(mySecondCard.isAFace());
            System.out.println(mySecondCard.writeOutput());
        }
        while (mySecondCard.isAFace());
    }
}
```

A- Name all the objects of the class `PlayingCard`.

B- Name all the methods of the class `PlayingCard`.

C- The class and the driver program contain several syntax errors. Identify and correct them.

Question 2: Given the following class definition:

```
public class Question {
    private int gradeQ1;
    private int gradeQ2;
    private int gradeQ3;
    private int total;

    public void computeTotal() {
        ...
    }

    public int returnTotal() {
        ...
    }

    public void printTotal() {
        ...
    }

    public boolean getQuestionRight() {
        ...
    }
}
```

1. How many states does an object of type class have and what are their names?
2. Write down the complete header of one of the methods of class `Question`?
3. What is the return type of the method `computeTotal()`?
4. What is the return type of the method `getQuestionRight()`?
6. Complete the method `computeTotal()` so that calculates the total score (sum of `gradeQ1`, `gradeQ2` and `gradeQ3`).
7. Complete the method `returnTotal()` which returns the total score.
8. Complete the method `printTotal()` which displays the total score.

Question 3: Consider the following class:

```
public class AClass
{
    private int a;
    public int b;

    public AClass()
    {
        a = 10;
        b = 10;
    }

    private void increment()
    {
        increment(1);
    }

    public void increment(int i)
    {
        a+= i;
        b+= i;
    }
}
```

and the following declaration in the driver class:

```
AClass obj1 = new AClass();
```

Indicate if the following instructions will cause a syntax error if they are placed in the driver class after the above declaration. If there is an error, briefly explain why.

```
System.out.print(obj1);
AClass.increment(5+5);
System.out.print(obj1.a);
System.out.print(obj1.b);
```