Practice Problems: Classes and Objects (Chapters 5 and 6)

1) The Java class called Holiday is started below. An object of class Holiday represents a holiday during the year. This class has three instance variables:
   • name, which is a String representing the name of the holiday
   • day, which is an int representing the day of the month of the holiday
   • month, which is a String representing the month the holiday is in

   public class Holiday {
       private String name;
       private int day;
       private String month;

       // your code goes here
   }

   a) Write a constructor for the class Holiday, which takes a String representing the name, an int representing the day, and a String representing the month as its arguments, and sets the class variables to these values.

   An answer:

   public Holiday(String n, int d, String m) {
       name = n;
       day = d;
       month = m;
   }

   b) Write a method inSameMonth, which compares two instances of the class Holiday, and returns the Boolean value true if they have the same month, and false if they do not.

   An answer:

   public boolean inSameMonth(Holiday hol){
       return this.month.equals(hol.month);
   }

   c) Write a method avgDate which takes an array of base type Holiday as its argument, and returns a double that is the average of the day variables in the Holiday instances in the array. You may assume that the array is full (i.e. does not have any null entries).
An answer:

    public static double avgDate(Holiday[] hol) {
        int sum = 0;
        for(int i = 0; i < hol.length; i++) {
            sum = sum + hol[i].day;
        }
        return ((double) sum)/hol.length;
    }

d) Write a piece of code that creates a Holiday instance with the name “Independence Day”, with the day “4”, and with the month “July”.

An answer:

    Holiday hol = new Holiday("Independence Day", 4, "July");

2) The class Movie is started below. An instance of class Movie represents a film. This class has the following three class variables:
   • title, which is a String representing the title of the movie
   • studio, which is a String representing the studio that made the movie
   • rating, which is a String representing the rating of the movie (i.e. PG-13, R, etc)

    public class Movie {
        private String title;
        private String studio;
        private String rating;

        // your code goes here
    }

a) Write a constructor for the class Movie, which takes a String representing the title of the movie, a String representing the studio, and a String representing the rating as its arguments, and sets the respective class variables to these values.

An answer:

    public Movie(String t, String s, String r) {
        title = t;
b) Write a second constructor for the class Movie, which takes a String representing the title of the movie and a String representing the studio as its arguments, and sets the respective class variables to these values, while the class variable rating is set to "PG".

An answer:

```java
public Movie (String t, String s) {
    title = t;
    studio = s;
    rating = "PG";
}
```

c) Write a method getPG, which takes an array of base type Movie as its argument, and returns a new array of only those movies in the input array with a rating of "PG". You may assume the input array is full of Movie instances. The returned array need not be full.

An answer:

```java
public static Movie[] getPG(Movie[] mov) {
    Movie[] pgMov = new Movie[mov.length];
    int newArrayIndex = 0;
    for (int i = 0; i < mov.length; i++) {
        if (mov[i].rating.equals("PG")) {
            pgMov[newArrayIndex] = mov[i];
            newArrayIndex++;
        }
    }
    return pgMov;
}
```

d) Write a piece of code that creates an instance of the class Movie with the title “Casino Royale”, the studio “Eon Productions”, and the rating “PG-13”.

An answer:

```java
Movie mov = new Movie("Casino Royale","Eon Productions","PG-13");
```