CS1040 - Program Construction

Formative assessment - 1

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Question 1

Swimming competition

Objects:

Swimming pool, Swimmers, Spectators, Judges, Supporting staff, Touch pad, Scoreboard.

States:

Objects	States
Swimming pool	5 lanes, pavilion
Swimmers	Male, Female, name
Swimming clothes	Blue, Red
Scoreboard	Finishing time

Behaviors:

- Judge – Blow the whistle
- Swimmers – Start swim, Reach end of the pool, Touch a touch pad
- Touch pad - Notify the finishing time to a score board
- Score board - Compare the finishing times, Identify the order of finishing, Display the results

Question 2

Objects and attributes

Objects	Attributes
Articles	Headline, Byline, Tagline, Images
Headline	font type, font size, font color, background color, bold type face
Byline	font type, font size, font color
Tagline	font type, font size, font color
Date-stamp	font type, font size, font color
Line of text	font type, font size, font color, background color, bold type face, italic type face, underlined type face

Objects that can form the basis of an "abstract" object

- Text

This can represent the common attributes that apply to all lines of text in the newspaper, such as font type, font size, font color, background color, bold type face, italic type face, and underlined type face.

- Article Info

This can represent the common attributes that apply to all news articles, such as headline, byline, tagline, and date-stamp.

- Article Content

This can represent the content of a news article, which includes one or more paragraphs of text and one or more images.

Characteristics of objects that would represent their internal state

- Headline: A string containing the headline of the news article.
- Byline: A string containing the author of the news article.
- Tagline: A string containing a short description of the news article.
- Date-stamp: A string containing the date when the news article was published.
- Content: A list of paragraphs, where each paragraph is represented as a string.

- Images: A list of images, where each image is represented as an object with attributes such as file path, caption, and size.
- Font type: A string representing the font type used for the text.
- Font size: A number representing the font size used for the text.
- Font color: A string representing the font color used for the text.
- Background color: A string representing the background color used for the text.
- Bold/italic or underlined: boolean indicating whether the text is in bold or not/italic or not/ underlined or not.

Question 3

```
import java.util.Scanner;
public class SwimmingCompetition{

   public static void main(String[] args){
      Scanner input = new Scanner(System.in);
      System.out.println("Enter number of swimmers");
      int number = input.nextInt();
      Swimmer[] swimmers = new Swimmer[number];
      for (int i=0;i<number;i++){
         System.out.println("Enter the name of swimmer " + (i+1) + ": ");
         String Name =  input.nextLine();
         input.nextLine();
         System.out.println("Enter the ID number of swimmer : ");
         long ID =  input.nextLong();
         System.out.println("Enter true if the swimmer is male if not, enter false : ");
         boolean maleOrNot =  input.nextBoolean();
         swimmers[i] = new Swimmer(Name,ID,maleOrNot);
      }

      System.out.println("Enter number of judges");
      number = input.nextInt();
      Judges[] judges = new Judges[number];
      for (int i=0;i<number;i++){
         System.out.println("Enter the name of judge " + (i+1) + ": ");
         String Name =  input.nextLine();
         input.nextLine();
         System.out.println("Enter the ID number of judge : ");
         long ID =  input.nextLong();
         judges[i] = new Judges(Name,ID);
      }

      System.out.println("Enter number of spectators");
      number = input.nextInt();
      Spectators[] spectators = new Spectators[number];
      for (int i=0;i<number;i++){
         System.out.println("Enter the name of spectator " + (i+1) + ": ");
         String Name =  input.nextLine();
         input.nextLine();
         System.out.println("Enter the ID number of spectator : ");
         long ID =  input.nextLong();
         spectators[i] = new Spectators(Name,ID);
      }

      System.out.println("Enter number of supporting staff members");
      number = input.nextInt();
      SupportingStaff[] supportingStaff = new SupportingStaff[number];
      for (int i=0;i<number;i++){
         System.out.println("Enter the name of supporting staff member " + (i+1) + ": ");
         String Name =  input.nextLine();
         input.nextLine();
         System.out.println("Enter the ID number of supporting staff member : ");
         long ID =  input.nextLong();
         supportingStaff[i] = new SupportingStaff(Name,ID);
      }
```

```
        Judges Judge1 = new Judges(judges[0].name,judges[0].IDNumber);
        Judge1.blow();
    }
}

class Swimmer{
    String name;
    long IDNumber;
    boolean isMale;

    public Swimmer(String name, long IDNumber, boolean isMale){
        this.name = name;
        this.IDNumber = IDNumber;
        this.isMale = isMale;
    }

    void swim(){
        System.out.println("The swimmers are swimming right now!");
    }
}

class Judges{
    String name;
    long IDNumber;

    public Judges(String name, long IDNumber){
        this.name = name;
        this.IDNumber = IDNumber;
    }

    void blow(){
        System.out.println("Judge blew the whistle!");
    }

}

class Spectators{
    String name;
    long IDNumber;

    public Spectators(String name, long IDNumber){
        this.name = name;
        this.IDNumber = IDNumber;
    }
}

class SupportingStaff{
    String name;
    long IDNumber;

    public SupportingStaff(String name, long IDNumber){
        this.name = name;
        this.IDNumber = IDNumber;
    }
}
```