



Formative Assessment

# CS1040 – Program Construction

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## Question 1

Identify objects, their states, and behavior in this scenario.

Objects	States	behavior
Swimming Pool	Pavilion, lanes, competition	Notify the finishing time, Display on a score Board
Swimmer	Male, Female, Name, Clothes' color, Finishing time, Position	Start, Swimming, Finishing, Touch touch-pad
Spectators	Name	
Judge	Name	Blows the whistle
Supporting staff	Name	
Touch Pad	Finishing Time, Order	Notify finishing time, Compare the finishing times, and identify the order of finishing,

Advanced task – identify relationships among these objects.

- When the **judge** *blows the whistle*, the **competition** is *started* and the **players** *start swimming*.
- **Players** need to *touch* a **touch pad** at this finishing end. Each **touch pad** then *notifies the finishing time* to a **score board**.

## Question 2

Objects	Attributes
Articles	Headlines, Images, Paragraphs, Byline, Tagline, Date-stamp, Paragraph
Text	Font type, font size, font color, background color, bold type face, italic type face, underlined type face
Headline	Inherits from Text
Byline	Inherits from Text
Tagline	Inherits from Text
Date-stamp	Inherits from Text
Paragraph	Inherits from Text

### Question 3

#### Main Class

```
public class Main {
    public static void main(String[] args) {
        Swimmer swimmer1 = new Swimmer("Micheal Phelps", "210730B", "Male");
        Swimmer swimmer2 = new Swimmer("Mark Spitz", "210745B", "Male");
        Judge judge = new Judge("Kumara Dharmasena", "210780V");
        supportStaff supportStaff1 = new supportStaff("Niminda", "210790H");
        Spectator spec1 = new Spectator("Percy", "210795S");
        judge.blowWhistle();
        swimmer1.Swim();
        swimmer2.Swim();
        supportStaff1.checkScoreBoard();
        swimmer1.touchPad();
        spec1.checkScoreBoard();
        swimmer2.touchPad();
        swimmer2.setCurrent_position(2);
        swimmer1.checkScoreBoard();
        judge.checkScoreBoard();
    }
}
```

#### Swimmer Class

```
public class Swimmer {
    private String Name;
    private String id;
    private int current_position = 1;
    private String gender;
    private boolean swim = false;

    public Swimmer(String Name, String id, String gender) {
        this.Name = Name;
        this.id = id;
        this.gender = gender;
    }

    public void setCurrent_position(int current_position) {
        this.current_position = current_position;
    }

    public void Swim() {
        this.swim = true;
    }
}
```

```
public void touchPad() {
    this.swim = false;
}

public void checkScoreBoard() {
    System.out.println(this.Name + "\t" + this.id + "\t" + this.current_position);
}
}
```

### **Judge Class**

```
public class Judge {
    private String Name;
    private String id;

    public Judge(String Name, String id) {
        this.Name = Name;
        this.id = id;
    }

    public void checkScoreBoard() {
        System.out.println(this.Name + " has checked the scoreboard");
    }

    public void blowWhistle() {
        System.out.println("The swimming competition has started");
    }
}
```

### **Support Staff Class**

```
public class supportStaff {
    private String Name;
    private String id;

    public supportStaff(String Name, String id) {
        this.Name = Name;
        this.id = id;
    }

    public void checkScoreBoard() {
        System.out.println(this.Name + " has checked the scoreboard");
    }
}
```

## **Spectator Class**

```
public class Spectator {  
    private String Name;  
    private String id;  
  
    public Spectator(String Name, String id) {  
        this.Name = Name;  
        this.id = id;  
    }  
  
    public void checkScoreBoard() {  
        System.out.println(this.Name + " has checked the scoreboard");  
    }  
}
```