

**Version 1**

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**Version 2**

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## Version 1

a.

```
public Song(String title, String artist, int length, String composer) {  
    this.title = title;  
    this.artist = artist;  
    this.length = length;  
    this.composer = composer;  
}
```

b.

```
public boolean equals(Object obj) {  
    boolean answer = false;  
  
    if (obj instanceof Song) {  
        Song otherSong = (Song) obj;  
        if (this.title.equals(otherSong.getTitle())) {  
            if (this.artist.equals(otherSong.getArtist())) {  
                if (this.length == otherSong.getLength()) {  
                    if (this.composer.equals(otherSong.getComposer())) {  
                        answer = true;  
                    }  
                }  
            }  
        }  
    }  
}  
  
return answer;  
}
```

c.

```
public String toString() {  
    return "Song = [ title = " + this.title +  
        " artist = " + this.artist +  
        " length = " + this.length +  
        " composrt = " + this.composer +  
        " ]";  
}
```

## Version 2

a.

```
public Course(String title, String instructor, int credits, String department) {  
    this.title = title;  
    this.instructor = instructor;  
    this.credits = credits;  
    this.department = department;  
}
```

b.

```
public boolean equals(Object obj) {  
    boolean answer = false;  
  
    if (obj instanceof Course) {  
        Course otherCourse = (Course) obj;  
        if (this.title.equals(otherCourse.getTitle())) {  
            if (this.instructor.equals(otherCourse.getInstructor())) {  
                if (this.credits == otherCourse.getCredits()) {  
                    if (this.department.equals(otherCourse.getDepartment())) {  
                        answer = true;  
                    }  
                }  
            }  
        }  
    }  
  
    return answer;  
}
```

c.

```
public String toString() {  
    return "Course = [ title = " + this.title +  
        " instructor = " + this.instructor +  
        " credits = " + this.credits +  
        " department = " + this.department +  
        " ]";  
}
```

**Version 1**

```
public static void swap(int index1, int index2, int[] array) {  
    int temp = array[index1];  
    array[index1] = array[index2];  
    array[index2] = temp;  
}
```

**Version 2**

```
public static void swap(int index1, int index2, double[] array) {  
    double temp = array[index1];  
    array[index1] = array[index2];  
    array[index2] = temp;  
}
```

## Version 1

```
public class SumDif extends JFrame {
    Result result;    Content content;
    public SumDif() {
        setLayout(new BorderLayout());
        result = new Result();
        add(result, BorderLayout.NORTH);
        content = new Content();
        add(content, BorderLayout.CENTER);
        setSize(200, 200);
        setVisible(true);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
    }

    private class Result extends JPanel {
        JLabel result = new JLabel("Result Goes Here");
        public Result() {
            setLayout(new GridLayout(1, 1));
            add(result);
        }
        private void setResult(String s) {
            this.result.setText(s);
        }
    }

    private class Content extends JPanel implements ActionListener {
        JTextField tf1 = new JTextField("0");    JTextField tf2 = new JTextField("0");
        JButton btnSum = new JButton("Sum");    JButton btnDiff = new JButton("Diff");
        public Content() {
            setLayout(new GridLayout(2, 2));
            add(tf1);    add(tf2);    add(btnSum);    add(btnDiff);
            btnSum.addActionListener(this);    btnDiff.addActionListener(this);
        }

        public void actionPerformed(ActionEvent e) {
            JButton clickedButton = (JButton) e.getSource();
            int int1 = 0, int2 = 0;
            try {
                int1 = new Integer(tf1.getText()).intValue();
                int2 = new Integer(tf2.getText()).intValue();
            } catch (NumberFormatException nfe) {
                int1 = 0;    int2 = 0;
            }
            if (clickedButton.getText().equals("Sum")) {
                result.setResult("" + (int1 + int2));
            } else if (clickedButton.getText().equals("Diff")) {
                result.setResult("" + (int1 - int2));
            }
        }
    }
}
```

## Version 2

```
public class MulDiv extends JFrame {
    Result result;    Content content;
    public MulDiv() {
        setLayout(new BorderLayout());
        result = new Result();
        add(result, BorderLayout.NORTH);
        content = new Content();
        add(content, BorderLayout.CENTER);
        setSize(200, 200);
        setVisible(true);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
    }

    private class Result extends JPanel {
        JLabel result = new JLabel("Result Goes Here");
        public Result() {
            setLayout(new GridLayout(1, 1));
            add(result);
        }
        private void setResult(String s) {
            this.result.setText(s);
        }
    }

    private class Content extends JPanel implements ActionListener {
        JTextField tf1 = new JTextField("0");    JTextField tf2 = new JTextField("0");
        JButton btnSum = new JButton("Mul");    JButton btnDiff = new JButton("Div");
        public Content() {
            setLayout(new GridLayout(2, 2));
            add(tf1); add(tf2);    add(btnSum);    add(btnDiff);
            btnSum.addActionListener(this);    btnDiff.addActionListener(this);
        }

        public void actionPerformed(ActionEvent e) {
            JButton clickedButton = (JButton) e.getSource();
            int int1 = 0, int2 = 0;
            try {
                int1 = new Integer(tf1.getText()).intValue();
                int2 = new Integer(tf2.getText()).intValue();
            } catch (NumberFormatException nfe) {
                int1 = 0; int2 = 0;
            }
            if (clickedButton.getText().equals("Mul")) {
                result.setResult("" + (int1 * int2));
            } else if (clickedButton.getText().equals("Div")) {
                try {
                    result.setResult("" + (int1 / int2));
                } catch (ArithmeticException ae) {
                    result.setResult("Divide By Zero");
                }
            }
        }
    }
}
```

**Question 5****Version 1**

A1 [name = A1 color = Blue length = 2]  
A1 [name = B1 color = Green length = 6]  
B1 [width = 4 area = 24]  
A1 [name = C1 color = Grey length = 3]  
B1 [width = 2 area = 6]  
C1 [height = 5 volume = 30]  
A1 [name = B1 color = Green length = 6]  
B1 [width = 4 area = 24]  
A1 [name = C1 color = Grey length = 3]  
B1 [width = 2 area = 6]  
C1 [height = 5 volume = 30]

**Version 2**

A2 [name = A2 color = Grey length = 5]  
A2 [name = B2 color = Blue length = 4]  
B2 [width = 4 area = 16]  
A2 [name = C2 color = Red length = 2]  
B2 [width = 4 area = 8]  
C2 [height = 3 volume = 24]  
A2 [name = B2 color = Blue length = 4]  
B2 [width = 4 area = 16]  
A2 [name = C2 color = Red length = 2]  
B2 [width = 4 area = 8]  
C2 [height = 3 volume = 24]