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Ans 13. a.

```java
/** Main.java **/
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
public class Main {
    JLabel l;
    Main() {
        JFrame f = new JFrame("Swing Frame");
        l = new JLabel("", SwingConstants.CENTER);
        l.setBounds(15, 110, 260, 30);
        f.add(l);
        f.addMouseListener(new MouseAdapter() {
            @Override
            public void mouseClicked(MouseEvent e) {
                l.setText("Mouse Clicked");
            }
            @Override
            public void mouseEntered(MouseEvent e) {
                l.setText("Mouse Entered");
            }
            @Override
            public void mouseExited(MouseEvent e) {
                l.setText("Mouse Exited");
            }
        });
        f.setSize(300, 300);
        f.setLayout(null);
```

```
        f.setVisible(true);

        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    }

    public static void main(String[] args) {

        SwingUtilities.invokeLater(new Runnable() {

            public void run() {

                new Main();

            }

        });

    }

}
```
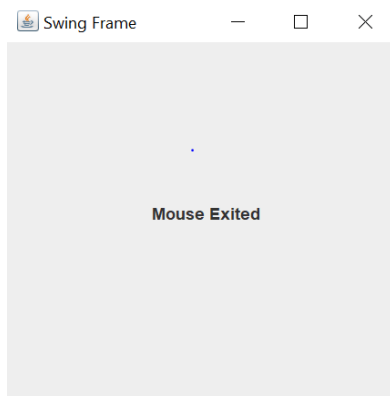

Ans 13. B.

```
/** Main.java **/

import java.awt.*;

import java.awt.event.*;

import javax.swing.*;

public class Main {

    JLabel l;

    Main() {

        JFrame f = new JFrame("Swing Pink");

        l = new JLabel("This is some text", SwingConstants.CENTER);

        l.setBounds(15, 15, 260, 30);

        f.add(l);
```

```java
        f.getContentPane().setBackground(Color.PINK);

        f.setSize(300, 100);

        f.setLayout(null);

        f.setVisible(true);

        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    }

    public static void main(String[] args) {

        SwingUtilities.invokeLater(new Runnable() {

            public void run() {

                new Main();

            }

        });

    }

}
```
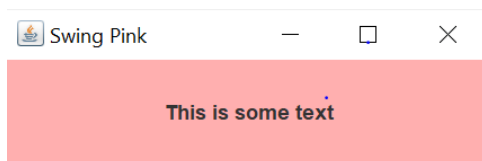

Ans 13. C.

```java
import java.awt.*;

import java.awt.event.*;

import javax.swing.*;

public class Main {

    JButton btnRed, btnBlue;

    Main() {

        JFrame f = new JFrame("Swing Buttons");

        btnRed = new JButton("Red");

        btnRed.setBounds(16, 20, 250, 30);

        btnRed.addActionListener(new ActionListener() {

            @Override
```

```java
            public void actionPerformed(ActionEvent e) {
                f.getContentPane().setBackground(Color.RED);
            }
        });
        f.add(btnRed);
        btnBlue = new JButton("Blue");
        btnBlue.setBounds(16, 65, 250, 30);
        btnBlue.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                f.getContentPane().setBackground(Color.BLUE);
            }
        });
        f.add(btnBlue);
        f.setSize(300, 160);
        f.setLayout(null);
        f.setVisible(true);
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            public void run() {
                new Main();
            }
        });
    }
}
```
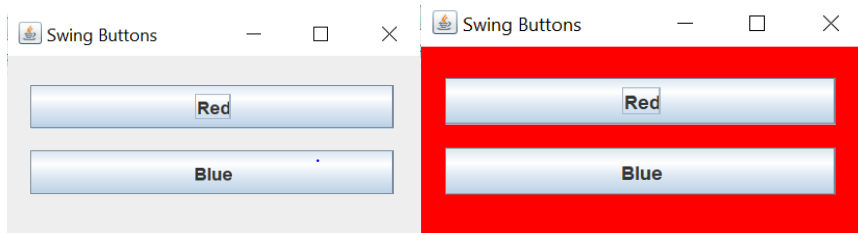
Ans 13. D.

```java
import java.awt.*;

import java.awt.event.*;

import javax.swing.*;

class KbdAdapter extends KeyAdapter {

    JLabel l;

    KbdAdapter(JLabel l) {

        this.l = l;

    }

    @Override

    public void keyTyped(KeyEvent e) {

        l.setText("Typed character is: " + e.getKeyChar());

    }

    @Override

    public void keyPressed(KeyEvent e) {

        System.out.println("Pressed character is: " + e.getKeyChar());

    }

    @Override

    public void keyReleased(KeyEvent e) {

        System.out.println("Released character is: " + e.getKeyChar());

    }

}

public class Main {

    JLabel l;

    Main() {
```
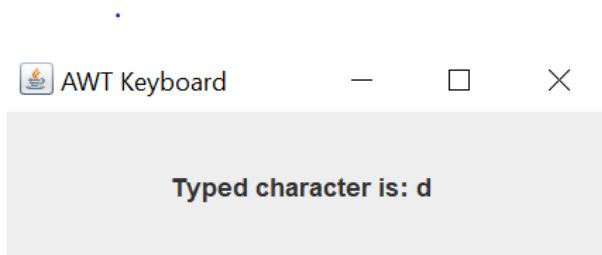
```java
        JFrame f = new JFrame("AWT Keyboard");

        l = new JLabel("", SwingConstants.CENTER);

        l.setBounds(15, 20, 250, 30);

        f.addKeyListener(new KbdAdapter(l));

        f.add(l);

        f.setSize(300, 110);

        f.setLayout(null);

        f.setVisible(true);

        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    }

    public static void main(String[] args) {

        SwingUtilities.invokeLater(new Runnable() {

            public void run() {

                new Main();

            }

        });

    }

}
```


Ans 13. E.

```java
/** Main.java **/

import java.awt.*;

import java.awt.event.*;

import javax.swing.*;

public class Main implements ActionListener {
```

```java
JButton btnInfo, btnCGPA;
Main() {
    JFrame f = new JFrame("Student Details");
    btnInfo = new JButton("A");
    btnInfo.setBounds(18, 100, 450, 100);
    btnInfo.addActionListener(this);
    f.add(btnInfo);
    btnCGPA = new JButton("B");
    btnCGPA.setBounds(18, 270, 450, 100);
    btnCGPA.addActionListener(this);
    f.add(btnCGPA);
    f.setSize(500, 500);
    f.setLayout(null);
    f.setVisible(true);
    f.setLocationRelativeTo(null);
    f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public static void main(String[] args) {
    SwingUtilities.invokeLater(new Runnable() {
        public void run() {
            new Main();
        }
    });
}
@Override
public void actionPerformed(ActionEvent e) {
    if (e.getSource() == btnInfo) {
        new Information(
            "Priyanshu Jhansla",
            "BSc (Hons) Computer Science",
            "88008",
```

```java
            "ARSD College"

        );

    } else if (e.getSource() == btnCGPA) {

        new CGPA("9.36");

    }

  }

}


/** Information.java **/
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
class Information {

    JButton btnClose;

    JPanel panelForm;

    JLabel labelName, labelCourse, labelRollNo, labelCollege;

    JTextField fieldName, fieldCourse, fieldRollNo, fieldCollege;

    Information(String name, String course, String rollNo, String college) {

        JFrame f = new JFrame("Personal Information");

        labelName = new JLabel("Name:");

        labelName.setBounds(30, 30, 90, 23);

        labelCourse = new JLabel("Course:");

        labelCourse.setBounds(30, 60, 100, 23);

        labelRollNo = new JLabel("Roll No.:");

        labelRollNo.setBounds(30, 90, 80, 23);

        labelCollege = new JLabel("College:");

        labelCollege.setBounds(30, 120, 90, 23);

        fieldName = new JTextField(name);

        fieldName.setBounds(120, 30, 210, 23);

        fieldName.setEditable(false);

        fieldCourse = new JTextField(course);
```

```java
fieldCourse.setBounds(120, 60, 210, 23);

fieldCourse.setEditable(false);

fieldRollNo = new JTextField(rollNo);

fieldRollNo.setBounds(120, 90, 210, 23);

fieldRollNo.setEditable(false);

fieldCollege = new JTextField(college);

fieldCollege.setBounds(120, 120, 210, 23);

fieldCollege.setEditable(false);

btnClose = new JButton("Close");

btnClose.setBounds(110, 160, 140, 30);

btnClose.addActionListener(new ActionListener() {

    @Override

    public void actionPerformed(ActionEvent e) {

        f.dispose();

    }

});

panelForm = new JPanel();

panelForm.setLayout(null);

panelForm.add(labelName);

panelForm.add(fieldName);

panelForm.add(labelCourse);

panelForm.add(fieldCourse);

panelForm.add(labelRollNo);

panelForm.add(fieldRollNo);

panelForm.add(labelCollege);

panelForm.add(fieldCollege);

panelForm.add(btnClose);

f.add(panelForm);

f.setSize(380, 250);

f.setVisible(true);

f.setLayout(null);
```

```java
        f.setLocationRelativeTo(null);

        f.setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);

    }

}


/** CGPA.java **/
import java.awt.*;

import java.awt.event.*;

import javax.swing.*;

class CGPA {

    JLabel l;

    JButton btnClose;

    CGPA(String cgpa) {

        JFrame f = new JFrame("Previous Year CGPA");

        l = new JLabel("Your CGPA was: " + cgpa, SwingConstants.CENTER);

        l.setBounds(20, 20, 250, 30);

        btnClose = new JButton("Close");

        btnClose.setBounds(90, 60, 100, 30);

        btnClose.addActionListener(new ActionListener() {

            @Override

            public void actionPerformed(ActionEvent e) {

                f.dispose();

            }

        });

        f.add(l);

        f.add(btnClose);

        f.setSize(310, 150);

        f.setLayout(null);

        f.setVisible(true);

        f.setLocationRelativeTo(null);

        f.setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
```

```
        }

}
```