JAVA PROGRAMMING LAB (ETCS – 357)

LAB-11

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EXPERIMENT 11.1

AIM : Create runnable jar file in java

Theory :

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method.

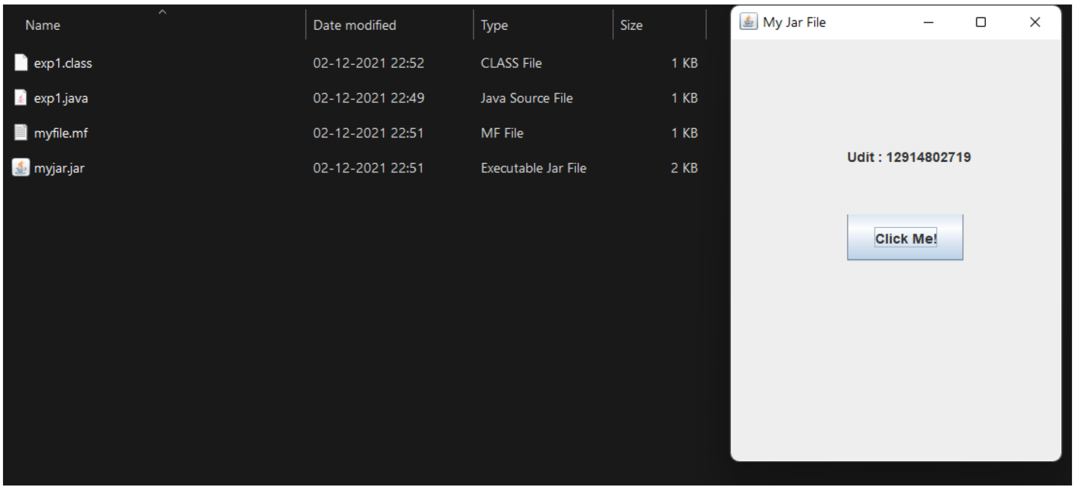
Source Code :

```
import javax.swing.*;
public class exp1{
exp1(){
JFrame f=new JFrame("My Jar File");

JButton b=new JButton("Click Me!");
b.setBounds(100,150,100, 40);
JLabel l1 = new JLabel("Udit : 12914802719");
l1.setBounds(100,50, 170,100);
f.add(b);
f.add(l1);
f.setSize(300,400);
f.setLayout(null);
f.setVisible(true);


f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public static void main(String[] args) {
    new exp1();
}
}
```

Output :



Name	Date modified	Type	Size
exp1.class	02-12-2021 22:52	CLASS File	1 KB
exp1.java	02-12-2021 22:49	Java Source File	1 KB
myfile.mf	02-12-2021 22:51	MF File	1 KB
myjar.jar	02-12-2021 22:51	Executable Jar File	2 KB

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EXPERIMENT 11.2

AIM : Display image on a button in swing

Theory :

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

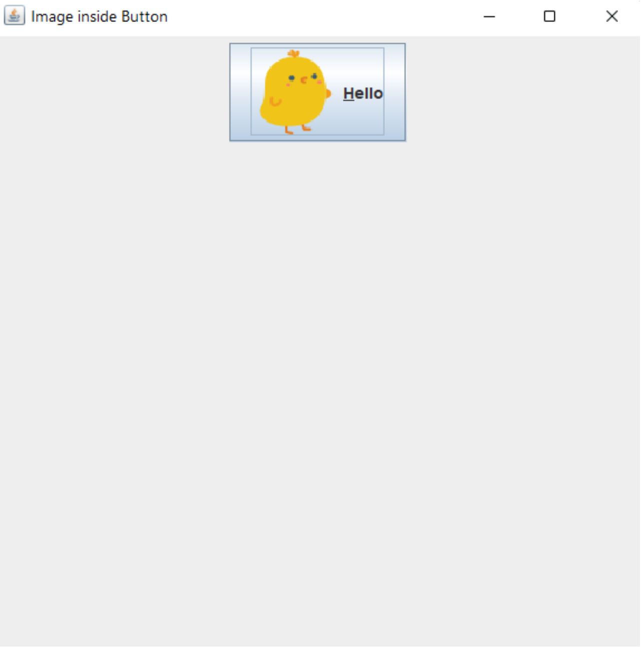
JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

Source Code :

```
import javax.swing.ImageIcon;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.SwingUtilities;
import javax.swing.WindowConstants;
import java.awt.FlowLayout;

public class exp2 extends JFrame {
    public exp2() {
        initComponents();
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(() -> new
exp2().setVisible(true));
    }

    private void initComponents() {
        setTitle("Image inside Button");
        setSize(500, 500);

setDefaultCloseOperation(WindowConstants.EXIT_ON_CLOSE);
        getContentPane().setLayout(new
FlowLayout(FlowLayout.CENTER));

        JButton helloButton = new JButton("Hello", new
ImageIcon(

this.getClass().getResource("/images/hello.png")));
        helloButton.setMnemonic('H');

        getContentPane().add(helloButton);
    }
}
```

Output :



EXPERIMENT 11.3

AIM : Change the component color by choosing a color from ColorChooser

Theory :

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

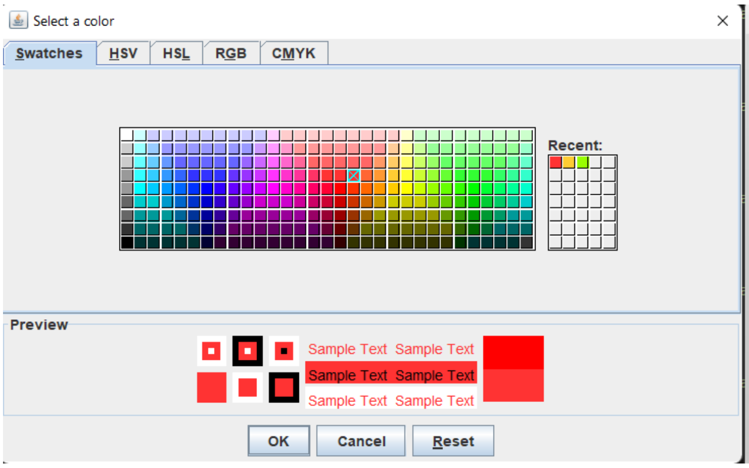
Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

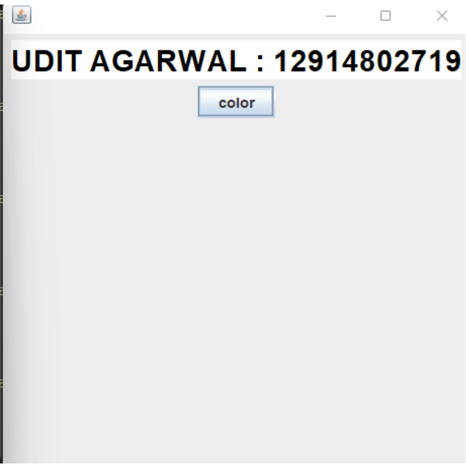
JColorChooser : The JColorChooser class is used to create a color chooser dialog box so that user can select any color. It inherits JComponent class.

Source Code :

```
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;
public class exp3 extends
        JFrame implements ActionListener {
    JButton b = new JButton("color");
    protected JLabel label;
    Container c = getContentPane();
    exp3() {
        label = new JLabel("UDIT AGARWAL : 12914802719",
                JLabel.CENTER);
        label.setForeground(Color.BLACK);
        label.setBackground(Color.WHITE);
        label.setOpaque(true);
        label.setFont(new Font("SansSerif", Font.BOLD, 25));
        c.setLayout(new FlowLayout());
        b.addActionListener(this);
        c.add(label);
        c.add(b);
    }
    public void actionPerformed(ActionEvent e) {
        Color initialcolor = Color.RED;
        Color color = JColorChooser.showDialog(this,
                "Select a color", initialcolor);
        label.setForeground(color);
    }
    public static void main(String[] args) {
        exp3 ch = new exp3();
        ch.setSize(400, 400);
        ch.setVisible(true);
        ch.setDefaultCloseOperation(EXIT_ON_CLOSE);
    }
}
```

Output :

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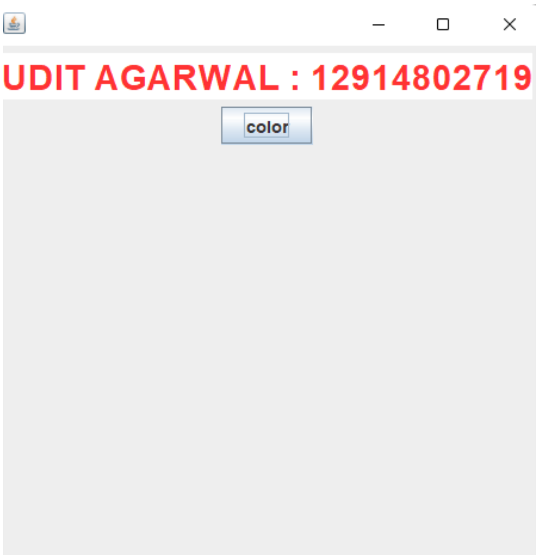
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EXPERIMENT 11.4

AIM : Display the digital watch in swing tutorial

Theory :

Java swing : Java Swing tutorial is a part of Java Foundation Classes (JFC) that is *used to create window-based applications*. It is built on the top of AWT (Abstract Windowing Toolkit) API and entirely written in java.Unlike AWT, Java Swing provides platform-independent and lightweight components. The javax.swing package provides classes for java swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, JColorChooser etc.

Thread : Threads allows a program to operate more efficiently by doing multiple things at the same time. Threads can be used to perform complicated tasks in the background without interrupting the main program.

JFrame : The javax.swing.JFrame class is a type of container which inherits the java.awt.Frame class. JFrame works like the main window where components like labels, buttons, textfields are added to create a GUI. Unlike Frame, JFrame has the option to hide or close the window with the help of setDefaultCloseOperation(int) method

Jbutton : The JButton class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed. It inherits AbstractButton class.

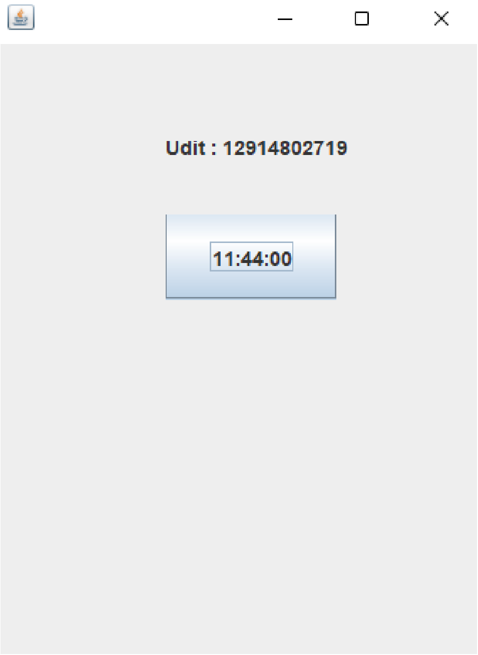
Source Code :

```
import javax.swing.*;
import java.awt.*;
import java.text.*;
import java.util.*;

public class exp4 implements Runnable {
   JFrame f;
   Thread t = null;
   int hours = 0, minutes = 0, seconds = 0;
   String timeString = "";
   JButton b;
   JLabel l1;
```

```
exp4() {
   f = new JFrame();

   t = new Thread(this);
   t.start();
   b = new JButton();
   b.setBounds(100, 100, 100, 50);
   l1 = new JLabel("Udit : 12914802719");
   l1.setBounds(100, 10, 170, 100);

   f.add(l1);
   f.add(b);
   f.setSize(300, 400);
   f.setLayout(null);
   f.setVisible(true);
}

public void run() {
   try {
      while (true) {

         Calendar cal = Calendar.getInstance();
         hours = cal.get(Calendar.HOUR_OF_DAY);
         if (hours > 12)
            hours -= 12;
         minutes = cal.get(Calendar.MINUTE);
         seconds = cal.get(Calendar.SECOND);

         SimpleDateFormat formatter = new SimpleDateFormat("hh:mm:ss");
         Date date = cal.getTime();
         timeString = formatter.format(date);

         printTime();

         t.sleep(1000);
      }
   } catch (Exception e) {
   }
}

public void printTime() {
   b.setText(timeString);
}

public static void main(String[] args) {
   new exp4();
```

```
    }
}
```

Output :



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EXPERIMENT 11.5

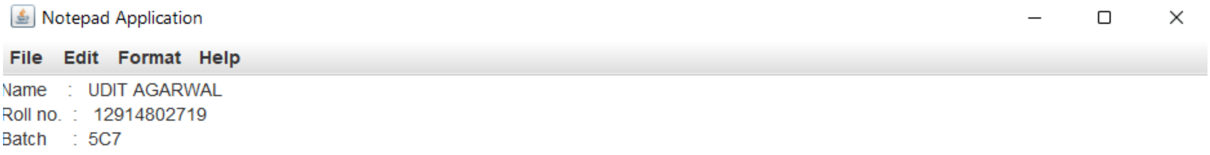
AIM : Create a notepad in swing

Source Code :

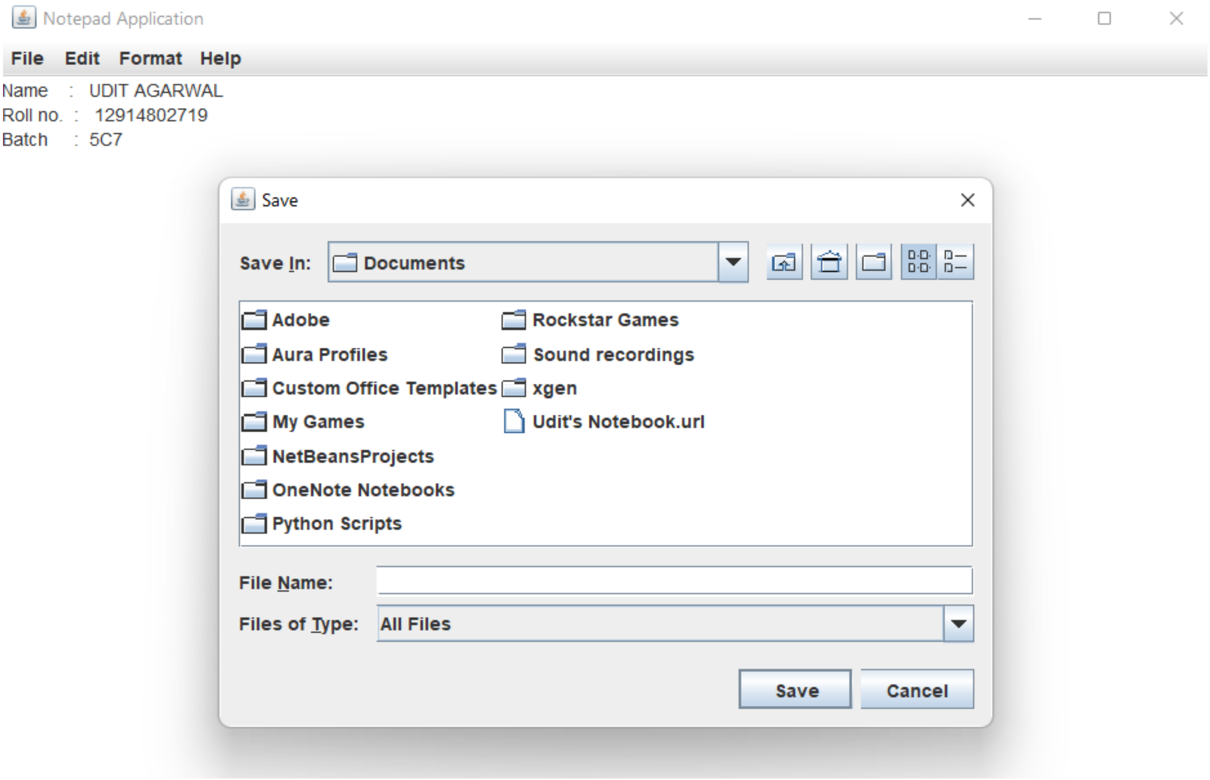
```
import java.awt.*;
import java.awt.datatransfer.Clipboard;
import java.awt.datatransfer.DataFlavor;
import java.awt.datatransfer.Transferable;
import java.awt.event.*;
import java.io.File;
import java.io.PrintWriter;
import java.util.Scanner;

import javax.swing.*;

public class Notepad extends JFrame {

     private static final long serialVersionUID = 1L;
     JFrame frame;
     JMenuBar menuBar;
     JMenu file;
     JMenu edit;
     JMenuItem open, newFile,save, exit;
     JMenuItem undo,paste, selectAll ;
     JMenu format;
     JMenu help;
     JFileChooser fileChooser;
     JTextArea textArea;
     Clipboard clip ;

     Notepad() {
          frame = new JFrame("Notepad Application");
          file = new JMenu("File");
          edit = new JMenu("Edit");
          format = new JMenu("Format");
          help = new JMenu("Help");

          newFile = new JMenuItem("New");
          open = new JMenuItem("Open");
          save = new JMenuItem("Save");
          exit = new JMenuItem("Exit");
          undo = new  JMenuItem("Undo
Ctrl+Z");
          paste = new JMenuItem("Paste
Ctrl+V");
          selectAll = new JMenuItem("Select All       Ctrl+A
");
```

```
          textArea = new JTextArea();
          fileChooser = new JFileChooser();
          menuBar = new JMenuBar();

          frame.setLayout(new BorderLayout());

     frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

        frame.add(textArea);
          file.add(open);
          file.add(newFile);
          file.add(save);
          file.add(exit);
          edit.add(undo);
          edit.add(paste);
          edit.add(selectAll);
          menuBar.add(file);
          menuBar.add(edit);
          menuBar.add(format);
          menuBar.add(help);

          frame.setJMenuBar(menuBar);

          OpenListener openL = new OpenListener();
          NewListener NewL = new NewListener();
          SaveListener saveL = new SaveListener();
          ExitListener exitL = new ExitListener();
          open.addActionListener(openL);
          newFile.addActionListener(NewL);
          save.addActionListener(saveL);
          exit.addActionListener(exitL);
          //UndoListener UndoL = new UndoListener();
          PasteListener pasteL = new PasteListener();
          //EditListener EditL = new EditListener();
          //SelectListener SelectL = new SelectListener();
          //undo.addActionListener(UndoL);
          //paste.addActionListener(EditL);
          //selectAll.addActionListener(SelectL);
          frame.setSize(800, 600);
          frame.setVisible(true);
     }

     class OpenListener implements ActionListener {
          public void actionPerformed(ActionEvent e) {
               if (JFileChooser.APPROVE_OPTION ==
fileChooser.showOpenDialog(frame)) {
                    File file = fileChooser.getSelectedFile();
                    textArea.setText("");
                    Scanner in = null;
                    try {
                         in = new Scanner(file);
                         while(in.hasNext()) {
                              String line = in.nextLine();
                              textArea.append(line+"\n");
                         }
                    } catch (Exception ex) {
                         ex.printStackTrace();
                    } finally {
                         in.close();
                    }
               }
          }
     }

     class SaveListener implements ActionListener {
          public void actionPerformed(ActionEvent e) {
               if (JFileChooser.APPROVE_OPTION ==
fileChooser.showSaveDialog(frame)) {
                    File file = fileChooser.getSelectedFile();
                    PrintWriter out = null;
                    try {
                         out = new PrintWriter(file);
                         String output = textArea.getText();
                         System.out.println(output);
                         out.println(output);
                    } catch (Exception ex) {
                         ex.printStackTrace();
                    } finally {
                         try {
                              out.flush();
                              } catch(Exception ex1)
                              {

                              }
                         try {
                              out.close();
                              } catch(Exception ex1) {

                              }
                    }
               }
          }
     }

     class NewListener implements ActionListener {
          public void actionPerformed(ActionEvent e) {
               textArea.setText("");
               //frame.add(newFile);
               //textArea.(newFile+"\n");
          }
     }
     class ExitListener implements ActionListener {
          public void actionPerformed(ActionEvent e) {
               System.exit(0);
          }
     }
          class PasteListener implements ActionListener {
          public void actionPerformed(ActionEvent e) {
               Transferable cliptran =
clip.getContents(Notepad.this);
              try
                  {
                  String sel = (String)
cliptran.getTransferData(DataFlavor.stringFlavor);

textArea.replaceRange(sel,textArea.getSelectionStart(),textAre
a.getSelectionEnd());
              }
              catch(Exception exc)
                  {
                  System.out.println("not string flavour");
              }

          }
     }


     public static void main(String args[]) {
          Notepad n = new Notepad();
     }
}
```

Output :



```
Name   :  UDIT AGARWAL
Roll no. :  12914802719
Batch   :  5C7
```



Name : UDIT AGARWAL
Roll no. : 12914802719
Batch : 5C7

VIVA QUESTIONS :

Q1) What is Java Swing?

Ans. It is a part of JFC (Java Foundation Classess) that is used to create window-based applications.

Java Swing components are platform independent and lightweight .

Q2) What are the methods of component class in Java Swing?
Ans. There are four types of methods of component class are:

- public void add(Component c)
- public void setSize(int width, int height)
- public void setLayout(LayoutManager m)
- public void setVisible(boolean b)

Q3) How many ways to create a frame in Java Swing ?
Ans. There are two ways to create a frame:

- By Association(creating the object of Frame class)
- By Inheritance(extending Frame class)

Q4) What are differences between Swing and AWT?
Ans. There is couple of differences between swing and AWT.

- AWT component are considered to be heavyweight while Swing component are lightweights.
- Swing has plug gable look and feel.
- AWT is platform dependent same GUI will look different platform while Swing is developed in Java and is platform dependent.

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