	PUNE INSTITUTE OF COMPUTER TECHNOLOGY, PUNE -43		
	Department of Electronics and Telecommunication Engineering		
	ASSESSMENT YEAR: - 2021-22		**CLASS: - TE-V**
	Subject: - Advanced Java Programming		
Expt. No: 03	**LAB Ref: ETC/2021-22/**	**ROLL NO: 32147**	**SUBMISION DATE:28-04-22**

Title: - swapping of two TextField values

Problem Statement: - Write a program in Java to perform swapping of two TextField values. Use action listener mechanism

Objectives: -

1. To learn the concepts of Action Listener

Theory

1. Frame:

The Frame is the container that contain title bar and border and can have menu bars.

It can have other components like button, text field, scrollbar etc. Frame is most widely used container while developing an AWT application.

A Frame is a top-level window with a title and a border.

The size of the frame includes any area designated for the border. The dimensions of the border area may be obtained using the getInsets method, however, since these dimensions are platform-dependent, a valid insets value cannot be obtained until the frame is made displayable by either calling pack or show A frame may have its native decorations (i.e. Frame and Titlebar) turned off with setUndecorated. This can only be done while the frame is not displayable.

```
Frame f = new Frame(GraphicsConfiguration gc);
    Rectangle bounds = gc.getBounds();
    f.setLocation(10 + bounds.x, 10 + bounds.y);
```

Frame is a subclass of Window and contains title, border and menu bars.

It comes with a resizing canvas and is the most widely used container for developing AWT applications.

It is capable of holding various components such as buttons, text fields, scrollbars, etc.

2. TextField:

The textField component allows the user to edit single line of text.When the user types a key in the text field the event is sent to the TextField.

The key event may be key pressed, Key released or key typed.

The key event is passed to the registered KeyListener.

t is also possible to for an ActionEvent if the ActionEvent is enabled on the textfield then ActionEvent may be fired by pressing the return key.

public class TextField
extends TextComponent

S.N.	Constructor & Description
1	**TextField()** Constructs a new text field.
2	**TextField(int columns)** Constructs a new empty text field with the specified number of columns.
3	**TextField(String text)** Constructs a new text field initialized with the specified text.
4	**TextField(String text, int columns)** Constructs a new text field initialized with the specified text to be displayed, and wide enough to hold the specified number of columns.

3. Button:

A button is basically a control component with a label that generates an event when pushed

The **Button** class is used to create a labeled button that has platform independent implementation. The application result in some action when the button is pushed.

When we press a button and release it, AWT sends an instance of **ActionEvent** to that button by calling **processEvent** on the button.

Following table shows the types of Button class constructors

Sr. no.	Constructor	Description
1.	Button( )	It constructs a new button with an empty string i.e. it has no label.
2.	Button (String text)	It constructs a new button with given string as its label.

4. ActionListener:

The Java ActionListener is notified whenever you click on the button or menu item. It is notified against ActionEvent. The ActionListener interface is found in java.awt.event package. It has only one method: actionPerformed().

The class which processes the ActionEvent should implement this interface.The object of that class must be registered with a component.

When the action event occurs, that object's actionPerformed method is invoked.

Following is the declaration for **java.awt.event.ActionListener** interface:

public interface ActionListener
extends EventListener

S.N.	Method & Description
1	**void actionPerformed(ActionEvent e)** Invoked when an action occurs.

5. Color class:

The Color class is a part of Java Abstract Window Toolkit(AWT) package.

The Color class creates color by using the given RGBA values where RGBA stands for RED, GREEN, BLUE, ALPHA or using HSB value where HSB stands for HUE, SATURATION, BRIcomponents

The value for individual components RGBA ranges from 0 to 255 or 0.0 to 0.1.

1. **Color(ColorSpace c, float[] co, float a)** : Creates a color in the specified ColorSpace with the color components specified in the float array and the specified alpha.
2. **Color(float r, float g, float b)** : creates a opaque color with specified RGB components(values are in range 0.0 – 0.1)
3. **Color(float r, float g, float b, float a)** : creates a color with specified RGBA components(values are in range 0.0 – 0.1)
4. **Color(int rgb)**: Creates an opaque RGB color with the specified combined RGB value consisting of the red component in bits 16-23, the green component in bits 8 – 15, and the blue component in bits 0-7.
5. **Color(int rgba, boolean b)**: Creates an sRGB color with the specified combined RGBA value consisting of the alpha component in bits 24-31, the red component in bits 16 – 23, the green component in bits 8
   – 15, and the blue component in bits 0 – 7.
6. **Color(int r, int g, int b)** : Creates a opaque color with specified RGB components(values are in range 0 – 255)

The Color class is used to encapsulate colors in the default sRGB color space or colors in arbitrary color spaces identified by a ColorSpace . Every color has an implicit alpha value of 1.0 or an explicit one provided in the constructor.

Color provides 13 standard colors as named-constants. They are: Color. RED , GREEN , BLUE , MAGENTA , CYAN , YELLOW , BLACK , WHITE , GRAY , DARK_GRAY , LIGHT_GRAY , ORANGE , and PINK . (In JDK 1.1, these constant names are in lowercase, e.g., red.

The default color space for the Java 2D API is sRGB, a proposed standard RGB color space. For further information on sRGB

Diagram: -

Learning Outcomes: -		
	1	To understand the button and TextField
	2	To learn concept of actionlistener
	3	To learn the concept of frame

Continuous Assessment			
RPP (out of 5)	**SPO (out of 5)**	**Total (Out of 10)**	**Sign**
			Date: -

#(RPP – Regularity, Punctuality, Performance), (SPO – Submission, Presentation, Oral)

Important Questions: -
1. What is ActionListener
2. Which is a component in AWT that can contain another components like buttons, textfields, labels etc.?
3. What are the methods in ActionListener interfac
4. Explain the ActionPerformed method
5. How color class is use to implement the different colors