1. Write an application with a GUI that displays a button labeled reverse and two text fields. The first text field accepts a string, and the second displays the string in reverse. The reverse string should be displayed either when the cursor is in the first text field and the Enter key is pressed, or when the reverse button is clicked. That is, your listener must handle events generated by either the text field or the button.

2. Write a program that calculates the grade point average (GPA) of up to five letter grades each of which can be A, B, C, D, or F. Use five separate text field (labeled “Grade 1,” “Grade 2,” etc) for grade input, and use label for output. Your program does not need to respond to events generated by a text field. Instead, include a button labeled calculate along with a listener class that responds to a button event. Handle erroneous data (Grades must be A, B, C, D, or F) with an appropriate message. When calculating the GPA, a value of 4 is assigned to A, 3 to B, 2 to C, etc. There should also be a button to clear the text fields, and an exit button.

3. Write a program that displays three buttons with the images of three of your favorite TV or movie characters. Imagine that a person votes for his/her favorite character by clicking the button that shows the candidate of his/her choice. Display the current number of votes above each button. Include a finished button that erases the images of the losers, and displays only the winner’s image with the total number of votes. Be sure to consider a tie.

You can find pictures of Bart, Homer, and Marge on the course website (Other Stuff).

The background should be black, the type should be white using Arial font point size 48. Also, after Finish is clicked no new votes can be added to the totals.

You GUI should look like this.

You can use setVisible with a button.
4. A combo box is a familiar component that offers a selection of items such that a user may choose exactly one item. The figure below shows a combo box that presents a user with a choice of four colors.

A combo box displays one item unless the arrow is clicked

Here are the basics:

**Class:** JComboBox

**Generates:**
- ActionEvent when an item is selected;
- An ItemEvent object **knows what item was selected**
  
  The method
  
  Object getItem()

  returns the selected item,

**Listener:** Implements ActionListener (and/or ItemListener).

**Listener method to implement:** void actionPerformed(ActionEvent e) or void itemStateChanged(ItemEvent e)

**Register a listener:** void addActionListener(ActionEvent a)

  void addItemListener(ItemEvent i)

**Constructors:**
- JComboBox()
- JTComboBox(Object[] options)

  creates a combo box, initialized with options. The parameter options may be an array of any Object, but is usually an array of String.

**Some JComboBox Methods:**
- Object getSelectedItem()

  returns the selected item or null if no value is selected.
- int getSelectedIndex()

  returns the selected index or -1 if no item is selected.
- int getItemCount()

  returns the number of options.
- void addItem(Object x)

  adds an item to the end of the list of options.
- void removeItemAt(int i)

  removes the item at index i.
- void removeItem(Object s)
  removes item s from the list of options.

- void removeAllItems()
  removes all options.

- void addActionListener(ActionListener x), and

- addItemListener(ItemListener x)

The following segment instantiates a combo box called colorOption with the choices Red, Blue, Green, and Yellow:

```java
public class ComboColorDemo extends JFrame
{
  private JComboBox colorOption;
  private String[] colors = new String[4];

  public ComboColorDemo()
  {
    panel.setBackground(Color.RED);

    colors[0] = "Red";  // initialize names to be displayed
    colors[1] = "Blue";
    colors[2] = "Green";
    colors[3] = "Yellow";

    colorOption = new JComboBox(colors);
  }
}
```

Write a program that places the colorOption combo box in a panel with a red background. Whenever a color is selected from the combo box, the background of the panel should change appropriately. Just use one type of event, ActionEvent is enough.