Lesson 14: GUI Design and Application

1. Event Handling- The parent class for all event objects is named EventObject, which descends from the Object class. EventObject is the parent of AWTEvent, which in turn is the parent of specific event classes such as ActionEvent and ComponentEvent.

2. Menus are lists of user options; they are commonly added features in GUI programs.

3. The horizontal list of JMenus is a JMenuBar. Each JMenu can contain options, called MenuItems, or can contain submenus that also are.
   JMenus.
   JMenuBar:

   ```
   setJMenubar().
   JMenuBar mainBar = new JMenuBar ();
   ```

   To create menus as part of the menu bar we used:
   ```
   JMenu menu1 = new JMenu("File");
   JMenu menu2 = new JMenu("Colors");
   ```

   To create menu items as well we used:
   ```
   JMenuItem dark = new JMenuItem("Dark");
   JMenuItem white = new JMenuItem("White")
   ```

   JMenu Event Handling
   ```
   JMenuBar mainBar = new JMenuBar ();
   JMenu menu1 = new JMenu("File");
   menu1.addActionListener(this);
   public void actionPerformed (ActionEvent e){
   System.out.println("Selected: " + e. getActionCommand ());
   }
   ```

4. JCheckBoxMenuItem - objects appear with a check box next to them. An item can be selected (displaying a check mark in the box) or not.

5. JRadioButtonMenuItem - objects appear with a round radio button next to them. Users usually expect radio buttons to be mutually exclusive, so you usually make radio buttons part of a ButtonGroup.

   ```
   private JMenuBar mainBar = new JMenuBar();
   private JMenu menu1 = new JMenu("File");

   private JCheckBoxMenuItem check1 = new
   JCheckBoxMenuItem("Check box A");
   ```

private JRadioButtonMenuItem radio1 = new JRadioButtonMenuItem("Radio option 1");
private ButtonGroup group = new ButtonGroup();

menu1.add(check1)
menu1.add(radio1)

Event Types

User Action	Resulting Event Type
Click a button	ActionEvent
Click a component	MouseEvent
Click an item in a list box	ItemEvent
Click an item in a check box	ItemEvent
Change text in a text field	TextEvent
Open a window	WindowEvent
Iconify a window	WindowEvent
Press a key	KeyEvent

List of Listener and Events

Event	Listener(s)	Handler(s)
ActionEvent	ActionListener	actionPerformed(ActionEvent)
ItemEvent	ItemListener	itemStateChanged(ItemEvent)
TextEvent	TextListener	textValueChanged(TextEvent)
AdjustmentEvent	AdjustmentListener	adjustmentValueChanged (AdjustmentEvent)
ContainerEvent	ContainerListener	componentAdded(ContainerEvent) componentRemoved(ContainerEvent)
ComponentEvent	ComponentListener	componentMoved(ComponentEvent) componentHidden(ComponentEvent) componentResized(ComponentEvent) componentShown(ComponentEvent)
FocusEvent	FocusListener	focusGained(FocusEvent) focusLost(FocusEvent)
MouseEvent	MouseListener MouseMotionListener	mousePressed(MouseEvent) mouseReleased(MouseEvent) mouseEntered(MouseEvent) mouseExited(MouseEvent) mouseClicked(MouseEvent) mouseDragged(MouseEvent) mouseMoved(MouseEvent)
KeyEvent	KeyListener	keyPressed(KeyEvent) keyTyped(KeyEvent) keyReleased(KeyEvent)
WindowEvent	WindowListener	windowActivated(WindowEvent) windowClosing(WindowEvent) windowClosed(WindowEvent) windowDeiconified(WindowEvent) windowIconified(WindowEvent) windowOpened(WindowEvent)
MouseWheelEvent	MouseWheelListener	mouseWheelMoved(MouseWheelEvent)