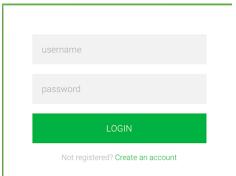
GUI (gooey)

Lecture 1(22/8/2024):

- Implement via swing package
 - Import javax.swing.[ClassName];
 - Import java.awt[ClassName];
- Event-driven programming:
 - o Programming style based on signal-and-response approach.
 - o (E.g. mouse clicks, key presses)
 - o Event: the change in the state of an object or behavior by performing actions
 - o Examples:
 - User presses a key, mouse click, close window, press button
- How:
 - o GUI components send events to listeners.
 - Event: object that acts as a signal to a listener.

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- Listener: an object that performs some action in response to an event
 - A component may have several listeners.
- Event handler:
 - Methods of the listener object that specify what happens when events are received.
 - [E.g. checkUsername() and checkPassword() will be the event handlers, when the button "login" is pressed]



o Examples:

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Click button --> play sound

- Click button --> show image
- Click button --> close window
- Common classes:
 - o Import javax.swing.<CLassName>;
 - JFrame (window)
 - JFrame window = new JFrame("Demo Program for Jframe");
 - JButton (button)
 - Jlabel (text)
 - JLabel label1 new JLabel("Hello World")
- Important methods:
 - Window.setSize(x,y) [sets the window size in pixels] (e.g. 1280x720, 1920x1080)
 - Window.setVisible(true) --> This line shows the window.
 - The reason why some are hidden, is so that you don't overload users with multiple windows at once.
 - E.g. when you start the application, you open only the "Main Menu"
 - Then when you click a button, it opens a new window, and "hides"/closes the main menu.

Lecture 2(29/8/2024):

• Today: more GUI components (text fileds, menu) & How to arrange GUI components

GUI components:

- Text field: allows user to enter single line of text
 - o JTextField in1 = new JTextField("Enter name");
 - o JTextField in2 = new JTextField(20);
- Menu (JMenu)
 - A choice on menu = menu item --> (JMenuItem)
 - o Menu bar: container for menus, typically placed near top of window interface
- Components learned:
 - o JButton; JTextfield; JMenu; JMenuItem

Layout Managers:

- Positions components inside the containers
- Component vs Container:
 - Component refers to basic elements of GUI
- BorderLayout manager: places components into 5 regions (North, South, East, West, Center)
 - One component per region
 - Center region expands to take up unused space
- FlowLayout manager: simplest manager
 - Arranges components one after another; from left to right in the order that components are added
- GridLayout arranges components in 2D grid, with rows & columns
 - If you see: GridLayout(rows,0)
 - Grid with specified number of rows, and as many columns as required
 - GridLayout(0,3), then add 6 components:

- 2 rows, 3 columns (2x3=6)
- o GridLayout(2,4), then add 2 componens:
 - 2 rows, 1 column (we only need 1 column to fit components)
- GridLayout(2,0), then add 5 components:
 - 2 rows, 3 columns (2x2=4 won't fit, but 2x3=6 will)

Action commands:

- When user clicks a button or item, an event is fired that goes to one or more action listeners.
- Action event includes a string instance
- Component vs Container:
 - o Component refers to basic elements of GUI

Lecture 3 (12/9/2024):

- Today: colours, fonts
- Demo: combining everything so far

Colors:

- An object of the class Color (from java.awt package)
- Jframe can't be colored directly
 - o The content pane will be customized
 - Frame.getContentPane().setBackground(Color.BLUE);
 - o Components:
 - Button.setBackground(Color.PINK);
- RGB color system
- Only Integers and Floats can be used for the constructors of Color. No Doubles!!
- Integers must be in the range 0-255 inclusive
- float values must be in the range 0.0-1.0 inclusive
 - o WRONG:
 - new Color(0.0, 1.0, 2.0);
 - O CORRECT:
 - new Color(0,155,255);
 - new Color(0.0f, 0.5f, 1.0f);
 - o Float = 32 bits || Double = 64 bits
 - o Therefore, double can represent larger numbers

Fonts:

- Object of the class Font (from java.awt)
- Constructor creates a font:
 - Font font1 = new Font("SansSerif", Font.PLAIN, SIZE);
 - Size: the font size
- Serifs are small lines that finish off the ends of the lines in letter
- To set the font for a Swing component, use its setFont() method.

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Lecture 4(19/9/2024):

- Today: Window Listeners, icons
- Window listener: handles events fired by the window manager
 - o Opening, Closing, Minimizing, Maximizing, Deactivating, Activating

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- o Defined: public class ClassName implements WindowListener
- o All seven methods need to be defined, but you can define their bodies as empty
- Icon: small images
 - Object of the Imagelcon class
 - o ImageIcon wavingIcon = new ImageIcon("waving.gif");

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Lecture 5(26/9/2024):

- Recap: Inheritance
 - Base/Parent/Super class
 - Derived classes inherit methods, variables from the base class
 - They can:
 - add additional instances, methods
 - Override methods
- Graphics class (found in java.awt*)
 - o Every component, element drawn on screen has a graphics object
 - Java uses a coord system (x,y axis); where (0,0) is the top left corner
 - X increases as you go right across screen --> = +; <-- = -</p>
 - Y increases as you go down across screen
 V = + ; ^ = -
 - ~
 - o The Paint method draws elements on screen.
 - Public void paint(Graphics g)

- o Repaint: changes graphics content of a window
- o setColor: changes the colour of the pen

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