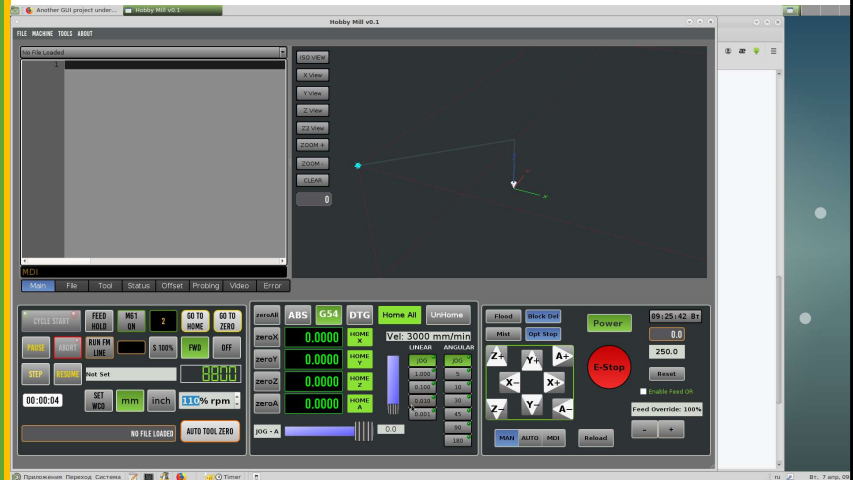


## More Graphics

CS112 –  
Java  
Programming

Spring 2024



## Last Time

We introduced the basics of Java Graphics programming

- Swing library
- Multithreading
- Events
- JFrame, JPanel, JButton, Timer, Color

Final may have questions on JPanel, JButton, Timer, Events, and Color



More Graphics  
topics

NOT ON THE FINAL

You could rush out, but

- These should be fun, useful, interesting
- We will spend the lab time working on the homework...and project for those who have not finished yet

## Layout Managers

Help with positioning subcomponents within a JPanel

- Multiple layout managers:
  - FlowLayout (default): subcomponents placed left-to-right, top-to-bottom, based on sizes
  - BorderLayout: top, bottom, left, right, center regions. Place components in one of these
  - BoxLayout: subcomponents in one column or row. Nest JPanels with different orientations
  - GridLayout: user specifies number of rows and columns of subcomponents
  - etc

Return to our program: Graphics2.java  
Add BorderLayout and show options

## Pop-up Windows

Inform user of important information: errors, failures, results complete, etc

Swing has several useful classes – here is one: `JOptionPane`

```
JOptionPane.showMessageDialog(jFrame, "The Message");  
JOptionPane.showInputDialog(jFrame, "Message Prompt");  
JOptionPane.showOptionDialog(jFrame, "MessagePrompt");
```

### Graphics2.java

Just show message & wait for user to press OK button

Prompt user to enter text, return the text

Prompt user to click YES or NO, return result as 0 or 1

More Events

## Events

So far we have looked at "ActionEvents"

- Raised by many Swing components when they are exercised

### Other lower-level events

- **Mouse events:** implements `MouseListener`
  - `mousePressed()`, `mouseReleased()`, `mouseClicked()`, `mouseEntered()`, `mouseExited()`
- **Keyboard events:** implements `KeyListener`
  - `keyTyped()`, `keyPressed()`, `keyReleased()`
- **Window events:** implements `ComponentListener`
  - `componentHidden()`, `componentShown()`, `componentMoved()`, `componentResized()`

Need to define a derived class to add all these functions! SHOW AND RUN

Events.java

`mouseClick` = press and release in the same place

`componentShown` & `Hidden` are kind of weird

`componentMoved` also weird: only if component moved with respect to its parent.

Don't need to handle this one

`componentResized` is the useful one: might have to adjust how window contents are displayed (e.g. Mandelbrot)



Still time?



## Text Fonts

Java has a variety of fonts that can be used whenever text is printed.

```
Font MyFont = new Font("Times New Roman", Font.BOLD, 12);  
JButton jб = new JButton("Press Me");  
jб.setFont(MyFont);
```

PLAIN, BOLD, ITALIC, BOLD | ITALIC

Various sizes

Show ListFonts.java