Topics for this week – interfaces and abstract classes (holdovers); Graphics and the event model (from ch 12).

Interfaces are class-like Java constructs that are a mechanism for specification- e.g. the Scoring example in the text. A very important library interface: Comparable.

When a class implements Comparable, it must provide a body for the compareTo method:

```java
public int compareTo(Object other);   // this is tricky, because other is Object
```

```java
class DogHouse implements Comparable{
    String occupant;
    int floorSpace;
    .
    public int compareTo(Object other) -> by floorSpace; by occupant (fido < spot)
    --------
    A second example -> create a boat (owner, weight) that implements Comparable
    --------
Abstract classes (intermediate between interfaces and concrete classes)
```

Graphics (I’ll do an example like TryoutPanel here); the frame (JFrame) panel (Jpanel) approach
```
import java.awt.*;
import javax.swing.*;
public class DisplayWindow extends JFrame{
    private Container c;
    
    public DisplayWindow(){
        super("Display");
        c = this.getContentPane();
    }
    
    public void addPanel(JPanel p){
        p.setPreferredSize(new Dimension(500,400));
        c.add(p);
    }
    
    public void showFrame(){
        this.pack();
        this.setVisible(true);
        this.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
```
The Event model
Underlies modern programming; fundamentally different from Scanner interaction
A button / textfield example
import java.awt.* import javax.swing.* import java.awt.event.*;

public class TextFieldPanel extends JPanel implements ActionListener{

    JButton display = new JButton("display text");
    String message = "";
    JTextField text = new JTextField(20);
    int vertical =20;

    public TextFieldPanel(){
        this.add(display);
        this.add(text);
        display.addActionListener(this);
    }

    public void paintComponent(Graphics g){
        g.drawString(message,40,vertical);
    }

    public void actionPerformed(ActionEvent e){
        if (e.getSource() == display) {
            message = text.getText();
            repaint();
            vertical = vertical + 20; }
    }
}
Display

```
display text
hello
hello
hello
```