Java

- Simpler, object-oriented, distributed, interpreted, robust, secure, architectural neutral, portable, high-performance, multithreaded, and dynamic language.
  - A simpler C/C++
  - Originally designed for consumer electronics in the early 1990's
  - Ported for Internet Usage

Java

- Object Oriented Hierarchy
- **java.awt.Frame**
  - java.awt.Window
    - java.awt.Container
      - java.awt.Component
        - java.lang.Object

Java Applets

- Applets
  - Run inside web browser
  - Use Virtual Machine provided by browser
  - Security prevents Local File I/O
  - Security prevents socket connections other than to the host web server.

Java Programs

- Stand alone (outside browser)
- Use Virtual Machine provided by JDK or other.
- No Special Security Issues
  - Runs like any other language

Java GUI

- AWT Abstract Windowing Toolkit
  - Original Java GUI controls
- SWING
  - Not Supported in web browsers w/o plugin
  - Netscape 5.0 will support natively
  - Better, more full features controls
  - Built in JDK 1.2, add in for JDK 1.1

AWT Abstract Windowing Toolkit

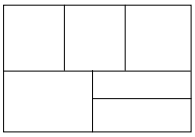
- Common Controls
  - Button
  - Canvas
  - Checkbox
  - Label
  - List
  - Panel
    - Container class

AWT Abstract Windowing Toolkit

- Frame
- Scrollbar
- Scrollpane
  - Must put controls inside here if you want to make them easily scrollable.
- TextArea
  - Multi line text editing
- TextField
  - Single line text editing

Layout Managers

- Used to position components on the screen.
- Can have multiple layout managers per screen.
- Typically each panel would have a separate layout manager



Layout Managers

- CardLayout
- FlowLayout
  - Left to right flow
  - Used for buttons
- GridBagLayout
  - Most Flexible in AWT
  - Divide area into cells
- GridLayout
  - Divide area into nice m*n grid

Layout Managers

- BorderLayout
  - All objects tied to N/S/E/W border of frame
- BoxLayout
  - Swing Only

SWING Components

- More consistent look and feel across platforms
- Light-Weight components
  - Not dependent on System specific classes
- Same names as AWT except a J is prepends the component names.

SWING Components

- Several more components including
  - JProgressBar
  - JTabbedPane
  - JToggleButton
  - JToolBar
  - JToolTip
  - JTree

Grid Bag Layout

- "Dynamic" grid. Grid dimensions are not statically assigned.
- Each component's size definition is relative to what else is in the grid.
- Grid Bag Constraints
  - Grid Height, Grid Width
    - Number of cells in row/col for components display area
  - Grid X, Grid Y
    - Relative, or fixed coordinate of object

Grid Bag Layout

- Anchor
  - Position in Cell, Center, N,E,S,W,NE,NW,SE,SW
- Fill
  - Horizontal, Vertical, Both, None
- Insets
- Internal Padding X (ipadx), Internal Padding Y (ipady)
  - Pixels to pad around component
- Weight X, Weight Y
  - Places more weight on a given row/column
  - Makes it larger with respect to the others

Java Related HTML

```
<APPLET CODEBASE = applet-url CODE=applet-filename
WIDTH=pixel-width HEIGHT=pixel-height >
<param name=parameter value=value>
<param name=parameter value=value>
</APPLET>
```

Java Help

- http://www.java.sun.com/j2ee/j2sdkee/techdocs/api/index.html
- Locally at http://java.cs.vt.edu/
- NetBeans
  - Java based IDE
  - http://www.netbeans.com/developer2/