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

- 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

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

Java Help

- Locally at http://java.cs.vt.edu/
- NetBeans
  - Java based IDE