CS202 Java Object Oriented Programming
GUI Programming – Applets

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Applet
- Embed programs in web pages
  - Remote host
    - Web page (.html)
    - Program (.class)
  - Local host
    - Browser with Java Plug-in

Running Applet
- Browser
  - URL of the web page
  - Open File – WebPageName.html
- Appletviewer
  - appletviewer WebPageName.html

Limitations of Applets
- Security restrictions
  - Cannot read/write files
  - Can only make network connections with the remote host where the applet is downloaded
- Limited support for graphics design
- Different browsers have different Java plug-ins

Dissecting a Simple Applet
- WelcomeApplet.html
- WelcomeApplet.java

WelcomeApplet.html
- Tags and attributes
  <html>
  <head>
    <title>WelcomeApplet</title>
  </head>
  <body>
    <applet code="WelcomeApplet.class" width=300 height=300>
    </applet>
  </body>
  </html>
WelcomeApplet.java

```java
import java.awt.Graphics;
import java.awt.Apple;

class WelcomeApplet extends Apple {
    public void paint(Graphics g) {
        super.paint(g);
        g.drawString("Welcome to Apple Programming!", 25, 25);
        g.drawOval(100, 100, 100);
    }
} // end of class WelcomeApplet
```

Applet as a Top-level Container

- Hold other components
  - getContentPane()
  - add( Component )
- JMenuBar( JMenuBar )
- Handling various events

JEdit Revisited

- JEdit, the Apple version
- Off-topic question: how do we reference an outer class?

Applet-specific Issues

- How do we start an applet, or when is an applet object created?
- What happens if we leaves a web page?
- What happens if we reload a web page?
- How do we end an applet?
  - System.exit() does not work, for good reasons

Life Cycle of an Applet ... Sort Of

<table>
<thead>
<tr>
<th>Browser</th>
<th>Applet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loads the web page with the applet for the first time</td>
<td>Apple object created</td>
</tr>
<tr>
<td>Leaves the web page, or minimizes the web page</td>
<td>Apple stops running</td>
</tr>
<tr>
<td>Returns to the web page, or maximizes the web page</td>
<td>Apple starts running</td>
</tr>
<tr>
<td>Reload the page</td>
<td>Apple stops running</td>
</tr>
<tr>
<td>Browser is closed</td>
<td>Apple stops running</td>
</tr>
</tbody>
</table>

The Milestone Methods

- Milestone methods
  - public void init()
  - public void start()
  - public void stop()
  - public void destroy()
- init() vs. constructor
Other Applet Methods

- `showStatus( String )`
- `AppletLife.java`
- `getWidth(), getHeight()`
- `String getParameter( String name )`