

Java Applets and Game Development

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What is a Java Applet?

- A Java application that can run in a web browser.
- The applet is downloaded from a web server and embedded inside of a web page.
- It can run on any web browser that has a Java Runtime Environment Plugin.
- Multi-platform (Linux, Unix, Mac, Windows)

Its use for Games...

- Applets are a great way to make portable multi-platform games.



- They are used to run game clients like Minecraft and Runescape.

Educational Value

- Learning to program games in java applets can help enhance programming skill and understanding.
- Help Maintain interest in programming.

Where to start?

- Parts needed for a game...
 - Game Objects
 - Game Loop
 - Controller (Keyboard / Mouse)
 - Graphics
 - Sound

Applet Init

- Just like a constructor.
- Initializes the global variables created outside the init.

```
Thread main;  
Image buffer;  
boolean game_start;  
Graphics bufferG;  
Random rand;  
  
public void init()  
{  
    main=new Thread(this);  
    buffer=createImage(this.getWidth(),this.getHeight());  
    bufferG=buffer.getGraphics();  
    game_start = true;  
    this.addKeyListener(this);  
    this.addMouseListener(this);  
    main.start();  
}
```

Controller

- How the users control the game.
- KeyEvent and MouseEvent are used to handle what to do when a user uses a controller.

```
public void keyPressed(KeyEvent e)
{
    if(e.getKeyCode()==KeyEvent.VK_SPACE)
    {
        //Do Something Awesome
    }
}
```

Game Loop

- This is where all of the game magic happens.
- Gives Game Objects the ability to move and interact with other Game Objects.
- Uses a Java Thread.
- Basically a constant loop. (just like a while loop)

Java Thread?

```
public void run()
{
    while(game_start)
    {
        try
        {
            Thread.sleep(20);
        }
        catch(Exception e) {}
    }
}
```

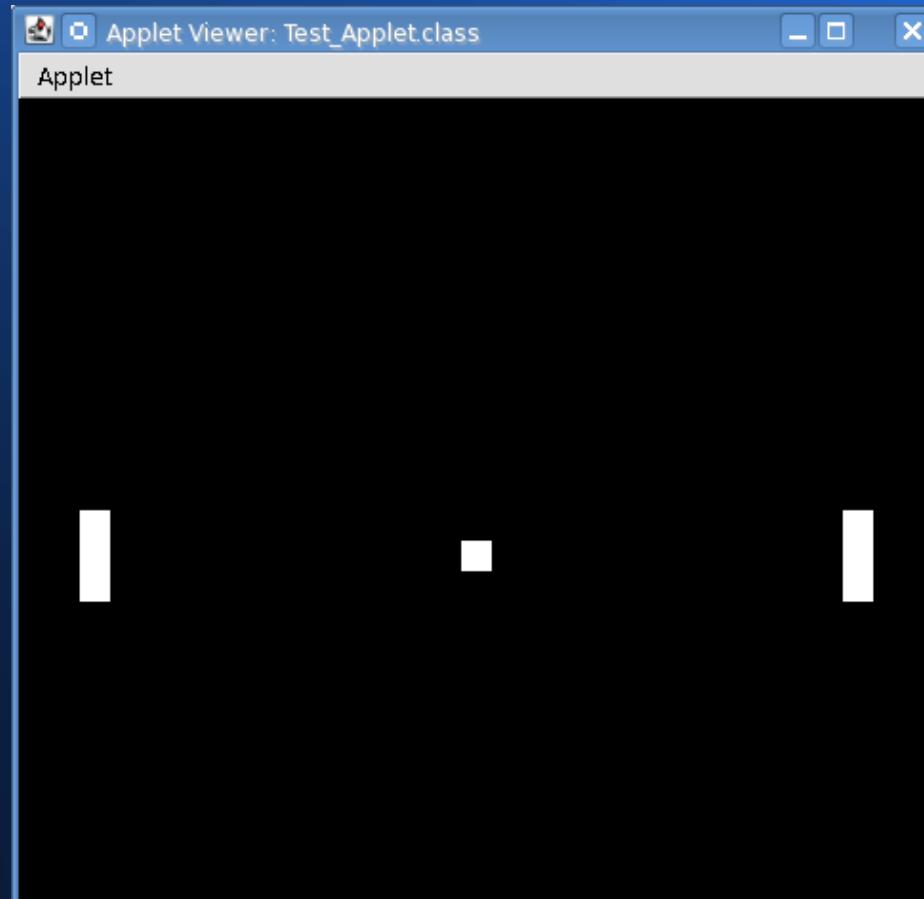
- When an Applet Initializes, the game loop is started.
- After each pass through, the Thread Sleeps for a given number of milliseconds.

Graphics Buffer

```
public void update(Graphics g)
{
    paint(g);
}
public void paint(Graphics g)
{
    bufferG.setColor(Color.white);
    bufferG.fillRect(0,0,1024,768);
    bufferG.drawString("Hello World!", 20, 20);
    g.drawImage(buffer,0,0,this);
}
```

- When you want to refresh the applets screen you use a method called repaint().
- Repaint() by default clears the screen with white and paints the updated graphics.
- This causes a lot of flicker making a game unplayable.
- Using a buffer fixes that problem.

Pong Applet



Embedding The Applet

- Adding the <Applet> tag to any webpage will add the Applet.
- The generated class files in /bin/ from eclipse are needed.

```
<html>  
<applet code="Pong.class" width="480" height="480">  
</applet>  
</html>
```

Where To Go Next?

- Using the Moving Object Class,
 - Make a space shooter game
 - Change a paddle into a ship, a ball into a laser, and the other paddle as an enemy ship.
 - Make a breakout type game
 - Use one paddle, one ball, and create an array of Blocks (Using Moving Objects is fine)

Questions?