Applets Programming

Submitted by:
Ms. Saroj Kumari
Assistant Professor
Computer Science and Engineering ,MAIT
Maharaja Agrasen University

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Introduction to Applet Programming

A Java Applet is a small Java program that runs inside a web browser or an applet viewer. It is embedded in an HTML file using the `<applet>` or `<object>` tags to enhance web pages with dynamic and interactive content. Unlike standalone Java applications, applets are executed by the Java Virtual Machine (JVM) within a browser. For security reasons, they run in a restricted environment called a sandbox, which prevents access to local system resources.

Features of Applets

- Applets run inside a web page.
- They don’t have a main() method like regular Java applications.
- They are executed using a browser or applet viewer.
- They are secure and cannot access local system resources directly.
- Applets are event-driven and do not require explicit execution like standalone applications.
- They use the Abstract Window Toolkit (AWT) for graphical user interface (GUI) components.

Types of Applets

Here are two types of applets based on their source and execution context:

1. **Local Applet**

- Loaded from the local file system or development environment.
- Often run using tools like the applet viewer during development and testing.

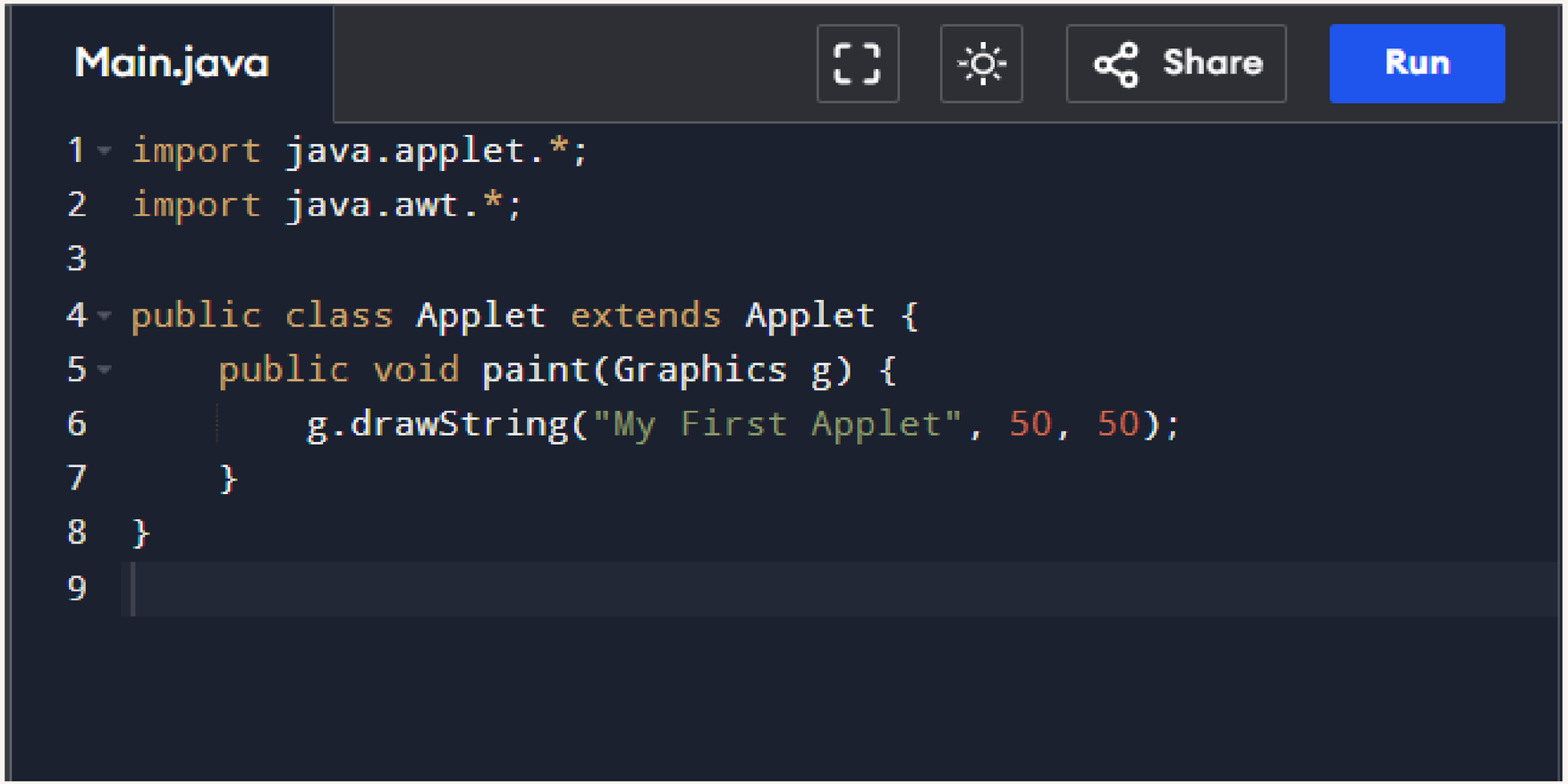
2. **Remote Applet**

- Loaded from a remote web server and embedded in a web page.
- Executed within a Java-enabled web browser, subject to security restrictions (sandbox).

Difference Between Java Application and Java Applet

Feature	Java Application	Java Applet
Execution	Runs independently as a standalone program	Runs inside a web browser or an applet viewer.
Main Method	Requires a main() method for execution.	Does not use a main() method; execution is controlled by the browser or applet viewer.
User Interface	Uses Java's AWT, Swing, or JavaFX for UI components.	Uses AWT for UI but runs within a webpage.
Security	Has full access to system resources like files, network, and local storage.	Uses AWT for UI but runs within a webpage.
Security	Has full access to system resources like files, network, and local storage.	Runs in a restricted environment (sandbox), preventing direct access to local system resources.
Usage	Used for software development, enterprise applications, and system tools.	Used for web-based animations, games, and small interactive features.

Building an Applet Code



Save this file as Applet.java.

Applet Lifecycle

Java Applets have a lifecycle managed by the browser or applet viewer. The key methods in an applet's lifecycle are:

- init() – Executed once when the applet is initialized.
- start() – Called every time the applet is restarted.
- paint(Graphics g) – Handles the drawing of the applet's content.
- stop() – Called when the applet is stopped (e.g., when switching tabs).
- destroy() – Called when the applet is permanently removed from memory.

Functionality of Java Applets

Main.java

Share

Run

```java
import java.applet.*;
import java.awt.*;

public class LifecycleApplet extends Applet {
    public void init() {
        System.out.println("Applet initialized");
    }

    public void start() {
        System.out.println("Applet started");
    }

    public void paint(Graphics g) {
        g.drawString("Applet Lifecycle Example", 20, 20);
    }

    public void stop() {
        System.out.println("Applet stopped");
    }

    public void destroy() {
        System.out.println("Applet destroyed");
    }
}
```

Creating an Executable Applet

To compile and run the applet:

- Compile the Java file:

  javac Applet.java

- Run using AppletViewer:

  appletviewer MyApplet.html

Adding an Applet to an HTML File

```
<html>
<body>
    <applet code="Applet.class" width="300"
height="200">
    </applet>
</body>
</html>
```

Designing a Web Page for an Applet of Applets

When designing a web page with applets:

- Use the <applet> tag to load the Java applet.
- Ensure the .class file is in the correct location.
- Add interactive elements like buttons and forms for user interaction.

Passing Parameters to an Applet

You can pass parameters to an applet using the <param> tag inside the HTML file.

```
<applet code="ParamApplet.class" width="300" height="200">
    <param name="message" value="Hello, this is a parameter!">
</applet>
```

Main.java

Share Run

```java
import java.applet.*;
import java.awt.*;

public class ParamApplet extends Applet {
    String message;

    public void init() {
        message = getParameter("message");
        if (message == null) {
            message = "Default Message";
        }
    }

    public void paint(Graphics g) {
        g.drawString(message, 50, 50);
    }
}
```

Thank you