

Lab 12

APPLET (Study Experiment)

Q1. What is Applet?

An applet is a Java program that runs in a Web browser. An applet can be a fully functional Java application because it has the entire Java API at its disposal.

There are some important differences between an applet and a standalone Java application, including the following:

1. An applet is a Java class that extends the `java.applet.Applet` class.
2. A `main()` method is not invoked on an applet, and an applet class will not define `main()`.
3. Applets are designed to be embedded within an HTML page.
4. When a user views an HTML page that contains an applet, the code for the applet is downloaded to the user's machine.
5. A JVM is required to view an applet. The JVM can be either a plug-in of the Web browser or a separate runtime environment.
6. The JVM on the user's machine creates an instance of the applet class and invokes various methods during the applet's lifetime.
7. Applets have strict security rules that are enforced by the Web browser. The security of an applet is often referred to as sandbox security, comparing the applet to a child playing in a sandbox with various rules that must be followed.
8. Other classes that the applet needs can be downloaded in a single Java Archive (JAR) file.

Q2. Life cycle of an applet.

In Java, an applet is a special type of program embedded in the web page to generate dynamic content. Applet is a class in Java.

The applet life cycle can be defined as the process of how the object is created, started, stopped, and destroyed during the entire execution of its application. It basically has five core methods namely `init()`, `start()`, `stop()`, `paint()` and `destroy()`. These methods are invoked by the browser to execute.

Along with the browser, the applet also works on the client side, thus having less processing time.

There are five methods of an applet life cycle, and they are:

- **init():** The `init()` method is the first method to run that initializes the applet. It can be invoked only once at the time of initialization. The web browser creates the initialized objects, i.e., the web browser (after checking the security settings) runs the `init()` method within the applet.
- **start():** The `start()` method contains the actual code of the applet and starts the applet. It is invoked immediately after the `init()` method is invoked. Every time the browser is loaded or refreshed, the `start()` method is invoked. It is also invoked whenever the applet is maximized, restored, or moving from one tab to another in the browser. It is in an inactive state until the `init()` method is invoked.
- **stop():** The `stop()` method stops the execution of the applet. The `stop()` method is invoked whenever the applet is stopped, minimized, or moving from one tab to another in the browser, the `stop()` method is invoked. When we go back to that page, the `start()` method is invoked again.
- **destroy():** The `destroy()` method destroys the applet after its work is done. It is invoked when the applet window is closed or when the tab containing the webpage is closed. It removes the applet object from memory and is executed only once. We cannot start the applet once it is destroyed.
- **paint():** The `paint()` method belongs to the `Graphics` class in Java. It is used to draw shapes like circle, square, trapezium, etc., in the applet. It is executed after the `start()` method and when the browser or applet windows are resized.

Q3. Create Hello World applet.

```
import java.applet.Applet;
import java.awt.Graphics;

public class HelloWorldApplet extends Applet {
    public void paint(Graphics g) {
        g.drawString("Hello World", 50, 50);
    }
}
```