MODULE IV

JAVA PROGRAMMING

Java Applet

Applet is a special type of program that is embedded in the webpage to generate the dynamic content. It runs inside the browser and works at client side.
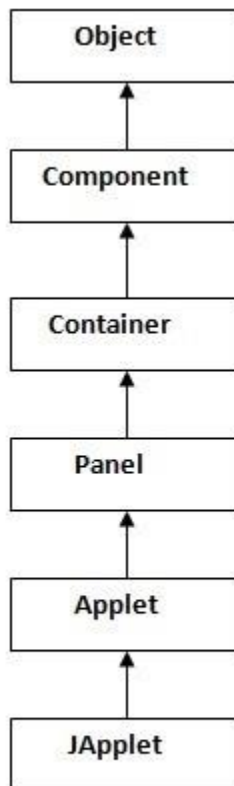
Advantage of Applet

There are many advantages of applet. They are as follows:

It works at client side so less response time.

Secured

It can be executed by browsers running under many plateforms, including Linux, Windows, Mac Os etc.

Hierarchy Of Applet

As displayed in the above diagram, Applet class extends Panel. Panel class extends Container which is the subclass of Component.

1. Lifecycle of Java Applet

2. Applet is initialized.

3. Applet is started.

4. Applet is painted.

5. Applet is stopped.

6. Applet is destroyed.
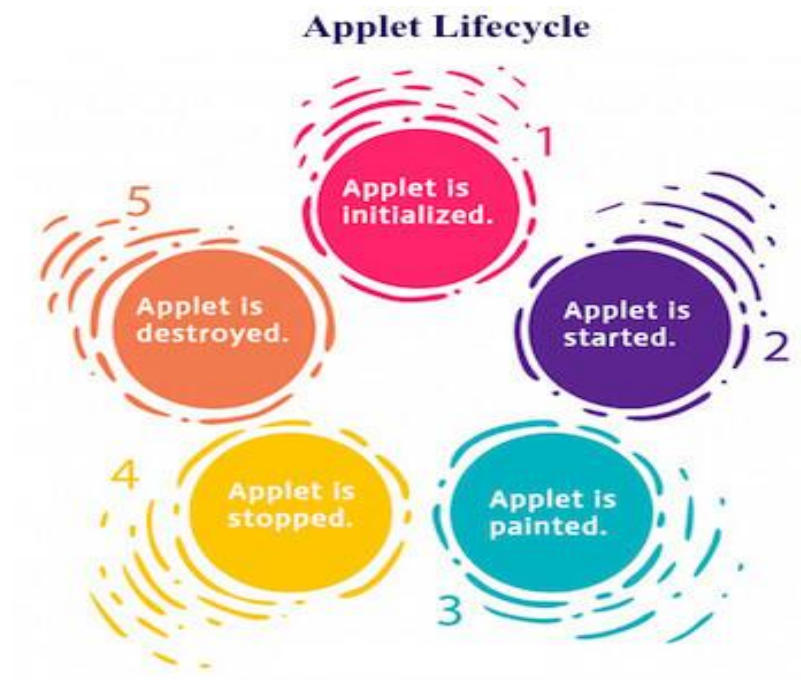
Lifecycle methods for Applet:

The java.applet.Applet class 4 life cycle methods and java.awt.Component class provides 1 life cycle methods for an applet.

java.applet.Applet class

For creating any applet java.applet.Applet class must be inherited. It provides 4 life cycle methods of applet.

public void init(): is used to initialized the Applet. It is invoked only once.

public void start(): is invoked after the init() method or browser is maximized. It is used to start the Applet.

public void stop(): is used to stop the Applet. It is invoked when Applet is stop or browser is minimized.

public void destroy(): is used to destroy the Applet. It is invoked only once.

java.awt.Component class

The Component class provides 1 life cycle method of applet.

public void paint(Graphics g): is used to paint the Applet. It provides Graphics class object that can be used for drawing oval, rectangle, arc etc.

Who is responsible to manage the life cycle of an applet?

Java Plug-in software.

How to run an Applet?

There are two ways to run an applet

- By html file.

- By appletViewer tool (for testing purpose).

Simple example of Applet by html file:

To execute the applet by html file, create an applet and compile it. After that create an html file and place the applet code in html file. Now click the html file.

//First.java

import java.applet.Applet;

import java.awt.Graphics;

public class First extends Applet{

public void paint(Graphics g){

g.drawString("welcome",150,150);

} }

myapplet.html

<html>

<body>

<applet code="First.class" width="300" height="300">

</applet>

</body>

</html>

Simple example of Applet by appletviewer tool:

To execute the applet by **appletviewer** tool, create an applet that contains applet tag in comment and compile it. After that run it by: appletviewer First.java. Now Html file is not required but it is for testing purpose only.

//First.java

import java.applet.Applet;

import java.awt.Graphics;

public class First extends Applet{

public void paint(Graphics g){

g.drawString("welcome to applet",150,150);

}

}

/*

<applet code="First.class" width="300" height="300">

</applet>

*/

To execute the applet by appletviewer tool, write in command prompt:

c:\>javac First.java

c:\>appletviewer First.java

Displaying Graphics in Applet

java.awt.Graphics class provides many methods for graphics programming.

Commonly used methods of Graphics class:

- public abstract void drawString(String str, int x, int y): is used to draw the specified string.

- public void drawRect(int x, int y, int width, int height): draws a rectangle with the specified width and height.

- public abstract void fillRect(int x, int y, int width, int height): is used to fill rectangle with the default color and specified width and height.

- public abstract void drawOval(int x, int y, int width, int height): is used to draw oval with the specified width and height.

- public abstract void fillOval(int x, int y, int width, int height): is used to fill oval with the default color and specified width and height.

- public abstract void drawLine(int x1, int y1, int x2, int y2): is used to draw line between the points(x1, y1) and (x2, y2).

- public abstract boolean drawImage(Image img, int x, int y, ImageObserver observer): is used draw the specified image.

- public abstract void drawArc(int x, int y, int width, int height, int startAngle, int arcAngle): is used draw a circular or elliptical arc.

- public abstract void fillArc(int x, int y, int width, int height, int startAngle, int arcAngle): is used to fill a circular or elliptical arc.

- public abstract void setColor(Color c): is used to set the graphics current color to the specified color.

- public abstract void setFont(Font font): is used to set the graphics current font to the specified font.

Example of Graphics in applet:

import java.applet.Applet;

```java
import java.awt.*;

public class GraphicsDemo extends Applet{
public void paint(Graphics g){
g.setColor(Color.red);
g.drawString("Welcome",50, 50);
g.drawLine(20,30,20,300);
g.drawRect(70,100,30,30);
g.fillRect(170,100,30,30);
g.drawOval(70,200,30,30);
g.setColor(Color.pink);
g.fillOval(170,200,30,30);
g.drawArc(90,150,30,30,30,270);
g.fillArc(270,150,30,30,0,180);
}
}
```

myapplet.html

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

Difference between Application and Applet

1. **Definition of Application and Applet** – Applets are feature rich application programs that are specifically designed to be executed within an HTML web document to execute small tasks or just part of it. Java applications, on the other hand, are stand-alone programs that are designed to run on a stand-alone machine without having to use a browser.

2. **Execution of Application and Applet**– Applications require main method() to execute the code from the command line, whereas an applet does not require main method() for execution. An applet requires an HTML file before its execution. The browser, in fact, requires a Java plugin to run an applet.

3. **Compilation of Application and Applet**–Application programs are compiled using the "javac" command and further executed using the java command. Applet programs, on the other hand, are also compiled using the "javac" command but are executed either by using the "appletviewer" command or using the web browser.

4. **Security Access of Application and Applet** – Java application programs can access all the resources of the system including data and information on that system, whereas applets cannot access or modify any resources on the system except only the browser specific services.

5. **Restrictions of Application and Applet** – Unlike applications, applet programs cannot be run independently, thus require highest level of security. However, they do not require any specific deployment procedure during execution. Java applications, on the other hand, run independently and do not require any security as they are trusted.