

# Unit -2 SWING

# Introduction

## What is Java Foundation Classes?

- The **Java Foundation Classes**, or JFC, is a loose collection of standard Java API's for client-side graphics, graphical user interfaces (GUIs), and related programming tasks.
- They are foundation classes in the sense that most client-side Java applications are built upon these APIs.
- Some of the API's are: AWT, SWING, Java 2D, Printing, Data Transfer, Applets.

# What is Java Swing?

- Swing is a part of Java Foundation classes [JFC] library.
- It is also the extension of Abstract Window Toolkit [AWT].
- Part of the Java Foundation Classes (JFC)
- Provides a rich set of GUI components
- Used to create a Java program with a graphical user interface (GUI)
- table controls, list controls, tree controls, buttons, and labels, and so on...

## Why SWING needed?

- Swing has four times the number of User Interface [UI] components as AWT and is part of the standard java distribution.
- For today's application with GUI requirements:
- AWT is a limited implementation, not quite capable of providing the components required for developing complex GUI's required for today's application.
- The AWT component set has a quite a few bugs and really does take up a lot of system resources when compared to equivalent Swing resources.

- Later Netscape introduced its IFC [Internet Foundation Classes] library for use with java.
- It became more popular for programmers creating GUI's for commercial applications.
- The, SUN decided to act and the joint effort between SUN and Netscape produced the original Swing set of components as a part of the Java Foundation Classes [JFC]

## Difference in Swing and JFC

- It feels like JFC and Swing is one and the same thing, but it is not so.
- JFC contains Swing and quite a number of other items. Like,
- **Swing**: A large UI component package
- **Cut and Paste**: Clipboard support
- **Accessibility features**: Aimed at developing GUI's for users with disabilities.
- **The desktop colors features**: First introduced in Java 1.1
- **Java 2D**: Improved color, image and text support.

## Swing introduced significant advantages to programmers

- It's UI components use few system resources and thus are lightweight components.
- Offers a whole lot more sophisticated UI components with advanced functionality.
- It helps programmers deliver a consistent look and feel of program GUI's.

# JFC Technologies

- JFC contains two major technologies, one of which is Swing.
- JFC also contains is the AWT, Accessibility, Drag and Drop and 2D graphics.

**Accessibility API:** these are libraries that empower programmers to create GUI's for the use by disabled people who need additional help.

➤ Like, screen reader, screen magnifiers and speech recognition sub-systems.

➤ It also provides an interface that allows assistive technologies to interact and communicate with JFC and AWT components.



**Abstract Windowing Toolkit:** this is not new to java programmers.

- it is the cornerstone of the JFC itself and is one of the core libraries launched with JDK 1.0.
- Mainly, AWT is the foundation on which Swing components were built.
- Even though user interfaces can be created using Swing components,
- Layout managers and event models supported by the AWT have to be used for positioning these components on the GUI.

## 2D Graphics

- API in the AWT supports graphics to some extent.
- As java technology started being used extensively, the demand for a more sophisticated graphics API raised.
- So, JDK 1.2 has arrived with 2D graphics that enhances the existing graphics support.
- The 2D graphics API can support advanced 2D graphics and imaging.

## **Drag and Drop:**

- With native platform capabilities of drag and drop
- user with an external non java application working adjacent to a java application
- can be able to drag and drop information between the java application and the external application.

# Swing Features

- Model View architecture [MVC] is normally used when creating GUI's using swing.
- Some of the swing's key features are:
- **Lightweight Components:** Swing components can have their own view supported by Java's look and feel classes.
- **Pluggable Look and Feel:** The swing library supports a components look and feel that remains the same across all platforms wherever the program runs.

# Swing Components

- Swing is a package built on top of AWT that provides a great number of pre built classes.
- From commercial point of applications, swing's UI components are most interesting.
- Some of the swing components with its features are discussed.

# Hierarchy of Java Swing classes

The hierarchy of java swing API is given below.

