Java is one of the most popular and in-demand programming languages to learn. Thanks to its platform independence and multiplatform support, Java is a staple programming language of the IT and software sectors. Companies are always on the lookout for skilled Java Developers who can develop innovative Java projects.

Why Java?

Although Java is a relatively new programming language (**it was launched in the early 1990s**), it has created a unique niche in the IT industry. Java is the driving force behind some of the largest organizations, including Airbnb, Uber, eBay, Pinterest, Groupon, Spotify, Intel, Symantec, TCS, Infosys, Wipro, Flipkart, and TripAdvisor, to name a few.

The five main reasons for Java's popularity are:

- **Platform independence –** Java runs on the WORA (Writing Once, Run Anywhere). A Java code is compiled into an intermediate format (a.k.a. bytecode), which is then executed in the JVM (Java Virtual Machine). So, any system running a JVM can execute Java code. Furthermore, JRE (Java Runtime Environment) is compatible with all the three operating systems – Linux, macOS, and Windows.
- **Multi-threaded –** Java has inbuilt multithreading capabilities, which means that you can develop highly interactive and responsive apps with multiple concurrent threads of activity using Java.
- **Object-oriented –** Java is a purely object-oriented language. Inspired by C and C++, Java extends the functionality of these languages to become a pure object-oriented programming language. Abstraction, encapsulation, inheritance, and polymorphism are some of its core OOP features.

- **Secure –** When it comes to safety, Java incorporates a host of safety features into the runtime systems, including runtime checking and static type-checking at the time of compilation. With these features in place, it is pretty challenging to hack into a Java application from an external source.
- **Robust –** Java leverages a simple memory management model reinforced by the automatic garbage collection. Since Java objects do not require external references, Java code is robust. Besides, it also encourages developers to adopt productive programming habits for developing secure and reliable applications. The more you experiment with different **java projects**, the more knowledge you gain.

Standard uses of Java

Java is a versatile programming language, and it finds applications in many areas of software and app development. Some of the most popular applications of Java include:

Software Tools

Java is the backbone and foundation for numerous software tools. It is widely used for both open-source and commercial software projects. Eclipse, IntelliJ IDEA, BlueJ, JDeveloper, and NetBeans IDE are some of the most popular IDEs for creating Java applications and tools.

Android Applications

Java used for writing code for Android applications. Eclipse IDE is perhaps the most extensively used development environment for writing and building Android apps. Kotlin, the programming language designed explicitly for JVM and Android platform, is also heavily inspired by Java.

Web Applications

Owing to its flexibility, reliability, and high performance, Java is an excellent choice for developing web applications. Java provides support for web applications via JSPs and Servlets. Plus, you can use Java Web Application for building dynamic websites.

Scientific Applications

When it comes to scientific applications, Java is preferred over C++ since it boasts of a comprehensive suite of concurrency tools. Moreover, Java code is stable, secure, and robust, which is a prerequisite for scientific applications.

Now that you know the best features of Java and its uses let's get into the core topic of our discussion – Java projects. After completing their graduation in Software Engineering, every aspiring Java Developer is faced with the question, "What to do next?"

Case study using java programming

Fee Report | Student Management System in Java

Objective/ Vision

Fee report software where admin can add/view/delete accountant and accountant can add/view/edit/delete student, check due fee and logout.

Users of the System

1. Admin

2. Accountant

Functional Requirements

1. Admin

1. Can add/view/edit/delete accountant
2. Can logout

2. Accountant

1. Can add/view/edit/delete students
2. Can check due fee
3. Can logout

Tools to be used

1. Use any IDE to develop the project. It may be Eclipse /Myeclipse / Netbeans etc.
2. MySQL for the database.

Front End and Back End

1. **Front End:** Java Swing
2. **Back End:** MySQL

How project works?


```
package com.javatpoint.feereport;

import java.awt.BorderLayout;

import java.awt.EventQueue;

import javax.swing.JFrame;

import javax.swing.JPanel;

import javax.swing.border.EmptyBorder;

import javax.swing.GroupLayout;

import javax.swing.GroupLayout.Alignment;

import javax.swing.JLabel;

import javax.swing.JOptionPane;


import java.awt.Font;

import java.awt.Color;
```

```
import javax.swing.JTextField;
import javax.swing.JPasswordField;
import javax.swing.JButton;
import javax.swing.LayoutStyle.ComponentPlacement;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;


public class AdminLogin extends JFrame {
	static AdminLogin frame;
	private JPanel contentPane;
	private JTextField textField;
	private JPasswordField passwordField;

	/**
	 * Launch the application.
	 */
	public static void main(String[] args) {
		EventQueue.invokeLater(new Runnable() {
			public void run() {
```

```
                    try {
                        frame = new AdminLogin();
                        frame.setVisible(true);
                    } catch (Exception e) {
                        e.printStackTrace();
                    }
                }
            });
}

/**
 * Create the frame.
 */
public AdminLogin() {
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setBounds(100, 100, 450, 300);
        contentPane = new JPanel();
        contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
        setContentPane(contentPane);
```

```
JLabel lblAdminLogin = new JLabel("Admin Login");
lblAdminLogin.setForeground(Color.DARK_GRAY);
lblAdminLogin.setFont(new Font("Tahoma", Font.PLAIN, 20));

JLabel lblName = new JLabel("Name:");

JLabel lblPassword = new JLabel("Password:");

textField = new JTextField();
textField.setColumns(10);

passwordField = new JPasswordField();

JButton btnLogin = new JButton("login");
btnLogin.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
        String name=textField.getText();
        char ch[]=passwordField.getPassword();
```

```
                String password=String.valueOf(ch);
                if(name.equals("admin")&&password.equals("admin123")){
                    String s[]={};
                    AdminSection.main(s);
                    frame.dispose();
                }else{

JOptionPane.showMessageDialog(AdminLogin.this,"Sorry, username or password error!");
                    textField.setText("");passwordField.setText("");
                }
                }
            });
            GroupLayout gl_contentPane = new GroupLayout(contentPane);
            gl_contentPane.setHorizontalGroup(
                gl_contentPane.createParallelGroup(Alignment.LEADING)
                    .addGroup(gl_contentPane.createSequentialGroup()

.addGroup(gl_contentPane.createParallelGroup(Alignment.LEADING)
```

```
        .addGroup(gl_contentPane.createSequentialGroup()
                                                .addGap(180)
                                                .addComponent(lblAdminLogin))

        .addGroup(gl_contentPane.createSequentialGroup()
                                                .addGap(25)

        .addGroup(gl_contentPane.createParallelGroup(Alignment.LEADING)
                                                        .addComponent(lblName)
                                                        .addComponent(lblPassword))
                                                .addGap(58)

        .addGroup(gl_contentPane.createParallelGroup(Alignment.TRAILING,
false)

        .addComponent(passwordField)
                                                        .addComponent(textField,
GroupLayout.DEFAULT_SIZE, 180, Short.MAX_VALUE)))

        .addGroup(gl_contentPane.createSequentialGroup()
```

```
                                        .addGap(177)
                                        .addComponent(btnLogin,
GroupLayout.PREFERRED_SIZE, 86, GroupLayout.PREFERRED_SIZE)))
                                .addContainerGap(111, Short.MAX_VALUE))
        );
        gl_contentPane.setVerticalGroup(
            gl_contentPane.createParallelGroup(Alignment.LEADING)
                .addGroup(gl_contentPane.createSequentialGroup()
                    .addComponent(lblAdminLogin)
                    .addGap(29)

.addGroup(gl_contentPane.createParallelGroup(Alignment.BASELINE)
                        .addComponent(lblName)
                        .addComponent(textField,
GroupLayout.PREFERRED_SIZE, GroupLayout.DEFAULT_SIZE,
GroupLayout.PREFERRED_SIZE))
                    .addGap(27)

.addGroup(gl_contentPane.createParallelGroup(Alignment.BASELINE)
```

```
                                        .addComponent(passwordField,
GroupLayout.PREFERRED_SIZE, GroupLayout.DEFAULT_SIZE,
GroupLayout.PREFERRED_SIZE)
                                        .addComponent(lblPassword))
                                .addGap(36)
                                .addComponent(btnLogin,
GroupLayout.PREFERRED_SIZE, 33, GroupLayout.PREFERRED_SIZE)
                                .addContainerGap(51, Short.MAX_VALUE))
                );
                contentPane.setLayout(gl_contentPane);
        }
}
```