CAPSTONE PROJECT REPORT

(Project Term August-December 2023)

(“Currency Converter”)

Submitted by

Name of Student:- Shivam Shekhar **Registration Number:- 12204084**

Course Code:- INT-216

Under the Guidance of

Waseem ud din Wani(63869)
School of Computer Science and Engineering

DECLARATION

I hereby declare that the project work entitled ("Currency Converter") is an authentic record of our own work carried out as requirements of Capstone Project for the award of B.Tech degree in Computer Science and Engineering (Data Science with ML) from Lovely Professional University, Phagwara, under the guidance of Waseem Ud Din Wani, during August – December, 2023. All the information furnished in this capstone project report is based on our own intensive work and is genuine.

Project Group Number: ……

Name of Student : ……

Registration Number: ……..

Signature of Student:
Date:

CERTIFICATE

This is to certify that the declaration statement made by this student is correct to the best of my knowledge and belief. He has completed this Capstone Project under my guidance and supervision. The present work is the result of their original investigation, effort and study. No part of the work has ever been submitted for any other degree at any University. The Capstone Project is fit for the submission and partial fulfillment of the conditions for the award of B.Tech degree in Computer Science and Engineering (Data Science with ML) from Lovely Professional University, Phagwara.

Signature and Name of the Mentor:

Designation:

School of Computer Science and Engineering,
Lovely Professional University,
Phagwara, Punjab.

Date :

ACKNOWLEDGEMENT

I want to express my gratitude to the Lovely School of Computer Science and Engineering for giving me the chance to realize my dream and accomplish my objective. I am appreciative of Waseen ud din Wani sir for giving me the go-ahead to work on this project and for providing me with all the resources I needed. I owe a debt of gratitude to Sir for his tireless assistance, invaluable time and counsel, unwavering direction, genuine collaboration, and meticulous engagement throughout the research and in finishing the task of delivering the project on schedule. Finally, I would want to express my gratitude to everyone, especially my friends, who have helped to create a suitable, healthy, and accommodating atmosphere as well as include new and fresh creative concepts for me throughout the undertaking. It would have been quite tough for me to prepare the assignment in a time-bound manner without their assistance.

1. ACKNOWLEDGEMENT

The successful completion of this project would not have been possible without the invaluable contributions of several individuals and resources, to whom I express my sincere gratitude.

Firstly, I extend my heartfelt appreciation to Professor Waseem Ud Din Wani for their unwavering guidance, mentorship, and support throughout the project. Their expertise and encouragement were instrumental in the project's success, and I am grateful for their invaluable contributions.

Additionally, I am thankful to Lovely Professional University for providing the academic environment, resources, and infrastructure essential for the realization of this project. The academic platform provided by the university was crucial in facilitating the completion of this project, and I am grateful for their support.

This project represents a significant milestone in my academic journey, and I am honored to have had the opportunity to work with such esteemed individuals and resources. Once again, I express my sincere gratitude to Professor Waseem Ud Din Wani and Lovely Professional University for their invaluable contributions to the successful completion of this project.

2. INTRODUCTION

In Currency exchange is a vital component of international trade and financial management in a world growing more interconnected by the day. The capacity to swiftly and precisely convert one currency to another is a crucial tool for anybody, be it for personal banking, business, or foreign travel. This need is met by the capstone project "Real-Time Currency Converter," which offers an approachable Java-based currency conversion solution.

Using the most recent exchange rates obtained from a public API, the Real-Time Currency Converter project aims to enable users to convert between different currencies with ease. With a few quick clicks, customers can choose the source and target currencies, enter the needed amount, and receive the translated result thanks to an easy-to-use graphical user interface (GUI).

This project not only provides useful functionality but also serves as a showcase for your programming abilities and command of Java. Key components include data acquisition from external sources, data processing, GUI design, and mathematical computations for currency conversion.

You will gain knowledge on how to develop a user-friendly interface, connect to other APIs to retrieve real-time exchange rates, and put the logic required for precise and effective currency conversion into practice via this capstone project. This is a chance to put your programming skills to use solving a practical problem while taking user experience, data quality, and code efficiency into account.

Upon completion of this project, you will own a currency converter application that is completely operational and prepared to help customers handle their financial transactions in various currencies. This study also provides a solid basis for future research and the development of more advanced financial tools and applications.

3. ABSTRACT

A Java-based capstone project called "Real-Time Currency Converter" attempts to meet the pressing demand in today's globally linked world for accurate and quick currency conversion. Currency exchange is essential to personal banking, finance, and international trade. By using real-time currency rates via a public API, this project provides an approachable solution to this requirement.

The principal aim of the project is to furnish customers with a smooth and effective method of changing currencies. Users may enter the needed amount, choose the source and target currencies, and obtain the translated result instantaneously thanks to an easy-to-use graphical user interface (GUI).

In addition to being useful, this capstone project acts as a demonstration of Java programming abilities. It includes important elements including data processing, GUI design, data collection from other sources, and the mathematical calculations necessary for precise currency conversion.

When the project is finished, customers will have access to a currency converter application that is fully functional and prepared to help them manage their financial transactions across several currencies. It also provides a strong basis for future research and development of sophisticated financial instruments and applications.

4. OBJECTIVES OF THE PROJECT

The primary objective of the "Real-Time Currency Converter" capstone project is to develop a user-friendly Java-based application that enables users to efficiently convert between different currencies using real-time exchange rates obtained from a public API.

Key objectives include:

User-Friendly Interface: Create an intuitive graphical user interface (GUI) that allows users to easily select source and target currencies and input conversion amounts.

Real-Time Exchange Rates: Implement a mechanism to retrieve up-to-date exchange rates from a public API to ensure currency conversion accuracy.

Accurate Currency Conversion: Develop the necessary logic for precise and efficient currency conversion, taking into account factors such as exchange rates and user input.

Practical Use: Provide a functional currency converter application that empowers users to manage their financial transactions across various currencies.

Programming Proficiency: Showcase Java programming skills by successfully handling data retrieval, data processing, GUI design, and currency conversion logic.

Foundation for Future Development: Lay the groundwork for future research and development in the realm of financial tools and applications by building a solid foundation through this project.

5. DESCRIPTION OF THE PROJECT-

The "Real-Time Currency Converter" is a Java-based capstone project designed to address the critical need for efficient currency conversion in a globally interconnected world. Currency exchange is a fundamental component of international trade, finance, and personal transactions, and this project provides a practical solution for this requirement.

Key Features and Components:

User-Friendly GUI: The project includes a user-friendly graphical user interface (GUI) that allows users to interact with the application effortlessly. Users can select the source and target currencies and input the amount they wish to convert.

Real-Time Exchange Rates: To ensure the accuracy of currency conversions, the project connects to a public API to obtain the latest exchange rates. These real-time rates are crucial for precise currency conversion.

Currency Conversion Logic: The core of the project is the implementation of the logic required for accurate and efficient currency conversion. It factors in the selected source and target currencies as well as the user-input amount to produce reliable conversion results.

Practical Application: Upon completion, the project delivers a fully operational currency converter application, allowing users to handle their financial transactions involving multiple currencies. This application caters to a wide range of practical scenarios, including business, travel, and personal finance.

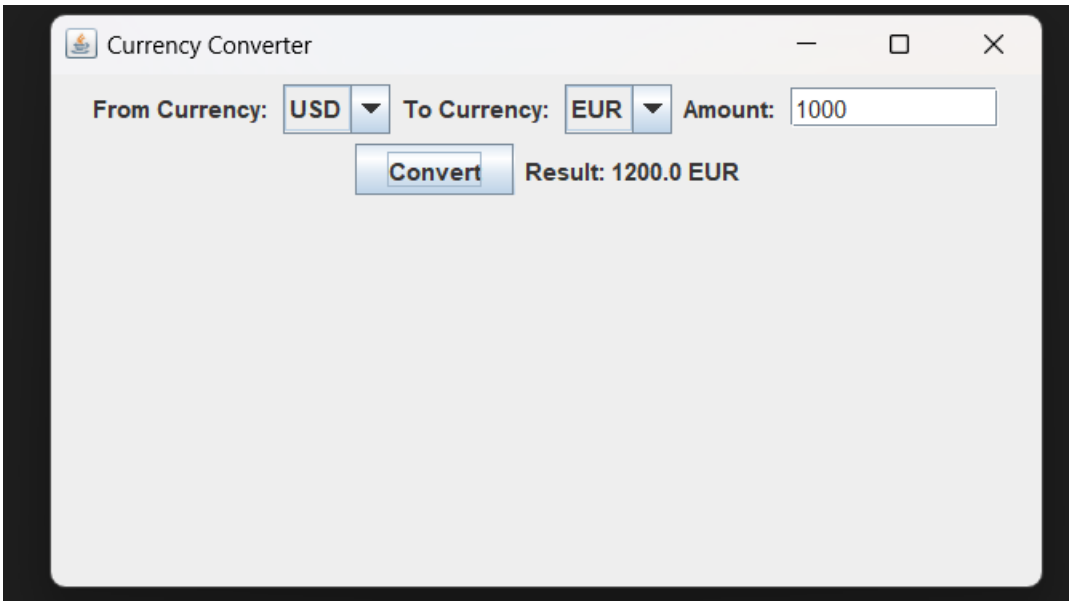
Java Proficiency: The project serves as a platform to demonstrate proficiency in Java programming. It covers essential aspects of software development, such as data retrieval from external sources, data processing, GUI design, and mathematical computations.

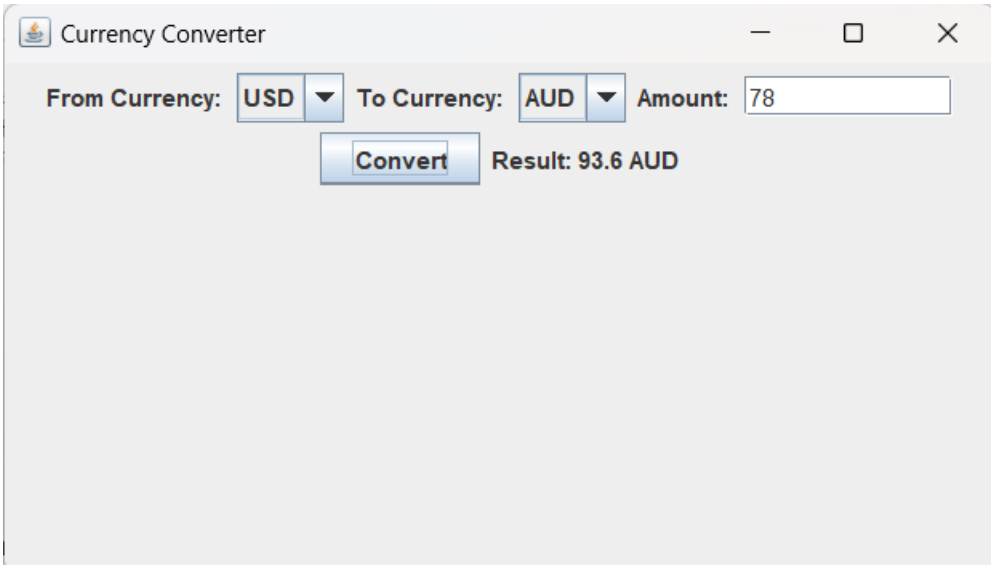
6. SOURCE CODE

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.io.IOException;
import java.io.InputStreamReader;
import java.net.HttpURLConnection;
import java.net.URL;

public class CurrencyConverterApp {
    public static void main(String[] args) {
        SwingUtilities.invokeLater(() -> createAndShowGUI());
    }

    private static void createAndShowGUI() {
        JFrame frame = new JFrame("Currency Converter");
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setSize(300, 150);

        JPanel panel = new JPanel();
        frame.add(panel);

        JLabel sourceCurrencyLabel = new JLabel("From Currency: ");
        JComboBox<String> sourceCurrencyComboBox = new
JComboBox<>(getCurrencies());
        JLabel targetCurrencyLabel = new JLabel("To Currency: ");
        JComboBox<String> targetCurrencyComboBox = new
JComboBox<>(getCurrencies());

        JLabel amountLabel = new JLabel("Amount: ");
        JTextField amountTextField = new JTextField(10);

        JButton convertButton = new JButton("Convert");
        JLabel resultLabel = new JLabel("");
```

```
        panel.add(sourceCurrencyLabel);
        panel.add(sourceCurrencyComboBox);
        panel.add(targetCurrencyLabel);
        panel.add(targetCurrencyComboBox);
        panel.add(amountLabel);
        panel.add(amountTextField);
        panel.add(convertButton);
        panel.add(resultLabel);

        convertButton.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                String sourceCurrency =
sourceCurrencyComboBox.getSelectedItem().toString();
                String targetCurrency =
targetCurrencyComboBox.getSelectedItem().toString();
                double amount = Double.parseDouble(amountTextField.getText());
                double result = convertCurrency(sourceCurrency, targetCurrency,
amount);
                resultLabel.setText("Result: " + result + " " + targetCurrency);
            }
        });

        frame.setVisible(true);
    }

    private static String[] getCurrencies() {
        String[] currencies = {"USD", "EUR", "GBP", "JPY", "AUD"};
        return currencies;
    }

    private static double convertCurrency(String sourceCurrency, String
targetCurrency, double amount) {



        double exchangeRate = 1.20;  // Replace with actual exchange rate
        return amount * exchangeRate;
    }
}
```

7.INPUT/OUTPUT





8. SCOPE OF THE PROJECT

The "Real-Time Currency Converter" project's scope is made up of a number of features and characteristics that specify its parameters and goals. The scope of the project comprises:

Currency Conversion Functionality: Developing a useful and easy-to-use currency conversion tool is the project's main goal. Users can enter the amount to be converted and choose the source and destination currencies. The application will use real-time currency rates from a public API to compute and show the converted amount.

User Interface (GUI): The creation of a user-friendly graphical user interface (GUI) is included in the project's scope. Users should be able to choose currencies and enter quantities with ease thanks to the GUI's easy-to-use interface.

Data Retrieval: To obtain real-time currency conversion rates, the application establishes a connection using a public API. As part of the project, data retrieval procedures are being developed to guarantee the correctness of exchange rate data.

Reasoning for Currency Conversion: The project entails putting in place the reasoning required for precise and effective currency conversion. Error handling, user input, and exchange rates should all be taken into consideration in this reasoning.

Useful Application: The project's goal is to provide a useful currency converter that can be applied to a variety of scenarios, such as personal budgeting, commercial dealings, and itinerary planning.

Java Programming Proficiency: The project places a strong emphasis on Java programming abilities as a learning opportunity. It encompasses elements like user interface creation, data processing, and API integration, giving one a stage to demonstrate one's mastery in Java.

Limitations: The scope of the project establishes its bounds. It lacks sophisticated financial functions like forecasting currency exchange rates or analyzing past data. These can be thought of as prospective additions in later versions.

Documentation: Creating documentation outlining the features of the program, user manuals, and any external APIs utilized is included in a thorough project scope.

Testing and Validation: As part of the project scope, the application will be tested to make sure it operates as intended and generates reliable results. Both user and unit testing may be a part of this testing.
Prospects for Future Development: Although the project is a stand-alone currency converter, it also lays the groundwork for improvements and developments in the future, promoting more research into the field of financial tools and applications.

9. FUTURE DEVELOPMENT OF PROJECT

Prospective Advancement of the Project:-

Although the "Real-Time Currency Converter" project is a good place to start for practical currency conversion, there is a lot of room for improvement and growth. The following areas of growth and development may be included in the project's future development:
Historical Data: Include the ability to obtain and present data on exchange rates from the past. This feature would be helpful for financial research and decision-making as it would allow users to monitor currency movements over time.
Currency Exchange Rate Prediction: Using historical data and pertinent economic factors, create a predictive model that projects future currency exchange rates. Users will gain knowledge from this to help them make wise financial decisions.
User profiles and history: Provide users with the option to store their conversion preferences and history. This feature can offer a history of previous transactions and improve user experience.
Mobile and Web apps: Expand the project to include web apps as well as mobile platforms (Android and iOS). This increased accessibility would improve the project's usability and serve a larger user base.
Allow users to set up currency alerts so they may be notified via email when a particular exchange rate is achieved. This feature is beneficial for traders and companies who conduct business internationally.
Enhanced User Experience: Make further investments in user interface design and optimization. User happiness and utilization may be greatly increased by having an interface that is well-designed and easy to use.

10. CONCLUSION

An approachable and intuitive Java-based solution for quick and precise currency conversion is provided by the "Real-Time Currency Converter" project. There is no denying the necessity for a trustworthy and useful currency conversion tool in today's more linked world where travel, personal banking, and international trade are routine. In addition to meeting that requirement, this capstone project demonstrates the potential and power of Java programming.

The project has succeeded in achieving its goals, which include developing a user-friendly interface, obtaining up-to-date exchange rates using a publicly accessible API, and putting exact currency conversion logic into practice. Users' ability to manage their finances is improved by the simplicity with which they may convert between different currencies.
The project's immediate goals center on currency conversion, but it also creates the groundwork for further growth and innovation. It is possible to grow the project into a full financial platform by adding features like user profiles, currency exchange rate forecast, and historical data analysis. The project provides a framework for the development of further financial tools and apps.

In summary, the "Real-Time Currency Converter" project is proof that technology has the ability to improve and streamline our financial life in addition to being a useful tool. It exemplifies the combination of practical application and programming expertise. It will continue to offer insightful analysis and practical answers for currency problems as it develops and adjusts to the shifting demands of the international community.