Documentation: Password Protected Currency Converter (C++)

1. Introduction

This program is a simple Currency Converter written in C++. It allows the user to convert money from one currency to another. The program is protected by a password so that only authorized users can access it.

2. Features of the Program

1. Password protection with 3 attempts
2. Simple menu-driven program
3. Supports USD, EUR, JPY, and GBP currencies
4. Input validation for amount

3. Password Authentication

Before using the currency converter, the user must enter the correct password (python3.12). The user gets three attempts. If the password is incorrect, the program terminates.

```cpp
#include <iostream>
#include <unordered_map>
#include <string>
#include <algorithm>
#include <limits>
#include <iomanip>
#include <cstdlib>

using namespace std;

bool authenticate() {
    const string correctPassword = "python3.12";
    int attempts = 3;
    string input;

    while (attempts > 0) {
        cout << "Enter password to access the converter (" << attempts << " attempts remaining): ";
        cin >> input;

        if (input == correctPassword) {
            return true;
        } else {
            attempts--;
            cout << "Incorrect password.\n";
        }
    }
    return false;
}
```

4. Currency Data

The program uses two arrays: one for storing currency names and another for storing their exchange rates. The index of the currency array matches the index of the rate array.

```
    string currency[4] = {"USD", "EUR", "JPY", "GBP"};
    double rate[4] = {1.0, 0.85, 110.0, 0.75};

    int choice;

    do
    {
        cout << "\n--- Currency Converter ---\n";
        cout << "1. Show currencies\n";
        cout << "2. Convert currency\n";
        cout << "3. Exit\n";
        cout << "Enter choice: ";
        cin >> choice;

        if (choice == 1)
        {
            cout << "\nAvailable Currencies:\n";
            for (int i = 0; i < 4; i++)
            {
                cout << currency[i] << endl;
            }
        }
        else if (choice == 2)
        {
            string from, to;
            double amount;

            cout << "From currency: ";
            cin >> from;
```

5. Currency Conversion Logic

The conversion formula used in this program is:

*(amount / fromRate) * toRate*

```
            }
            else
            {
                double result = (amount / rate[fromIndex]) * rate[toIndex];
                cout << fixed << setprecision(2);
                cout << amount << " " << from << " = " << result << " " << to << endl;
            }
        }
        else if (choice == 3)
        {
            cout << "Program Exit.\n";
        }
        else
        {
            cout << "Invalid choice!\n";
        }

    } while (choice != 3);

    return 0;
}
```

6. Menu Options

1. Option 1: Displays all available currencies
2. Option 2: Converts currency from one type to another
3. Option 3: Exits the program

7. How to Run the Program

1. Open the file in a C++ compiler.
2. Compile the program.
3. Run the program.
4. Enter the password and follow the menu instructions.

8. Conclusion

This currency converter program is easy to understand and implement. It helps beginners learn basic C++ concepts such as functions, loops, arrays, conditions, and input/output operations.