Coding Exercise

About us

Formedix is a leading supplier of clinical trial automation software and services based on CDISC (Clinical Data Interchange Standards Consortium) standards.

Introduction

The aim of this exercise is to test your programming ability. It is an assignment which has been sent to you before a potential interview, and if you are invited in for an interview we will discuss your solution to the problem.

The solution should be written in Java. Whilst Scala is the primary language used at Formedix, we have found that Java developers with no prior Scala experience can transition to the language fairly easily. The solution should ideally be written in as functional a style as possible.

You are able to use any functionality from the standard libraries in your solution. Whilst it is also permitted to use additional open source libraries, it is preferred to keep these at a minimum, and any use of external libraries must be documented with respect to why they were chosen.

Your solution must be easily compiled and understood by Formedix staff, and preference will be given to well structured and documented code.

Assignment

Data

The European Central Bank publishes historical Euro foreign exchange reference rates in machine readable format @ https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/index.en.html, these are available in CSV format directly @ https://www.ecb.europa.eu/stats/eurofxref/eurofxref-hist.zip.

The structure of this file is in the form:

```
Date,USD,JPY,BGN,CYP,CZK,DKK,EEK,GBP,...
2015-12-31,1.0887,131.07,1.9558,N/A,27.023,7.4626,N/A,0.73395,...
```

Note the use of N/A for currency not in use on the given date.

Exercise

Create an API that loads into memory the aforementioned CSV of historical reference rate data, and provides the following functionality:
- Allows an API caller to retrieve the reference rate data for a given Date for all available Currencies.
- Given a Date, source Currency (eg. JPY), target Currency (eg. GBP), and an Amount, returns the Amount given converted from the first to the second Currency as it would have been on that Date (assuming zero fees).
- Given a start Date, an end Date and a Currency, return the highest reference exchange rate that the Currency achieved for the period.
- Given a start Date, an end Date and a Currency, determine and return the average reference exchange rate of that Currency for the period.

What we're looking for

Primarily, we're looking for neat, well structured and effectively documented code that shows use of some of the core and more recent language capabilities (eg. Interfaces, lambdas, immutable data, iteration/recursion, no side-effects and higher order functional programming). You should be demonstrating your solid understanding of the language constructs, and their use in the problem being solved.

Ideally, we'd also like to see good handling of errors and edge conditions, with evidence of unit testing around the implemented functionality. Feel free to take the opportunity to extend beyond the exercise if you'd really like to show us what you can do.

Submission

Code should be added to a github repository and shared with github users 'rachaelmcmillan' and 'gblincow'. If you have any queries regarding the exercise, please forward these to rachaelmcmillan@formedix.com.