DIN61-222 Adv. Programming (Java)
Semester 1, 2019-2020

Project: A GUI for a Currency Converter

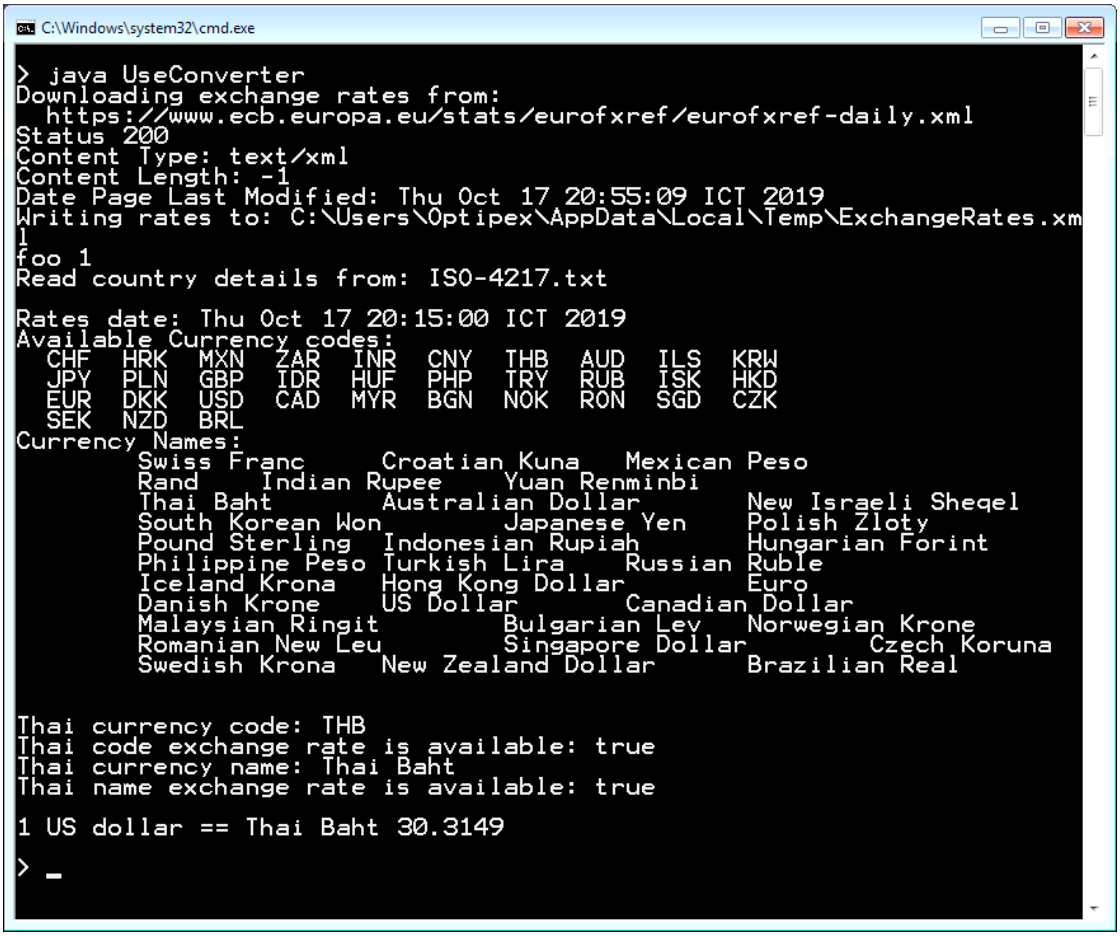
Start Date: Sunday, 20th October, 15:00
Submission Date: Saturday, 2nd November, 13:00 (at the start of class)

Your project is to write a GUI for an existing currency converter program.

The converter class, CurrencyConverter, supports a small API for carrying out currency conversions using exchange rate data downloaded from the European Central Bank website.

The most important CurrencyConverter method is convert() which takes an amount in one currency (e.g. 10.00 US dollars) and returns the equivalent amount in another currency (e.g. 303.1492 Thai Baht).

The UseConverter class demonstrates the various methods offered by CurrencyConverter (see the screenshot below).



You should study UseConverter and the public methods in CurrencyConverter to see how to use CurrencyConverter.

The code for CurrencyConverter can be found at:

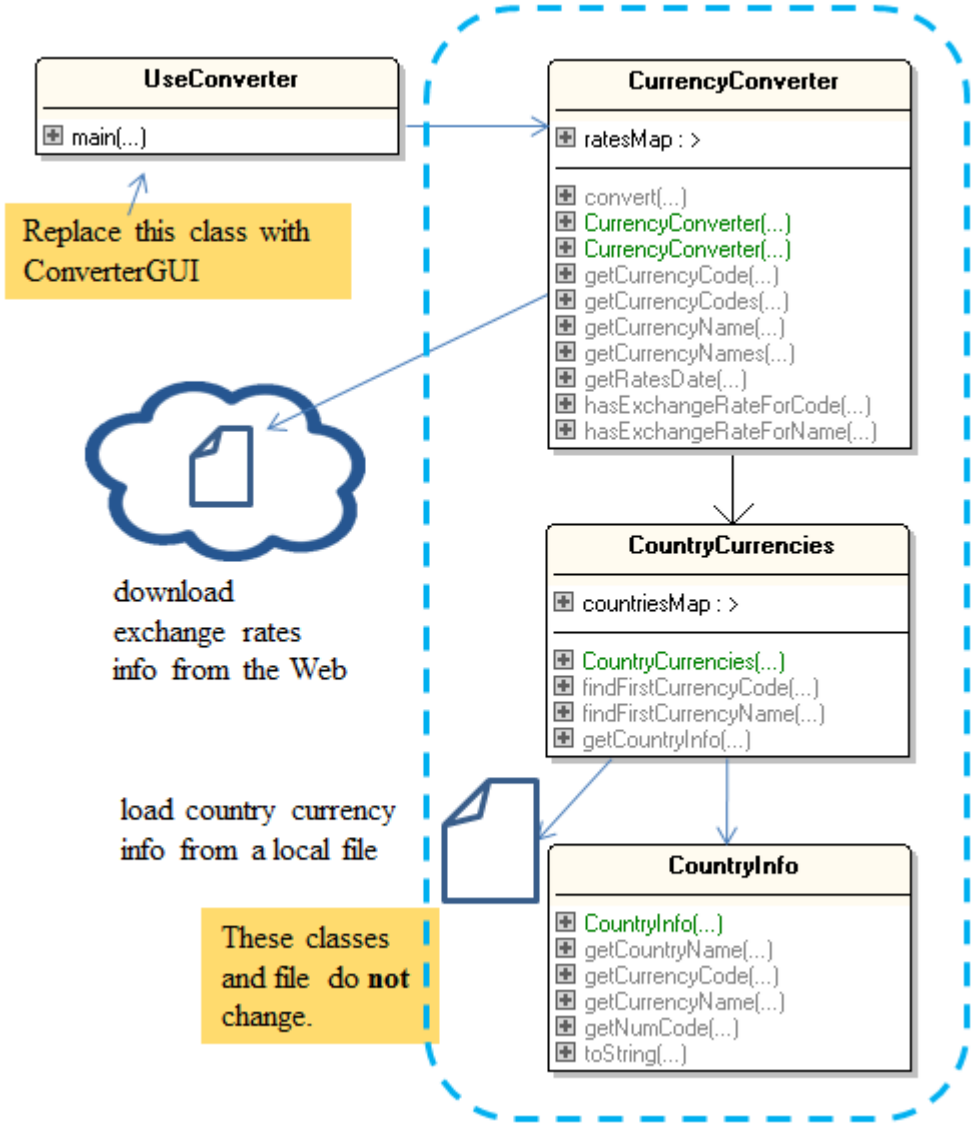
```
http://fivedots.coe.psu.ac.th/~ad/teaching/AP222/
                                Project/CurrencyConverter.zip
```

Download it, unzip it, compile and run it like so:

```
> javac *.java
> java UseConverter
```

CurrencyConverter Overview

UseConverter utilizes the CurrencyConverter class, as illustrated by the augmented class diagrams below:



There is no need for you to understand the detailed workings of CurrencyConverter, CountryCurrencies, or CountryInfo, although you will need to understand how to call CurrencyConverter's public methods.

CurrencyConverter downloads exchange rate information from the Web. Country currencies information is loaded from a local file called ISO-4217.txt.

Your Project

Your project is to replace UseConverter with a GUI for CurrencyConverter, called ConverterGUI. For example, when you type:

```
> java ConverterGUI
```

a window will appear containing various buttons, text fields, etc. by which you select the two currencies involved in the exchange (e.g. from US dollars to Thai Baht), and type in the amount to be changed. The application will then display the changed amount (e.g. 303.1492 Baht).

IMPORTANT: **do not change CurrencyConverter, CountryCurrencies, and CountryInfo in any way**. **Do not modify the country currency information file, ISO-4217.txt.** There is no need to do so, and any changes will result in very large reductions in marks.

If you believe you have found an error in these classes, you should tell Aj. Andrew immediately, and he will investigate.

Hints on GUI Building

My own ConverterGUI class is about 200 lines long, and uses only the Swing features that I have described in the notes. For example, there is no need to use complicated layout managers such as GridBagLayout, or complex components such as JTabbedPane.

The GUI should not read user input from standard input, and should not write to standard output. All user IO should be via the GUI window.

This GUI should be written by you, not by GUI writing software. I can spot the differences easily, and will deduct marks for laziness.

I will be very surprised if two students develop the same (or very similar) GUI. I will take it as a sign of cheating, and will deduct marks.

There are many currency converter programs available on the Web which can give you ideas for your GUI. For example:

But, keep the GUI **SIMPLE**. I do **not** want a 20,000-line mega-program from you, and will become upset if I receive one (and deduct marks).

Submission Details

1. A print-out of all your program files and six pictures should be handed in on Saturday, 2nd November, 13:00 at the start of the class.

   The pages of the print-out should be stapled together at the top-left hand corner. The print-out should **not** include a cover page, or any plastic bindings or envelopes. If possible, print the program two pages to a sheet. The program should be printed in a typewriter-style font, such as "`Courier New`" 10pt size. There must be **no** handwriting on the print-out.

   Stapled to the print-out should be **six pictures**: (1) a *class diagram* like the one in this project description, but showing your ConverterGUI instead of my UseConverter, (2) a *Component Layout Hierarchy* of your GUI (e.g. see Part 14, slide 38), (3) an *event model diagram* (e.g. see Part 12, slide 24), and (4) *three screenshots* of your GUI, showing 3 conversions using different currencies.

   Note: do not hand in print-outs of *my* program files (i.e. CurrencyConverter, CountryCurrencies, and CountryInfo), or the currencies information file, ISO_4217.txt. Only hand in **your** code (i.e. ConverterGUI, and any other classes you have written).

2. Send a **single** e-mail to me at `ad@fivedots.coe.psu.ac.th`. The subject line should be: "`<your student ID>: ConverterGUI`". The body text should be the source code of all your program files only. **Do not use attachments** in your e-mail. **Do not send the six pictures**. The e-mail should arrive before Saturday, 2nd November, 13:00.

3. The program copy handed in must be **identical** to the e-mailed program.

Marks

1. The project is worth **20%** of your total mark, and is to be marked out of 60, including 20 marks for documentation in the source code, 30 marks for the GUI code, and 10 marks for the five pictures.

   Every year students lose many marks because of bad program documentation. I am **very** fussy about good coding style and documentation. Read Part 16 of my notes, "Coding Style", to learn what I want from you.

2. If the program does not compile using Java 11 or later, you will lose half marks.

3. If your project is submitted late, then you will automatically lose half marks, and then a further 10 mark for each hour your project is late.

4. Copied code (i.e. cheating) will be rewarded a **0** mark to everyone involved.

If you have any questions, please come to see me. Good Luck ☺

Andrew Davison
E-mail: `ad@fivedots.coe.psu.ac.th`