

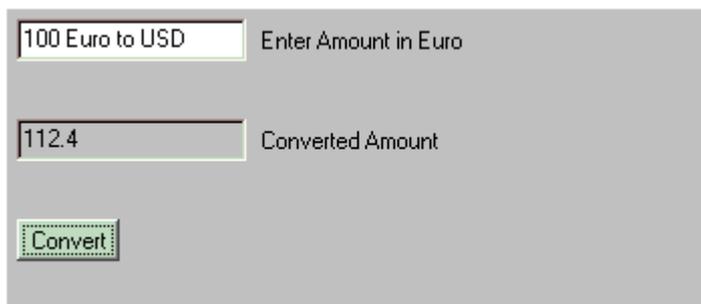
Exercise 4

08.11.2001

Due date: 21.11.2002

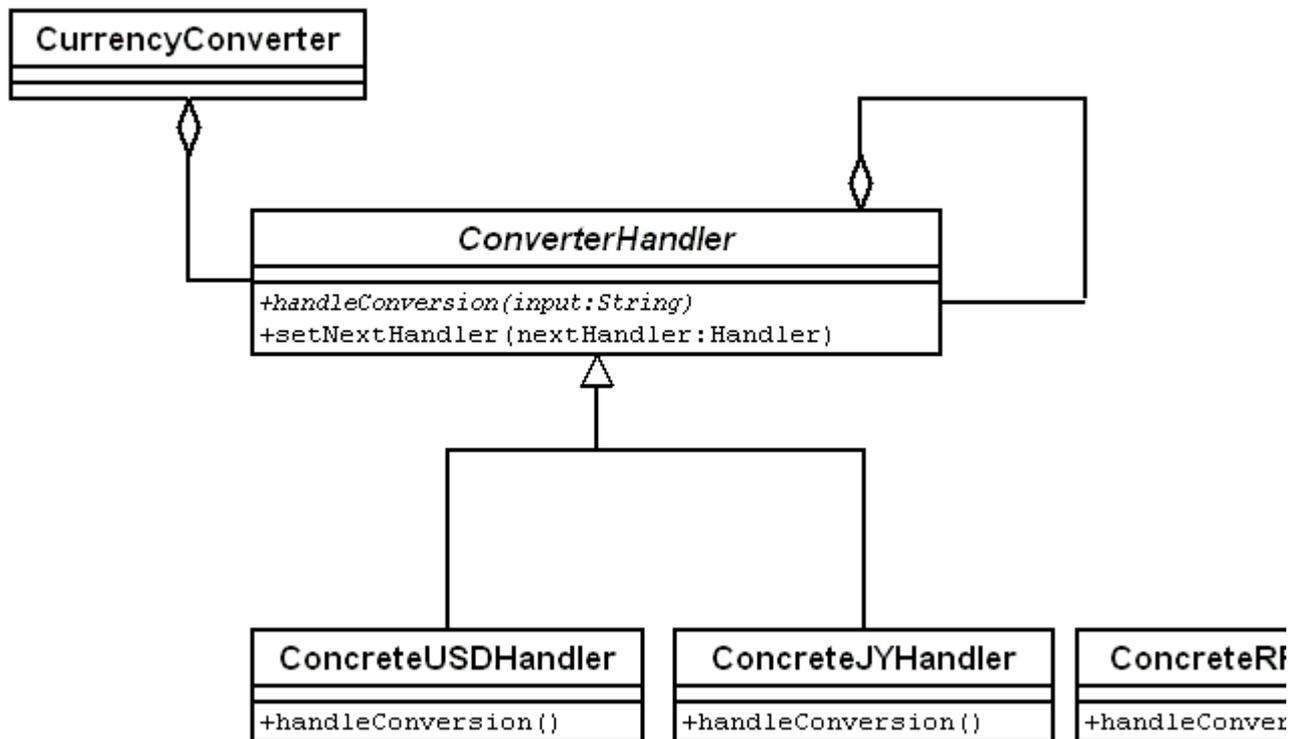
Assignment 4.1

Currency converter: This exercise demonstrates the use of the chain of responsibility design patterns from Gamma's book on a simple version of the currency converter program (CCP). The CCP performs conversion from one of the following three currencies: Euro to USD, RR, JY. Its user interface looks like this:



The screenshot shows a simple graphical user interface for a currency converter. It features a light gray background. At the top, there is a text input field containing the string "100 Euro to USD" and a label "Enter Amount in Euro" to its right. Below this, there is another text input field containing the number "112.4" and a label "Converted Amount" to its right. At the bottom left, there is a button with the text "Convert" inside it.

Chain of Responsibility: The input string specifies the amount to be converted and the currency in which it is expressed (see Figure). The chain of responsibility pattern will be applied to the processing of the input string to generate a double number representing the converted amount. The CCP user interface is seen as a client making a request to convert the input to a national currency. Three handlers are available, one for each national currency. The class diagram for the handlers is:



The chain of responsibility processing therefore produces as an output a double variable representing the converted output in one of the available national currencies.

Assignment 4.2

Currency converter: This exercise demonstrates the use of the decorator design patterns from Gamma's book on a simple version of the currency converter program (CCP). The text appearing in the output field of the CCP UI is a string that has to undergo three decorations:

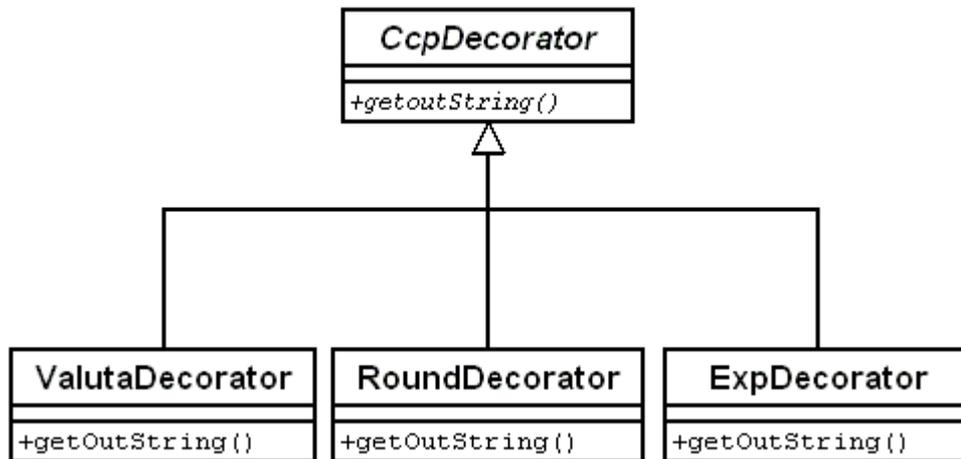
- Add the the national currency name to the converted amount (e.g. ?123.456? to ?123.456 USD?)
- Round output to 2nd decimal (e.g., ?123.456 EUR? ?123.46 USD?)
- Write output in exp. notation (eg ?123.46 USD? ?1.235e2 USD?)

The generic operation to be performed on the output string by the decorators is defined by the following interface:

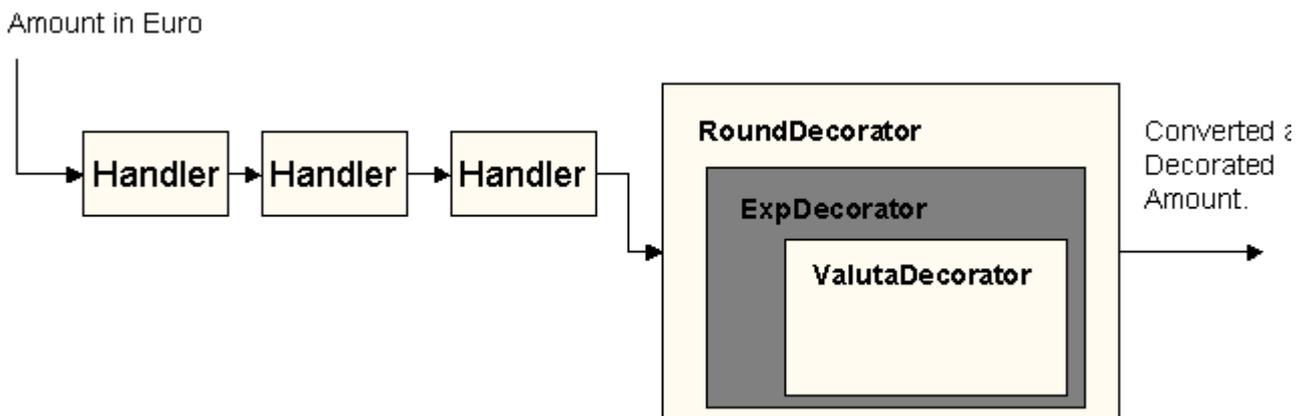
```

interface CcpOutString
{
    String getOutString()
}
  
```

This is the equivalent of the Component class in the decorator pattern as described in Gamma's text and getOutString() is the equivalent of the generic operation operation(). Three concrete decorators will be used for the CCP:



The resulting processing flow for the CCP application is shown schematically in the next figure:



The chain of responsibility processing therefore produces as an output a double variable representing the converted output in one of the available national currencies.

Enter Amount in Euro

Converted Amount