

GO FOR THE MONEY! JSR-354

A QUICK INTRODUCTION TO THE JAVA MONEY AND CURRENCY API

Marcus Fihlon

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Scrum Master | Software Engineer | Lecturer | Speaker

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Or you can focus on the presentation and live coding.

All my slides and source files are available online.

A link and a QR code are on the last slide.

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www.fihlon.ch | github.com/McPringle | hackergarten.net

AGENDA

Intro

API

Code

Wrap-up

INTRO

A large proportion of the computers in this world manipulate money, so it's always puzzled me that money isn't actually a first class data type in any mainstream programming language. The lack of a type causes problems, the most obvious surrounding currencies...

Martin Fowler

- `float, double` (since Java 1)
- `java.math.BigDecimal` (since Java 1.1)
- `java.text.DecimalFormat` (since Java 1.1)
- `java.util.Currency` (since Java 1.4)

- Monetary values are a key feature for many applications
- `java.util.Currency` is a structure for ISO-4217 only
- No standard value type to represent a monetary amount
- No support for currency arithmetic or conversion
- No support for historic or virtual currencies
- `java.text.DecimalFormat` lacks flexibility

REQUIREMENTS

- Easy **addition** and **modification** of currencies
- Currencies need a **context** and should be **client-aware**
- Standard API for **money amounts, rounding, conversions**
- Easy, flexible, complex, individual **formatting** and **parsing**
- Clearly defined **extension points**
- Follow the **design principles** of the Java platform
- Compatibility with **Standard Edition** and **Micro Edition**
- No external **dependencies**
- **Interoperability** with existing artifacts
- Support **functional** programming style

- JSR-354 started early 2012
- JSR-354 early draft review in 2013
- Reference implementation started late 2013
- Final release of JSR-354 early 2015
- Final release of reference implementation early 2015

API

■ Monetary

- Get a currency by code or locale
- Additional API for complex queries
- Supports SPI to enhance functionality

■ CurrencyUnit

- Currency code (string and number)
- Additional context information (e.g. type, capabilities)

■ CurrencyQueryBuilder

- Builder for complex queries for accessing currency units

■ Monetary

- Get a monetary amount by currency and value
- Optionally specify an explicit factory
- Or query for a suitable factory
- Supports SPI to enhance functionality

■ MonetaryAmount

- Numeric value and currency
- Arithmetic operations to do calculations
- Multiple implementations
- Interoperability rules
- Additional context information (e.g. capabilities)

■ MonetaryAmountFactoryQueryBuilder

- Builder for complex queries for accessing monetary amount factories

■ Monetary

- Get a rounding operator
- Optionally specify a locale
- Or query for a suitable rounding operator
- Supports SPI to enhance functionality

■ MonetaryRounding

- Extends **MonetaryOperator**
- Multiple implementations
- Additional context information

■ RoundingQueryBuilder

- Builder for complex queries for accessing rounding operators

■ `MonetaryConversions`

- Get a currency conversion by currency code or unit
- Or query for a suitable currency conversion
- Supports SPI to enhance functionality

■ `CurrencyConversion`

- Multiple implementations
- Source and target currency
- Conversion factor
- Additional context information
- Unidirectional

■ `ConversionQueryBuilder`

- Builder for complex queries for accessing currency conversions

■ `MonetaryConversions`

- Get an exchange rate provider
- Or query for a suitable currency conversion
- Supports SPI to enhance functionality

■ `ExchangeRateProvider` → `ExchangeRate`

- Multiple implementations
- Source and target currency
- Conversion factor
- Additional context information
- Unidirectional

■ `ConversionQueryBuilder`

- Builder for complex queries for accessing exchange rate providers

■ `MonetaryFormats`

- Get a monetary amount format
- Optionally specify a locale
- Or query for a suitable monetary amount format
- Supports SPI to enhance functionality

■ `MonetaryAmountFormat`

- Multiple implementations
- Additional context information
- Format monetary amounts
- Parse monetary amounts

■ `AmountFormatQueryBuilder`

- Builder for complex queries for accessing monetary amount formats

CODE



Code

Demo Application Walkthrough

WRAP-UP

Money Validation by Zalando

- Validate monetary amounts
- Uses existing, standardized constraints
- Offers additional, more expressive custom constraints
- Can be use with any Bean Validation implementation

```
1 @Min  
2 @Max  
3 @DecimalMin  
4 @DecimalMax  
5 @Positive  
6 @PositiveOrZero  
7 @Negative  
8 @NegativeOrZero  
9 @Zero
```

- Supports
 - Java Micro Edition
 - Java Standard Edition
 - Java Enterprise Edition
- Compatible with Java 8+
- Backport available for Java 7

pom.xml

```
1 <dependency>
2   <groupId>javax.money</groupId>
3   <artifactId>money-api</artifactId>
4   <version>1.0.1</version>
5 </dependency>
6 <dependency>
7   <groupId>org.javamoney</groupId>
8   <artifactId>moneta</artifactId>
9   <version>1.1</version>
10 </dependency>
```


build.gradle

```
1 compile(  
2     'javax.money:money-api:1.0.1',  
3     'org.javamoney:moneta:1.1'  
4 )
```

- Java Money Umbrella Site
<http://javamoney.org/>
- JSR-354 Specification
<http://javamoney.github.io/api.html>
- JSR-354 Reference Implementation
<http://javamoney.github.io/ri.html>
- JSR-354 Technical Compatibility Kit
<http://javamoney.github.io/tck.html>
- Java Money Financial Library
<http://javamoney.github.io/lib.html>
- Money Validation
<https://github.com/zalando/money-validation>

Thank You! Questions?



<http://bit.ly/jsr-354>