

Extending enums

Improvements in the Rune DSL

15 October 2024

Example: Currency Codes

```
enum ISOCurrencyCodeEnum:
```

```
    AFN <"Afghani">
```

```
    EUR <"Euro">
```

```
    GBP <"Pound Sterling">
```

```
    USD <"US Dollar">
```

```
    ...
```

```
enum CurrencyCodeEnum extends ISOCurrencyCodeEnum:
```

```
    CNH <"Offshore Chinese Yuan traded in Hong Kong.">
```

```
    JEP <"Jersey Pound.">
```

```
    KID <"Tuvaluan Dollar.">
```

```
    VAL <"Vatican Lira.">
```

```
    ...
```

Problem: limited support

```
enum ISOCurrencyCodeEnum:
```

```
  AFN <"Afghani">
```

```
  EUR <"Euro">
```

```
  GBP <"Pound Sterling">
```

```
  USD <"US Dollar">
```

```
  ...
```

```
enum CurrencyCodeEnum extends ISOCurrencyCodeEnum:
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```

```
  VAL <"Vatican Lira.">
```

```
  ...
```

- Comparing an ISO currency code to an extended currency code does not work.

```
if isoCurrencyCode = currencyCode
then ...
```

- No support for joining multiple enums.

```
enum FloatingRateIndexEnum:
```

```
  ...
```

```
enum InflationRateIndexEnum:
```

```
  ...
```

```
enum RateIndexEnum extends FloatingRateIndexEnum, InflationRateIndexEnum:
  // Merge of `FloatingRateIndexEnum` and `InflationRateIndexEnum`
```

- Non-standard: no other language supports extending enums.

Proposed solution: choice types

Solution already exists!

```
enum ISOCurrencyCodeEnum:
```

```
  AFN <"Afghani">
```

```
  EUR <"Euro">
```

```
  GBP <"Pound Sterling">
```

```
  USD <"US Dollar">
```

```
  ...
```

```
enum NonISOCurrencyCodeEnum:
```

```
  CNH <"Offshore Chinese Yuan traded in Hong Kong.">
```

```
  JEP <"Jersey Pound.">
```

```
  KID <"Tuvaluan Dollar.">
```

```
  VAL <"Vatican Lira.">
```

```
  ...
```

```
choice CurrencyCode:
```

```
  ISOCurrencyCodeEnum
```

```
  NonISOCurrencyCodeEnum
```

- Comparing an ISO currency code to a currency code works!

```
if isoCurrencyCode = currencyCode  
then ...
```

- Out-of-the-box support for joining multiple enums.

```
enum FloatingRateIndexEnum:
```

```
  ...
```

```
enum InflationRateIndexEnum:
```

```
  ...
```

```
choice RateIndexEnum:
```

```
  FloatingRateIndexEnum
```

```
  InflationRateIndexEnum:
```

- Proven solution by other languages.

Proposed solution: choice types

DSL work required

Step 1

- Deprecate enum extensions, while keeping support.
- Enhance DSL support for choice types.
- Enhance usage of enum choice types in expressions (switch, implicit enum types, ...).

At this point, models are ready to be migrated over.

Step 2 (for a future major dev version)

- Remove support for deprecated syntax.

Note that this is a backwards incompatible change.

Proposed solution: choice types

Impact analysis

Common Domain Model (6-dev)

- `enum` AssetIdTypeEnum `extends` ProductIdTypeEnum
- `enum` CurrencyCodeEnum `extends` ISOCurrencyCodeEnum
- `enum` WeeklyRollConventionEnum `extends` DayOfWeekEnum
- `enum` OptionTypeEnum `extends` PutCallEnum

Digital Regulatory Reporting (5-prod)

- `enum` CommodityTimeUnitEnum `extends` TimeUnitEnum

ISDA Foundations (3-dev)

None