UnitParser (Java)

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Last release -- Test program

Main page (versión en español)

Introduction

The main class is called *UnitP* (*UnitParser* package). It can be instantiated in many different ways.

```
//1 N.
UnitP unitP = new UnitP("1 N");

//1 N.
unitP = new UnitP(1.0, UnitSymbols.Newton);

//1 N.
unitP = new UnitP(1.0, "nEwTon");

//1 N.
unitP = new UnitP(1.0, Units.Newton);
```

UnitP can be seen as an abstract concept including many specific types (full list). Same-type variables can be added/subtracted. Different-type variables can be multiplied/divided, but only in case of generating a valid-type output.

```
//2 N.
unitP = UnitP.Addition(new UnitP("1 N"), new UnitP(1.0, Units.Newton));

//1 J.
unitP = UnitP.Multiplication(new UnitP("1 N"), new UnitP("1 m"));

//Error not triggering an exception.
//The output unit N*m^2 doesn't match any supported type.
unitP = UnitP.Multiplication
(
        UnitP.Multiplication
        (
                new UnitP("1 N"), new UnitP("1 m")
        ),
        new UnitP("1 m")
);
```

Main Variable Information

UnitP variables are defined according to various *final* fields populated at instantiation.

Unit - Corresponding Units member.
UnitType - Corresponding UnitTypes member.

UnitSystem - Corresponding UnitSystems member.
UnitParts - Defining parts of the given unit.
UnitPrefix - Supported prefix affecting all the unit parts.
BaseTenExponent - Base-ten exponent used when dealing with too small/big values.
Error - Variable storing all the error- and exception-related information.

General Rules

All the functionalities are based upon the following ideas:

- In case of incompatibility, the first element is always preferred.
- By default, the formally-correct alternative is preferred. Some required modifications might be performed.
- By default, all the errors are managed internally.

```
//1.3048.
unitP = UnitP.Addition(new UnitP("1 m"), new UnitP("1 ft"));

//Error not triggering an exception.
//The parser expects "km" or a full-name-based version like "KiLom".
unitP = new UnitP("1 Km");

//999999.9999999001*10^19 YSt.
unitP = UnitP.Multiplication
(
        999999999999999999999999999999999999.9,
        new UnitP("9999999999999 St")
);
```

Unit String Parsing Format

The unit string parsing part is quite flexible, but there are some basic rules.

- String multi-part units are expected to be exclusively formed by units, multiplication/division signs and *integer* exponents.
- Only one division sign is expected. The parser understands that all what lies before/after it is the numerator/denominator.

```
//1 W.
unitP = new UnitP("1 J*J/s*J2*J-1*s*s-1");

//Error not triggering an exception.
//The parser understands "J*J/(s*J2*s*J*s)", what doesn't represent a
supported type.
unitP = new UnitP("1 J*J/(s*J2*s)*J*s");
```

Numeric Support

Formally, only the *double* type is supported. Practically, *UnitP* variables implement a mixed system delivering beyond-*double*-range support.

```
//7.891011 ft.
unitP = UnitP.Multiplication(new UnitP("1 ft"), 7.891011);

//1.213141516 Gs.
unitP = UnitP.Multiplication(new UnitP("1 s"), 1213141516.0);

//0.0003094346047382587*10^-752 ym.
unitP = UnitP.Division
(
        UnitP.Division
        (
                UnitP.Division
                (
                        UnitP.Multiplication
                        (
        0.000000000000000000000000000000000000000000000001,
                                new UnitP(0.000000000000000000001, "ym2")
                        ),
                        new UnitP("999999999999999999999 Ym")
                ),
                Double.MAX_VALUE
        ),
        Double.MAX_VALUE
);
```

Further Code Samples

The test application includes a relevant number of descriptive code samples.

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