Principles of Object Oriented Programming

Exercise 2

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1. **Components:**

i. Scalar:

"Scalar" is an interface. The classes "RationalScalar" and "RealScalar" extends it. Both classes are logically counts as scalars and therefore have the same functions, although the functions implement differently in each class.

ii. Rational scalar:

"RationalScalar" is a class extends the scalar interface. This class represent a number from the 'Q' field, and therefore this class supports functions the can be applied on rational scalar.

iii. Real scalar:

"RealScalar" is a class extends the scalar interface. This class represent a number from the 'R' field, and therefore this class supports functions the can be applied on real scalar.

iv. Poly term:

"Polyterm" is a class contains both "Scalar" and an exponent and represents one element from a specific polynom. For example if the polynom is: "3x^2+4x" then it contains 2 poly terms: "3x^2" and "4x". This class supports adding multiplying etc. between 2 polyterms.

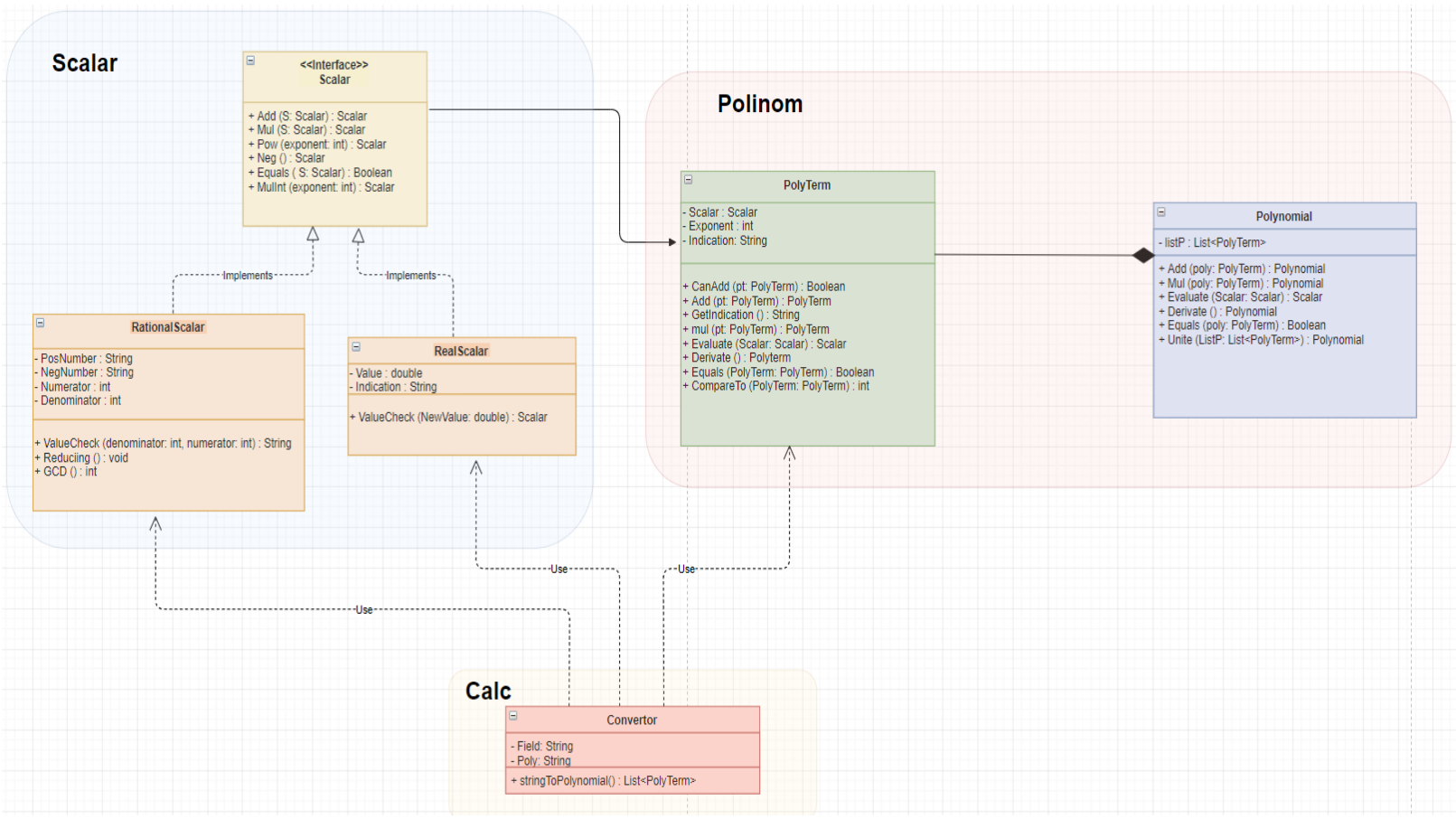
v. Polinomial:

"Polinomial" is a collection of poly terms, represents a Polynom. This class supports adding, multiplying between 2 polynoms, evaluating a scalar and derivative.

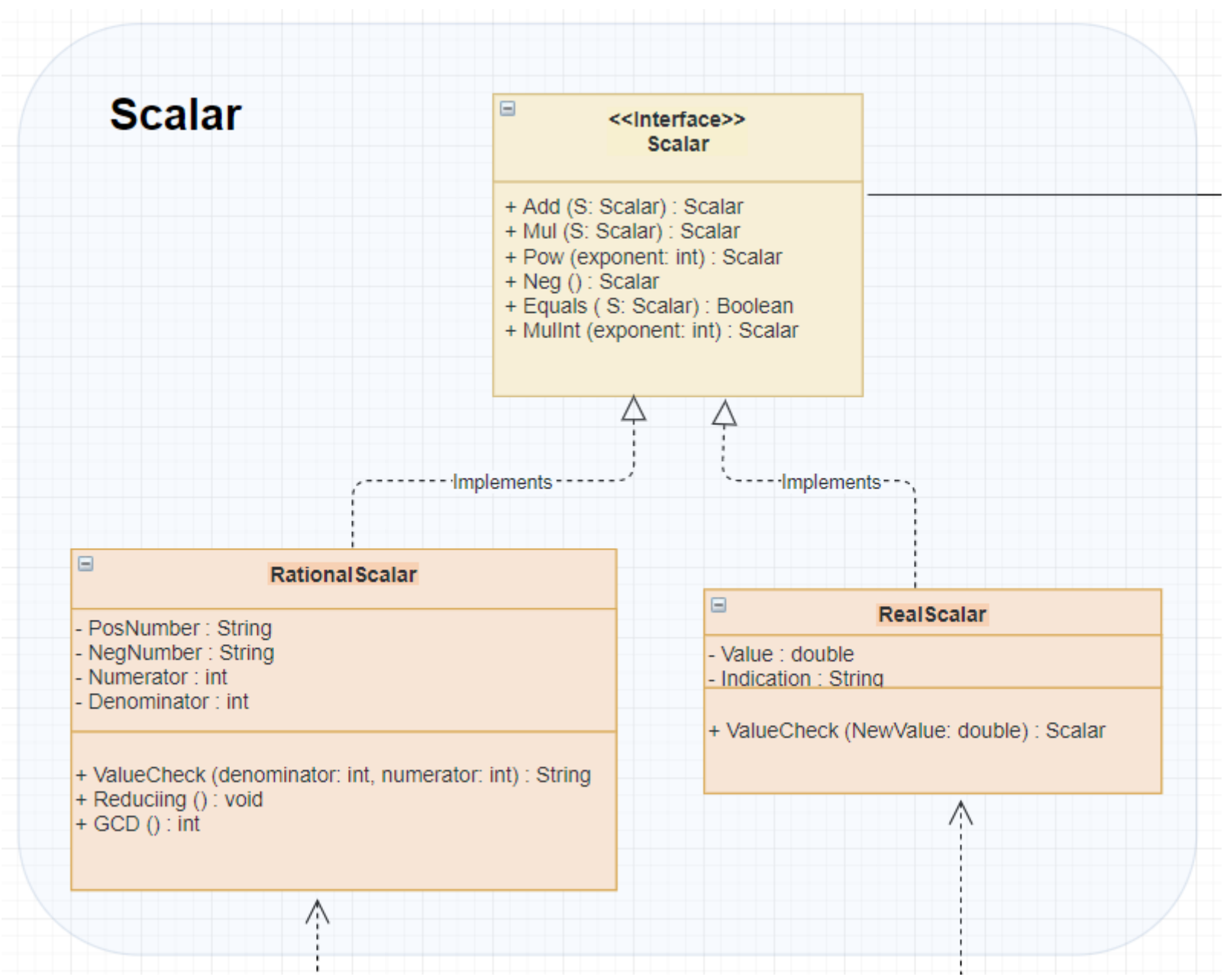
vi. Calculator:

The main program. The user choose in which field to work, either Q or R, then choose the operation to do, and then write either one or two polynoms in in accordance with the operation. The user the gets the answer and can decide if the preform another operation or exit the program.

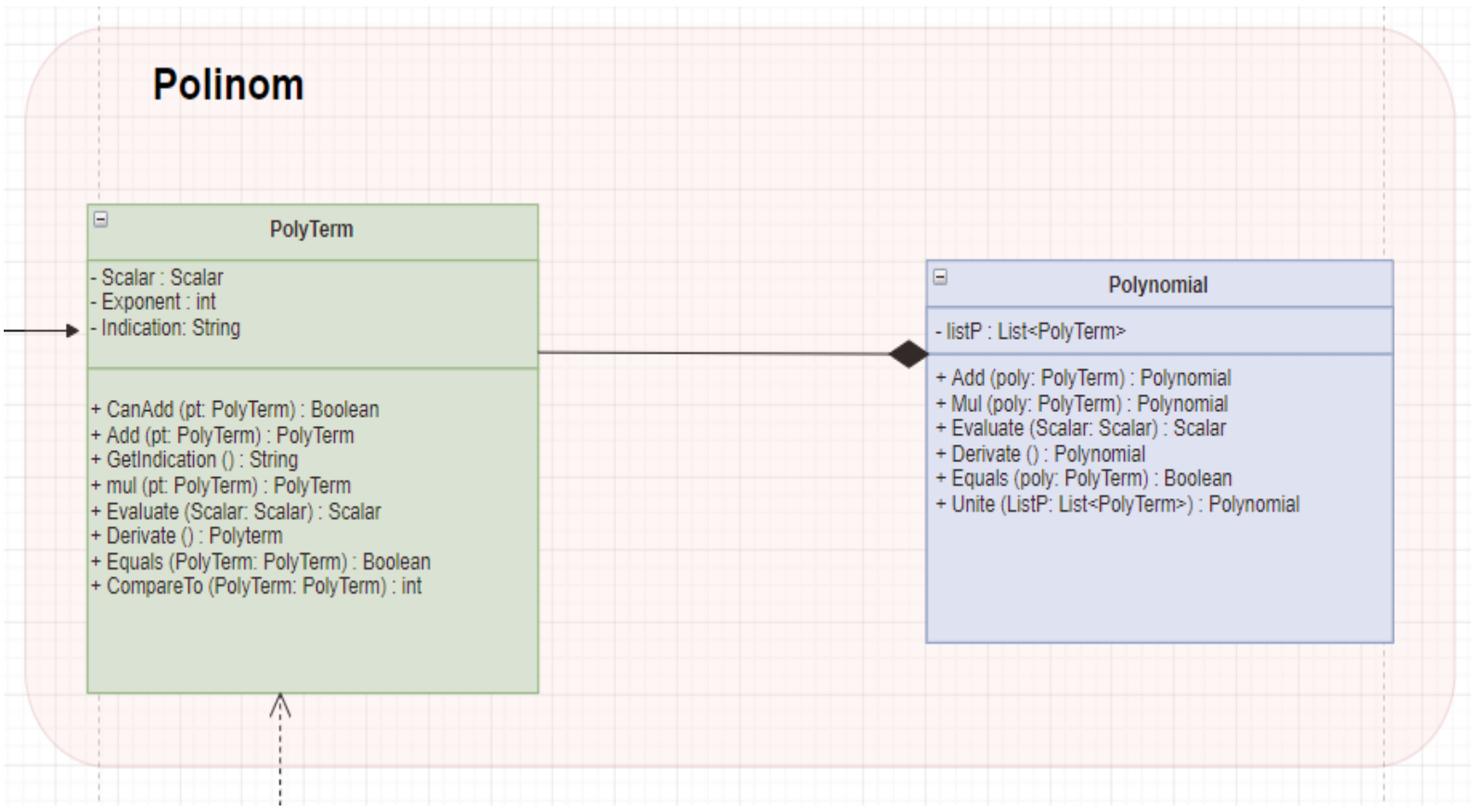
2. UML Diagram:



Scalar :



Polinom:



Calculator: