Define the components and their responsibilities:

Scalar – An interface of numbers.

RealScalar – this class Implements the interface of Scalar and his methods, represents a real number and will be printed up to 3 digits after the decimal point, represented by double.

RationalScalar – this class Implements the interface of Scalar and his methods, should be represented by 2 Integers in the form of a/b.

PolyTerm - This class represents a polynomial term, a term is represented by a coefficient (Scalar) and an exponent (nonnegative integer).

Polynomial - This class represents a polynomial, a polynomial is represented by list of PolyTerms, and will be printed as a friendly representation of the object.

Calculator – This class has the main method and she is the connection between the software and the user.

The next classes used in the project :

1)List – an interface

2)Link – a link that has 2 fields, one of data and the other is a reference for the next link.

3)Linked List – implements the interface of list and his methods, has a field of the first link in the list.

4)Linked List Iterator – help us to go throw the list for few methods.

Polynomial Calculator

Polynomial

- PolyList:List<PolyTerm>
- field:String

- findIndexToAdd(PolyTerm,List<PolyTerm>):int
- addExponent(List<PolyTerm>,PolyTerm)
+ add(Polynomial):Polynomial
+ mul(Polynomial):Polynomial
+ eveluate(Scalar):Scalar
+ derivate():Polynomial
+ equals(Polynomial):boolean
+ toString():String

PolyTerm

- coefficient:Scalar
- exponent:Integer

+ GetCoefficient():Scalar
+ GetExponent():Integer
+ SetCoefficient(Scalar)
+ canAdd(PolyTerm):boolean
+ add(PolyTerm):PolyTerm
+ mul(PolyTerm):PolyTerm
+ eveluate(Scalar):Scalar
+ derivate():PolyTerm
+ equals(PolyTerm):boolean
+ toString():String

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RealScalar

- a:double

+ getValue():double
- reduce(String):String
+ derivateMul(int):RealScalar

RationalScalar

- a:int
- b:int

+ geta():int
+ getb():int
- division(int,int):Scalar
+ derivateMul(int):RationalScalar

<<Interface>>
Scalar

+ add(Scalar):Scalar
+ mul(Scalar):Scalar
+ pow(int):Scalar
+ neg():Scalar
+ equals(Scalar):boolean
+ emptyScalar():Scalar
+ toString():String