Principles of Object Oriented Programming – Assignment 2

Scalar- this is a interface that includes the methods:

-add

-mul

-neg()

-inv()

-isZero

Both Rational and Complex classes implements this class.

Rational-this class implements the interface-Scalar.

It represents a rational number in the form of a/b, where a and b are two Integers.

Complex-this class implements the interface-Scalar.

It represents a complex number in the form of a+bi, where a and b are two rational numbers. a is the real part, b is the imaginary part.

MathVector- This class represents a mathematical vector of Scalars, this class is implemented by an array of Scalars.

It represents a row in the matrix.

Matrix- This class represents a matrix of size m × n, this class is implemented by a Vector of MathVectors. Its main methods are add, multiply and solver linear equations.

UI- This is an interface which represents the User interface. It includes the play() operation which starts the program.

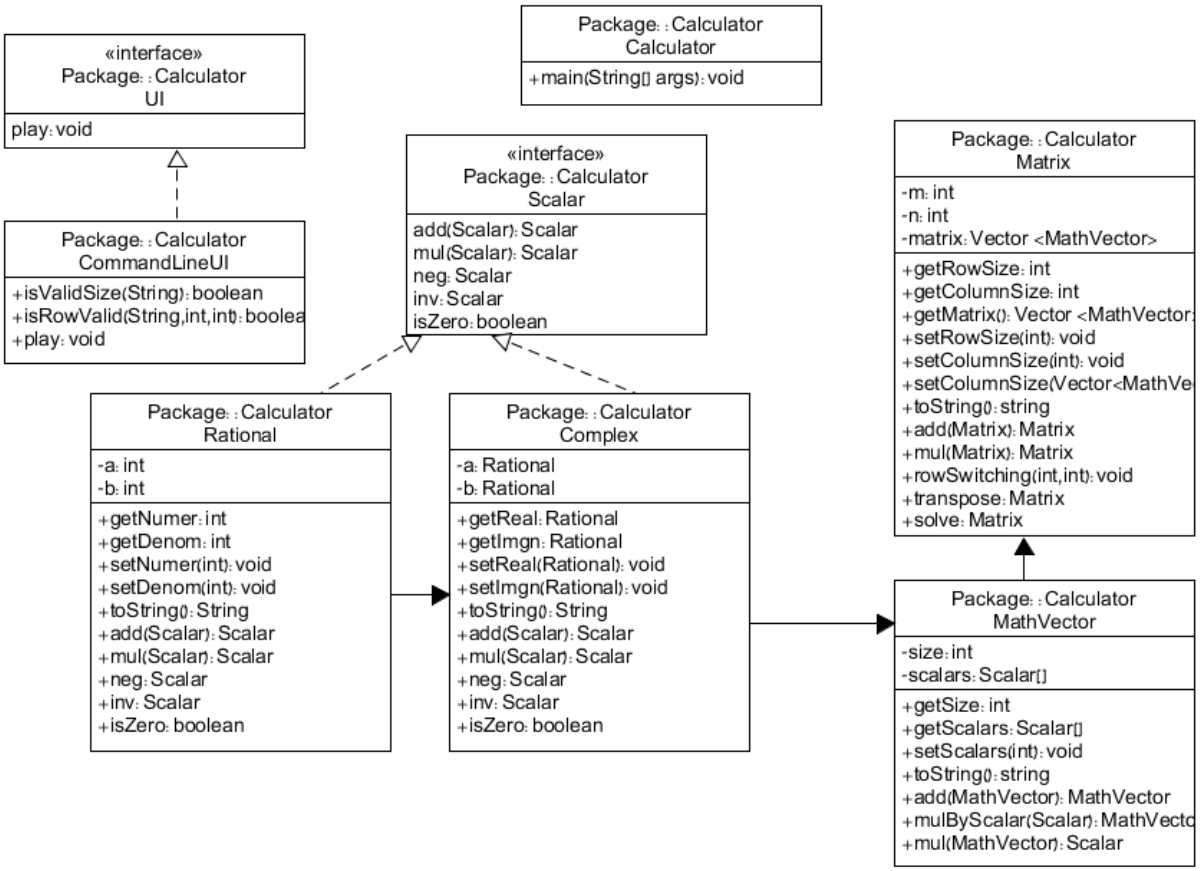
CommandLineUI- This class implements the interface UI.

In this class we show the menu and we get the matrix from the user and print the solution(add,mul,solve)for the matrix

To the screen.

Calculator- This class includes the main method which invokes the play() method in the UI class.

The uml:


«interface»
Package: : Calculator
UI
play: void
Package: : Calculator
Calculator
+main(String[] args): void
«interface»
Package: : Calculator
Scalar
add(Scalar): Scalar
mul(Scalar): Scalar
neg: Scalar
inv: Scalar
isZero: boolean
Package: : Calculator
Matrix
-m: int
-n: int
-matrix: Vector <MathVector>
+getRowSize: int
+getColumnSize: int
+getMatrix(): Vector <MathVector
+setRowSize(int): void
+setColumnSize(int): void
+setColumnSize(Vector<MathVe
+toString(): string
+add(Matrix): Matrix
+mul(Matrix): Matrix
+rowSwitching(int,int): void
+transpose: Matrix
+solve: Matrix
Package: : Calculator
CommandLineUI
+isValidSize(String): boolean
+isRowValid(String,int,int): boolea
+play: void
Package: : Calculator
Rational
-a: int
-b: int
+getNumer: int
+getDenom: int
+setNumer(int): void
+setDenom(int): void
+toString(): String
+add(Scalar): Scalar
+mul(Scalar): Scalar
+neg: Scalar
+inv: Scalar
+isZero: boolean
Package: : Calculator
Complex
-a: Rational
-b: Rational
+getReal: Rational
+getImgn: Rational
+setReal(Rational): void
+setImgn(Rational): void
+toString(): String
+add(Scalar): Scalar
+mul(Scalar): Scalar
+neg: Scalar
+inv: Scalar
+isZero: boolean
Package: : Calculator
MathVector
-size: int
-scalars: Scalar[]
+getSize: int
+getScalars: Scalar[]
+setScalars(int): void
+toString(): string
+add(MathVector): MathVector
+mulByScalar(Scalar): MathVecto
+mul(MathVector): Scalar