**Spring – 2019 CS-111 Lab Assignment 2 Points Possible: 100**

TOPICS: Writing classes, containment

In this assignment you will implement a “MixedNumber” class along with some basic arithmetic operations for objects of this type. This class illustrates the concept of “containment”. This is a type of association between classes where one class contains an instance of another.

**MixedNumber**

**- wholeNumber: int**

**- fractionPart: Fraction**

**+MixedNumber( int whole, Fraction fract)**

**+MixedNumber( Fraction fract)**

**+ add( MixedNumber other) : MixedNumber**

**+ add( Fraction fract) : MixedNumber**

**+ subtract( MixedNumber other) : MixedNumber**

**+ subtract( Fraction fract) : MixedNumber**

**+ multiply( MixedNumber other) : MixedNumber**

**+ multiply( Fraction fract) : MixedNumber**

**+ divide ( MixedNumber other) : MixedNumber**

**+ divide ( Fraction fract) : MixedNumber**

**+ simplify() :void**

**+toString() : String**

**+ equals( MixedNumber other) : Boolean**

**+ convertToFraction() : Fraction**

**+ convertToDecimal() : double**

* public MixedNumber( int whole, Fraction fract) : This constructor receives both a whole number and a fraction that will be stored into a new instance of Mixed Number. After storing the parameters into the data members it should call method simplify, in case the user provides an improper fraction
* public MixedNumber( Fraction fract): This constructor creates a MixedNumber from a fraction. The data member wholePart should be set to zero, and the parameter stored into the fractionPart data member. Then simplify should be called in case the user provides an improper fraction.
* public MixedNumber add( MixedNumber other) : This method adds together two mixed numbers ( this + other) and produces a new MixedNumber as a result
* public MixedNumber add( Fraction fract): This method adds a Fraction to a MixedNumber and produces a new MixedNumber as a result
* public MixedNumber subtract( MixedNumber other) : This method subtracts one mixed number from another (this – other) and produces a new MixedNumber
* public MixedNumber subtract( Fraction fract) : This method subtracts a Fraction from a MixedNumber and produces a new MixedNumber
* public MixedNumber multiply( MixedNumber other) : This method multiplies two MixedNumbers
* (this \* other) and produces a new MixedNumber
* public MixedNumber multiply( Fraction fract) : This method multiplies a MixedNumber by a Fraction and produces a new MixedNumber
* public MixedNumber divide ( MixedNumber other) : This method divides one MixedNumber by another (this / other) and produces a new MixedNumber
* public MixedNumber divide ( Fraction fract) : This method divides a MixedNumer by a Fraction and produces a new MixedNumber
* public void simplify() : If the fractionPart of a MixedNumber is improper, this method will simplify the fractionPart to modify the MixedNumber

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* public String toString() : returns a string containing the contents of a MixedNumber object in the format:

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* public boolean equals( MixedNumber other) : This method compares two MixedNumbers for equality.
* public Fraction convertToFraction() : This method converts a MixedNumber into a Fraction
* public double convertToDecimal() : This method converts a MixedNumber into a decimal

You need to create a package named *MixedNumber* with 3 classes:  FractionException, Fraction, WholeNumber.

Fraction contains 2 data members.. 1 is an integer and the other a Fraction