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Class and Section CS-210-02

Total Points (40 pts) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Due: Refer to Blackboard (Late homework submission is not acceptable! You must turn in your own work in blackboard!)**

**Project: Project: Proper Fractions, Improper Fractions, and Mixed Fractions**

CS210 Introduction to Programming Principles

California Lutheran University

Problem Description:

Proper fractions, improper fractions, and mixed fractions are defined at: <http://www.ltcconline.net/greenl/courses/187/b/impropermixed.htm>.

Write a program that prompts the user to enter the numerator and denominator of a fraction number and determines whether it is a proper fraction and improper fraction. For an improper fraction number, display its mixed fraction in the form of a + b / c if b % c is not zero; otherwise, display only the integer.

Here are sample runs of the program (Show different test cases for your own solution):

Sample 1:

Enter a numerator: 16

Enter a denominator: 3

16 / 3 is an improper fraction and its mixed fraction is 5 + 1 / 3.

Sample 2:

Enter a numerator: 6

Enter a denominator: 7

6 / 7 is a proper fraction

Sample 3:

Enter a numerator: 6

Enter a denominator: 2

6 / 2 is an improper fraction and it can be reduced to 3

Submit the following items:

1. Submit this world document with your answers before the due date.
2. Zip your project and submit it before the due data.
3. Analysis: (10 pts)

(Describe the program use cases. Write down the requirements for your code. Describe the stakeholders for your code. Describe what the SW should be able to do?)

Overview: We need to make a program to identify proper fractions and simplify them, identify improper fraction and make them mixed fractions.

Use cases:

*Students learning to do fractions in math*

*Math Majors*

*People like me who hate dealing with fractions*

*People without calculators.*

* 1. Requirements:

The Software will take the numerator and denominator integers and output simplified proper and mixed fractions

The Software shall be written in JAVA.

The Software shall include the scanner.util package to take in input

The SW shall not have any coding errors.

The SW shall be documented well.

The SW shall be readable.

The SW shall be testable.

The SW will not crash.

The SW will throw back any invalid.

1. Design: (10 pts)

(Describe the major steps for solving the problem. Only a flow chart will be acceptable.)

Have the user input the numerator

Check to ensure it is a int

Have the user input the denominator

Check to insure it is an int

If the numerator is greater than the denominator simplify into mixed fractions

Output number as such

If the numerator is greater than the denominator and can be simplifyed into integer

Output number as such

If the denominator is greater than the numerator

Output number as such

1. Coding: (10 pts)

(Copy and Paste Source Code here. Format your code using Courier 10pts. Screen shot of your code is also acceptable.)

**package** cs210;

**import** java.util.Scanner;

**import** java.awt.Desktop;

**import** java.io.IOException;

**import** java.net.URI;

**import** java.net.URISyntaxException;

**import** java.lang.Math;

**public** **abstract** **class** Homework4 {

**public** **static** **void** main(String[] args) **throws** URISyntaxException, IOException {

Scanner newSc = **new** Scanner(System.***in***);

//boolean retry = true;

/\*

\* boolean moveForward = false; int version = 0; if (version >= 1) { while

\* (moveForward == false){ System.out.println("Continue? 1/0"); String input =

\* newSc.nextLine(); input.toLowerCase(); if (input == "1") {

\* System.out.println("Sounds Good"); }else if(input == "0"){

\* System.out.println("Goodbye"); retry= false; }else {

\* System.out.println("What was that?"); }}}

\*/

**int** nr = 0;

**int** dr = 0;

// version+=1;

**boolean** moveOn = **false**;

**int** con = 0;

//while (retry == true) {

URI uri= **new** URI("https://www.youtube.com/watch?v=eaEMSKzqGAg");

java.awt.Desktop.*getDesktop*().browse(uri);

System.***out***.println("Welcome to Ben Co's Fraction Calculator!!!");

**while** (moveOn == **false**) {

System.***out***.println("Please insert Numerator");

String numerator = newSc.next();

**try** {

**int** ntor = Integer.*parseInt*(numerator);

nr = ntor;

con = 1;

}**catch**(Exception numberformat){

System.***out***.println("Numerator Invalid!");

con = 0;

}**finally** {

**if** (con == 1){

**break**;

}

}

}

moveOn = **false**;

**while** (moveOn == **false**) {

System.***out***.println("Please insert Denominator");

String denominator = newSc.next();

**try** {

**int** dtor = Integer.*parseInt*(denominator );

dr = dtor;

**try** {

**int** wholeNum = nr / dr;

con = 1;

}**catch**(Exception divideByZero) {

**double** num = Math.*random*() \* 10;

**int** num1 = (**int**) num;

**if** ((num1 == 1) || (num1 == 2)) {

URI e= **new** URI("https://www.youtube.com/watch?v=Q2Me3MJd130");

System.***out***.print("Error");

java.awt.Desktop.*getDesktop*().browse(e);

con = 0;

}**else** **if**((num1 == 3) || (num1 == 4)) {

URI e= **new** URI("https://www.youtube.com/watch?v=WWaLxFIVX1s");

System.***out***.print("Error");

java.awt.Desktop.*getDesktop*().browse(e);

con = 0;

}**else** **if**((num1 == 5) || (num1 == 6)) {

URI e= **new** URI("https://www.youtube.com/watch?v=5GfOlP8FKt0");

System.***out***.print("Error");

java.awt.Desktop.*getDesktop*().browse(e);

con = 0;

}**else** **if**((num1 == 7) || (num1 == 8)) {

URI e= **new** URI("https://www.youtube.com/watch?v=5GfOlP8FKt0");

System.***out***.print("Error");

java.awt.Desktop.*getDesktop*().browse(e);

con = 0;

}**else** {

URI e= **new** URI("https://www.youtube.com/watch?v=Pw2sex1mJNI");

System.***out***.print("Error");

java.awt.Desktop.*getDesktop*().browse(e);

con = 0;

}

}

}**catch**(Exception numberformat){

System.***out***.println("Denominator Invalid!");

con = 0;

}**finally** {

**if** (con == 1){

**break**;

}

}

}

**int** status = 0;

**if** (nr < dr) {

status = 1;

}

**if** (nr>dr) {

**if** ((nr%dr)==0){

status =3;

}**else** {

status = 2;

}

}

**switch**(status) {

**case** 1:

//6 / 7 is a proper fraction

System.***out***.println(nr + " / " + dr +" is a proper fraction");

**break**;

**case** 2:

//16 / 3 is an improper fraction and its mixed fraction is 5 + 1 / 3.

**int** remainder = nr % dr;

**int** wholeNum = nr / dr;

System.***out***.println(nr + " / " + dr +" is a improper fraction and its mixed fraction is "+ wholeNum + " + "+ remainder+ " / "+ dr);

**break**;

**case** 3:

//6 / 2 is an improper fraction and it can be reduced to 3

**int** wNum = nr / dr;

System.***out***.println(nr + " / " + dr +" is a improper fraction and it can be reduced to "+ wNum);

**break**;

}

}

//}

}

1. Testing: (10 pts)

(Describe how you test this program, and attach your results screen shots here. For this homework at least 6 test cases are required. Be clear in your results.)



