## CSCI 145 PA \_\_7\_\_ Submission

## Due Date:\_\_\_Apr 17, 2023\_\_\_ Late (date and time):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Name(s):\_\_\_\_\_\_Ivan Leung\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exercise 1 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

Input/output below:

Exercise 2 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

Input/output below:

Exercise 3 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

Input/output below:

*Add more exercises as needed*

Exercise 4 -- need to submit source code and I/O  
 -- check if completely done \_\_x\_\_ ; otherwise, discuss issues below

Pseudocode below if applicable:

Source code below:

**package** pa7;

**import** java.util.Scanner;

**import** java.text.NumberFormat;

**public** **class** FractionArithmetic {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

**final** String add = "+";

**final** String subtract = "-";

**final** String multiple = "\*";

**final** String divide = "/";

**final** String SENTINEL\_VALUE = "%";

**int** questionsAttempted = 0;

**int** totalCorrectAnswer = 0;

**int** num1;

**int** num2;

**int** denom1;

**int** denom2;

String catcher;

String operation;

**int** answerNum;

**int** answerDenom;

RationalNumber input1;

RationalNumber input2;

RationalNumber inputAnswer;

RationalNumber actualAnswer = **new** RationalNumber(0, 1);

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

NumberFormat percent = NumberFormat.*getPercentInstance*();

percent.setMaximumFractionDigits(1);

System.***out***.println("Ivan Leung's Rational Tutorial Program\n");

System.***out***.println("Please follow instruction carefully.\nEnter your operation like 1 / 2 + 1 / 4.");

System.***out***.println("You must enter a valid operation.\nEnter operator q to stop the program (0 / 1 % 0 / 1).");

num1 = num2 = denom1 = denom2 = 1;

**do** {

System.***out***.print("\nPlease enter your operation --> ");

num1 = scan.nextInt();

catcher = scan.next();

denom1 = scan.nextInt();

operation = scan.next();

num2 = scan.nextInt();

catcher = scan.next();

denom2 = scan.nextInt();

input1 = **new** RationalNumber(num1, denom1);

input2 = **new** RationalNumber(num2, denom2);

**if** (!operation.trim().equals(SENTINEL\_VALUE)) {

System.***out***.print("Please enter your result --> ");

answerNum = scan.nextInt();

catcher = scan.next();

answerDenom = scan.nextInt();

inputAnswer = **new** RationalNumber(answerNum, answerDenom);

++questionsAttempted;

**switch** (operation.trim()) {

**case** add:

actualAnswer = input1.add(input2);

**break**;

**case** subtract:

actualAnswer = input1.subtract(input2);

**break**;

**case** multiple:

actualAnswer = input1.multiply(input2);

**break**;

**case** divide:

actualAnswer = input1.divide(input2);

**break**;

}

**if** (actualAnswer.compareTo(inputAnswer) == 0) {

System.***out***.println("Great job! It is correct.");

System.***out***.println(input1 + " " + operation + " " + input2 + " = " + inputAnswer);

++totalCorrectAnswer;

}

**else** {

System.***out***.println("It is incorrect:");

System.***out***.println(input1 + " " + operation + " " + input2 + " != " + inputAnswer);

System.***out***.println("The correct answer:");

System.***out***.println(input1 + " " + operation + " " + input2 + " = " + actualAnswer);

}

}

} **while** (!operation.equals(SENTINEL\_VALUE));

System.***out***.println("You have chosen to exit the program");

System.***out***.println("You answered " + totalCorrectAnswer + " out of " + questionsAttempted

+ (questionsAttempted == 0 ? " problem" : " problems")

+ " correctly (" + percent.format( (**double**) totalCorrectAnswer / questionsAttempted) + ").");

scan.close();

}

}

Input/output below:

Ivan Leung's Rational Tutorial Program

Please follow instruction carefully.

Enter your operation like 1 / 2 + 1 / 4.

You must enter a valid operation.

Enter operator q to stop the program (0 / 1 % 0 / 1).

Please enter your operation --> 1 / 2 + 1 / 4

Please enter your result --> 3 / 4

Great job! It is correct.

1/2 + 1/4 = 3/4

Please enter your operation --> 1 / 2 - 1 / 4

Please enter your result --> 1 / 4

Great job! It is correct.

1/2 - 1/4 = 1/4

Please enter your operation --> 1 / 2 \* 1 / 4

Please enter your result --> 1 / 8

Great job! It is correct.

1/2 \* 1/4 = 1/8

Please enter your operation --> 1 / 2 / 1 / 4

Please enter your result --> 2 / 1

Great job! It is correct.

1/2 / 1/4 = 2

Please enter your operation --> -1 / 4 + 1 / 20

Please enter your result --> -4 / 20

Great job! It is correct.

-1/4 + 1/20 = -1/5

Please enter your operation --> 5 / 3 - -1 / 3

Please enter your result --> 2 / 1

Great job! It is correct.

5/3 - -1/3 = 2

Please enter your operation --> 1 / 2 \* 0 / 1

Please enter your result --> 0 / 1

Great job! It is correct.

1/2 \* 0 = 0

Please enter your operation --> 1 / 90 + 2 / 55

Please enter your result --> 47 / 990

Great job! It is correct.

1/90 + 2/55 = 47/990

Please enter your operation --> 0 / 1 % 0 / 1

You have chosen to exit the program

You answered 8 out of 8 problems correctly (100%).

Answer for Question 1

Answer for Question 2

Extra Credit – provide if applicable

Pseudocode below if applicable:

Source code below:

Input/output below: