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Branch- AIML_A1

Java Assigment 7

Problem Statement- Write a Java application that will be able to add, subtract, multiply, divide, compare, convert to floating point, and find absolute value for rational numbers, with exception handling. The operations class with the functions are programmed in operations.java file. The driver class with implementing the code with functions from operations are programmed in rational.java file.

Code-

operations.java

```java
import java.lang.Math;

public class operations{

    // one rational number will be input as "num1/den1" and the other as
"num2/den2"
    int num1, num2, den1, den2;
    int num_result, den_result;

    public operations(int num1, int num2, int den1, int den2){
        this.num1 = num1;
        this.num2 = num2;
        this.den1 = den1;
        this.den2 = den2;
    }

    // add two rational numbers and return the result in the same format
"num/dem"
    public String add(){
        if (den1 == den2){
            num_result = num1 + num2;
            den_result = den1;
        }
        else{
            num_result = (num1*den2) + (num2*den1);
            den_result = den1*den2;
```

```java
        }
        return num_result+"/"+den_result;
    }

    // subtract two rational numbers and return the result in the same format
"num/dem"
    public String subtract(){
        if (den1 == den2){
            num_result = num1 - num2;
            den_result = den1;
        }
        else{
            num_result = (num1*den2) - (num2*den1);
            den_result = den1*den2;
        }
        return num_result+"/"+den_result;
    }

    // multiply two rational numbers and return the result in the same format
"num/dem"
    public String multiply(){
        num_result = num1*num2;
        den_result = den1*den2;
        return num_result+"/"+den_result;
    }

    // divide two rational numbers and return the result in the same format
"num/dem"
    public String divide(){
        //throwing divideByZero exception is the denominator is zero
        if (den2 == 0){
            throw new ArithmeticException("Divide by zero");
        }
        else{
            num_result = num1*den2;
            den_result = den1*num2;
            return num_result+"/"+den_result;
        }
    }

    // compare two rational numbers and return the result in the same format
"num/dem"
    public String compare(){
        if (num1/den1 == num2/den2){
            return "Both numbers are equal";
        }
        else if (num1/den1 > num2/den2){
            return "First number is greater";
```

```java
        }
        else{
            return "Second number is greater";
        }
    }

    // convert both rational numbers to floating point and return the result
    public String convert(){
        return "First number in floating point: "+(float)num1/den1+" Second
number in floating point: "+(float)num2/den2;
    }

    // find absolute value of both rational numbers and return the result
    public String absolute(){
        return "Absolute value of first number: "+Math.abs(num1/den1)+"
Absolute value of second number: "+Math.abs(num2/den2);
    }
}
```

rational.java

```java
public class rational {
    public static void main(String[] args) {
        // get the input from command line arguments with try catch block to
handle strings words as input
        try{
            int num1 = Integer.parseInt(args[0]);
            int den1 = Integer.parseInt(args[1]);
            String operator = args[2];
            int num2 = Integer.parseInt(args[3]);
            int den2 = Integer.parseInt(args[4]);

            operations op = new operations(num1, num2, den1, den2);
        switch(operator){
            case "+":
                System.out.println(op.add());
                break;
            case "-":
                System.out.println(op.subtract());
                break;
            case "x":
                System.out.println(op.multiply());
                break;
            case "/":
                System.out.println(op.divide());
                break;
            case "compare":
```

```java
                System.out.println(op.compare());
                break;
            case "abs":
                System.out.println(op.absolute());
                break;
            case "convert":
                System.out.println(op.convert());
                break;
            default:
                System.out.println("Invalid operation");
        }


        }
        catch(Exception e){
            System.out.println("Invalid input");
            System.exit(0);
        }
    }

}
```

Output:

```
PS C:\Users\Aadith Sukumar\Desktop\E-Learn\SIT\Second Year\Sem 4\PIJ Lab>  & 'C:\Program Files\Eclipse Adoptium\
jdk-17.0.5.8-hotspot\bin\java.exe'  '-XX:+ShowCodeDetailsInExceptionMessages'  '-cp'  'C:\Users\Aadith Sukumar\AppD
ata\Roaming\Code\User\workspaceStorage\3f53eda9d49fc81f90c79e3fb9f17c51\redhat.java\jdt_ws\PIJ Lab_9b73243c\bin'
 'Assgn7_calc.rational'  4 2  + 4 5
28/10
PS C:\Users\Aadith Sukumar\Desktop\E-Learn\SIT\Second Year\Sem 4\PIJ Lab>  & 'C:\Program Files\Eclipse Adoptium\
jdk-17.0.5.8-hotspot\bin\java.exe'  '-XX:+ShowCodeDetailsInExceptionMessages'  '-cp'  'C:\Users\Aadith Sukumar\AppD
ata\Roaming\Code\User\workspaceStorage\3f53eda9d49fc81f90c79e3fb9f17c51\redhat.java\jdt_ws\PIJ Lab_9b73243c\bin'
 'Assgn7_calc.rational'  2 4 compare  6 12
Both numbers are equal
PS C:\Users\Aadith Sukumar\Desktop\E-Learn\SIT\Second Year\Sem 4\PIJ Lab>  & 'C:\Program Files\Eclipse Adoptium\
jdk-17.0.5.8-hotspot\bin\java.exe'  '-XX:+ShowCodeDetailsInExceptionMessages'  '-cp'  'C:\Users\Aadith Sukumar\AppD
ata\Roaming\Code\User\workspaceStorage\3f53eda9d49fc81f90c79e3fb9f17c51\redhat.java\jdt_ws\PIJ Lab_9b73243c\bin'
 'Assgn7_calc.rational'  2 3 x 6 2
12/6
```

Github: Abhinav-kr-2807/JAVA: College Assignments (github.com)