

08.03.2017

BBM 104 1.Homework Lab Report

Aim

Aim of this homework is to do three operations. These are;

- *Finding and printing $\text{Arcsinh}(x)$ to console when $|x| < 1$
- *Finding and printing Armstrong numbers to console which has less or n digit number
- *Calculating reimann sum from a to b and for t sums for func1, func2, func3 and printing the result to the console.

Func1, func2 and func3 are hardcoded to program. These functions are:

$$*\text{Func1}(x) = x^2 - x + 3$$

$$*\text{Func2}(x) = (3 \sin(x) - 4)^2$$

$$*\text{Func3}(x) = \text{arcsinh}(x) \text{ for } |x| < 1$$

Inputs are taken from an txt file which has to be given as first argument when running this program.

Format of the input txt file can be seen below:

"operation name "+"inputs for the operation"

An Example of an input file can be seen below:

IntegrateReimann Func1 2 7 10

IntegrateReimann Func1 2 7 100

IntegrateReimann Func2 2 7 10

IntegrateReimann Func2 2 7 100

IntegrateReimann Func3 0.2 0.5 10

Arcsinh 0.8

Armstrong 3

Software Usage

This program is written in Java 8. It has prepared with help of eclipse neon. It has to run on java virtual machine.

Sample Results

input1.txt:

```
IntegrateReimann Func1 -5 12 40
IntegrateReimann Func2 -12 17 10
IntegrateReimann Func2 -12 17 100
IntegrateReimann Func3 0.2 0.6 50
Arcsinh 0.4
Armstrong 3
```

output:

```
IntegrateReimann Func1 -5 12 40 Result: 608.9107812499999
IntegrateReimann Func1 -5 12 200 Result: 609.1564312500011
IntegrateReimann Func2 -12 17 10 Result: 565.5404384807164
IntegrateReimann Func2 -12 17 100 Result: 568.4083507135506
IntegrateReimann Func3 0.2 0.6 50 Result: 0.15517076915650288
Arcsinh 0.4 Result: 0.39003531977071526
Armstrong 3 Result: 0 1 2 3 4 5 6 7 8 9 153 370 371 407
```

input2.txt

```
IntegrateReimann Func1 -8 6 150
IntegrateReimann Func2 -4 13 10
IntegrateReimann Func2 -4 13 50
IntegrateReimann Func2 -4 13 100
IntegrateReimann Func2 -4 13 150
IntegrateReimann Func3 -0.1 0.4 90
Arcsinh 0.8
Armstrong 2
```

output:

```
IntegrateReimann Func1 -8 6 150 Result: 298.6565037037038
IntegrateReimann Func2 -4 13 10 Result: 384.1318860305626
IntegrateReimann Func2 -4 13 50 Result: 382.1284469791137
IntegrateReimann Func2 -4 13 100 Result: 382.0504600486261
IntegrateReimann Func2 -4 13 150 Result: 382.0359648793622
IntegrateReimann Func3 -0.1 0.4 90 Result: 0.07398540630146695
Arcsinh 0.8 Result: 0.7326682568259975
Armstrong 2 Result: 0 1 2 3 4 5 6 7 8 9
```

Personal Comments

This program is my first program in java. I have learned python before. Therefore it was a bit hard for me to become used to variable type declarations. Another problem that i faced is that one cannot check whether a string is equal to another string with simply writin "x" == "x". My friend saved my program by showing me the appropriate way.

By making this program, i have learned:

- *Basic syntax of java
- *How to use eclipse
- *How to use scanners
- *How to do input-output operations with scanners