Project Name: Java on Eclipse Platform Math with Java

Subjects:

1. Riemann Sum
2. Maclaurin Series for approximation of Arcsinh(x)
3. Armstrong Numbers

An Overview Of Project: In this Project, I developed a very simple application which do some mathematical calculations.

- Integral computation via middle Riemann sum with in a range
- Numerical approximation of arcsinh(x) function by Maclaurin series
- Finding the Armstrong (narsist) numbers within a range

For making these operations, I read input.txt (commands) file

1-Riemann Sum

A numerical method for approximating an integral is Riemann sum which has been named after German mathematician Bernhard Riemann. The sum is calculated by dividing the region up into shapes (rectangles, trapezoids, parabolas, or cubics) that together form a region that is similar to the region being measured, then calculating the area for each of these shapes, and finally adding all of these small areas together.

2- Maclaurin Series for approximation of Arcsinh(x)

Maclaurin Series are special cases of Taylor Series where the series are centered at zero. Each of these series are sum of infinite number of terms and used for calculating a special function. For this operation, I implemented arcsinh(x) function as Maclaurin Series. For function arcsinh(x) value of “x” will be given by user. After calculating result using formula above, I will print it to the console. This will give us a precise enough result.

$arcsinh(x) = \sum_{n=0}^{\infty} \frac{(-1)^n (2n)!}{4^n \ (n!)^2 (2n+1)} x^{2n+1}$ for |x|<1

3-Armstrong Numbers

In recreational number theory, a narcissistic number (also known as an Armstrong number, after Michael F. Armstrong) is a number that is the sum of its own digits each raised to the power of the number of digits.

For example 407 and 153 are both Armstrong numbers since,

407 = 43 + 03 + 73

153 = 13+ 53+ 33

In this project one of our task is to find out and print the Armstrong numbers whose digit number is below or equal to the given digit parameter.