

REPORT

In the assignment we have 3 functions, first function is about Riemann Sum. The Riemann 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. This approach can be used to find a numerical approximation for a definite integral even if the fundamental theorem of calculus does not make it easy to find a closed-form solution. Second is about calculating $\sin(x)$ for this operation, we will implement $\arcsinh(x)$ function as Maclaurin Series. For function $\arcsinh(x)$ value of "x" will be given by user. After using the formula above, we get the result:

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

The third function is about the Armstrong number. 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.

I have written my code for Riemann Sum like this: firstly, I took 4 parameters (one string, three integers), string to control the functions' names. The first integer is for the starting point. The second is for the last point and third integer is for counting of partition. Secondly, I defined two double and an integer so the first double is for the sum of partitions area and the second double is for width (to find the width of partition I minused the second integer from the first integer and then divided to the third integer) of each partition and integer for "for loop" after that I controlled the functions' names. Next, I opened a for loop starting with 0 and the last point is the third integer which is the limit. After that, I have to find the lengths of each partition and to find area each partition is equal lengths multiplication width. This formula gives us the result of the sum of all partitions. Finally, outside of for loop I printed the functions' names and result value.

The second step's name is Arcsinh, I have written my code in the following way for Arcsinh. Firstly, I have created another function to calculate factorial (factorial function takes value then every step it decreases 1(int) and is multiplied by the value before it, when the value is 1, the function breaks) As the value I took 1 parameter (integer). I need to sum the first 30 values, so I opened a for loop after I wrote this code:

```
(Math.pow(-1,i)*fonk(2*i)*Math.pow(deger1,(2*i+1)))/(Math.pow(4,i)*Math.pow(fonk(i),2)*(2*i+1));
```

Finally, I printed this value and result of value.

The third step name is Armstrong Numbers, I have written my code like that for Armstrong Numbers. Firstly I opened a for loop and the limit of the for loop is digit power after that I created a while loop. The while loop break when number is 0. The number is in while, firstly the number divided by 10 after that I took power of remainder then the operation continue until remainder is 0. Finally, a if

REPORT

condition check the number and sum of digits of number power is equal or not. If the number is equal, I printed.