Programming Practices MINI PROJECT
Function Calculator

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1 Description of Project

Aim

The function calculator aims at calculating functional values of the functions chosen by the user. The standard calculator performs only simple arithmetic calculations, whereas the scientific calculator is hectic to be purchased and also it is not convenient to use it for a beginner. This calculator simplifies the common operations which are lengthy to be performed on paper.

Utility

Suppose when performing a complex task or when working on a giant project, if the user needs the values of simple mathematical operations, he/she goes for the calculator. But for performing simple function calculations, generally scientific calculator provides this functionality, which the general public may not have in hand. This calculator can be very easily used in such cases, as it is a feasible solution to this problem.

Why am I designing this?

I had a more aligned interest towards algebra, especially polynomials. So, I decided to merge the concepts of Algebraic mathematics and programming to create this tool which I think is very beneficial for the users out there. It was my shear interest in both of these subjects. I also found very high utility of this project.

2 Some of the outputs of the Project

Example 1. I started with selecting "Polynomial" as the function to work on:

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MATHEMATICAL FUNCTION CALCULATOR

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Please select the type of function, you want to work with:
1. POLYNOMIAL
2. EXPONENTIAL
3. LOGARITHMIC
4. TRIGONOMETRIC


PLEASE ENTER THE INDEX CORRESPONDING TO THE MENTIONED FUNCTIONS:1




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CONSTRUCTING THE POLYNOMIAL



Please enter the degree of the expression:8
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By entering the coefficients, I got the output:
Your polynomial is: $4x^8 + 3x^7 + 2x^6 + 1x^5 + 5x^4 + 6x^3 + 3x^2 + 0x^1 + 3$

Next, I decided to find its value at x = 4: [P.T.O.]
And I got the output as:

$4(4^8)+3(4^7)+2(4^6)+1(4^5)+5(4^4)+6(4^3)+3(4^2)+0(4^1)+3 = 322227$

```
Select one of the operations to be performed on the Polynomial:

1. Find expression value at one of the points
2. Contruct its graph -> (redirect to Wolfram Alpha)
3. Find its integral
4. Find its derivative

Please enter the corresponding index:1



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Please enter the point at which value of the function has to be found:4
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At x = "4" the value of the polynomial is:
4(4)^8 + 3(4)^7 + 2(4)^6 + 1(4)^5 + 5(4)^4 + 6(4)^3 + 3(4)^2 + 0(4)^1 + 3  =  ||          3

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THANK YOU FOR USING FUNCTION CALCULATOR!
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Example 2. This time, I chose "Logarithm" to work with:

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MATHEMATICAL FUNCTION CALCULATOR

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Please select the type of function, you want to work with:
1. POLYNOMIAL
2. EXPONENTIAL
3. LOGARITHMIC
4. TRIGONOMETRIC


PLEASE ENTER THE INDEX CORRESPONDING TO THE MENTIONED FUNCTIONS:3



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CONSTRUCTING THE LOGARITHM
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Further, I selected the function as $log(x^{1/6})$ and decided to get its graph:

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Please select f(x), i.e. in log(e)f(x), the function about which log(e) is to be calculated:
1.x^n
2.x^(1/n)
Please enter the corresponding index:2

Please enter n:
6

Please select the type of operation to be performed on the function:
1. Find expression value at one of the points
2. Contruct its graph -> (redirect to Wolfram Alpha)
3. Find its derivative
Please enter the corresponding index:2


Your function is logx^(1/6) = 1/6logx
Please either copy the below link and paste it to your browser:
OR you may click on "follow link" which appears when the link is clicked:

https://www.wolframalpha.com/input?i=log%28x%5E1%2F6%29

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Hence, I printed a link as output which the user "ctrl+click"(ed) on to get redirected to Wolfram Alpha website, which showed his/her required graph, as per his/her selection:

WolframAlpha computational intelligence

log(x^1/6)

NATURAL LANGUAGE | MATH INPUT | EXTENDED KEYBOARD | EXAMPLES

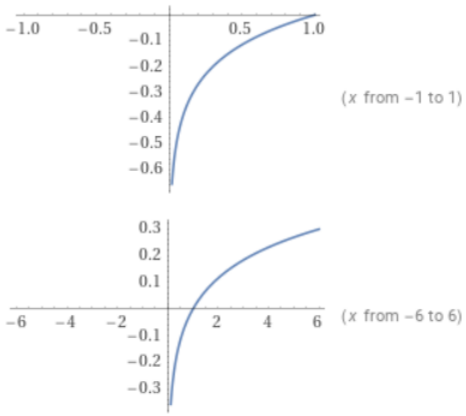
Assuming "log" is the natural logarithm | Use the base 10 logarithm instead

Input

$\log\left(\sqrt[6]{x}\right)$

$\log(x)$ is

Plots



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