FINDING THE DERIVATIVE OF POLYNOMIALS VIA DOUBLE LIMIT

PETRO KOLOSOV

Abstract. Differentiation is process of finding the derivative of rate of change of a function. Derivative itself is defined by the limit of function's change divided by the function's argument change as change tends to zero. In particular, for polynomials the function's change is calculated via Binomial expansion. This manuscript provides another approach to reach polynomial's function change as a limit of certain polynomial identity, and therefore expressing the derivative of polynomial as double limit.

Contents

1. Introduction

Your introduction here. Include some references [1, 2, 3, 4, 5, 6]. Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more

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recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

Figure example

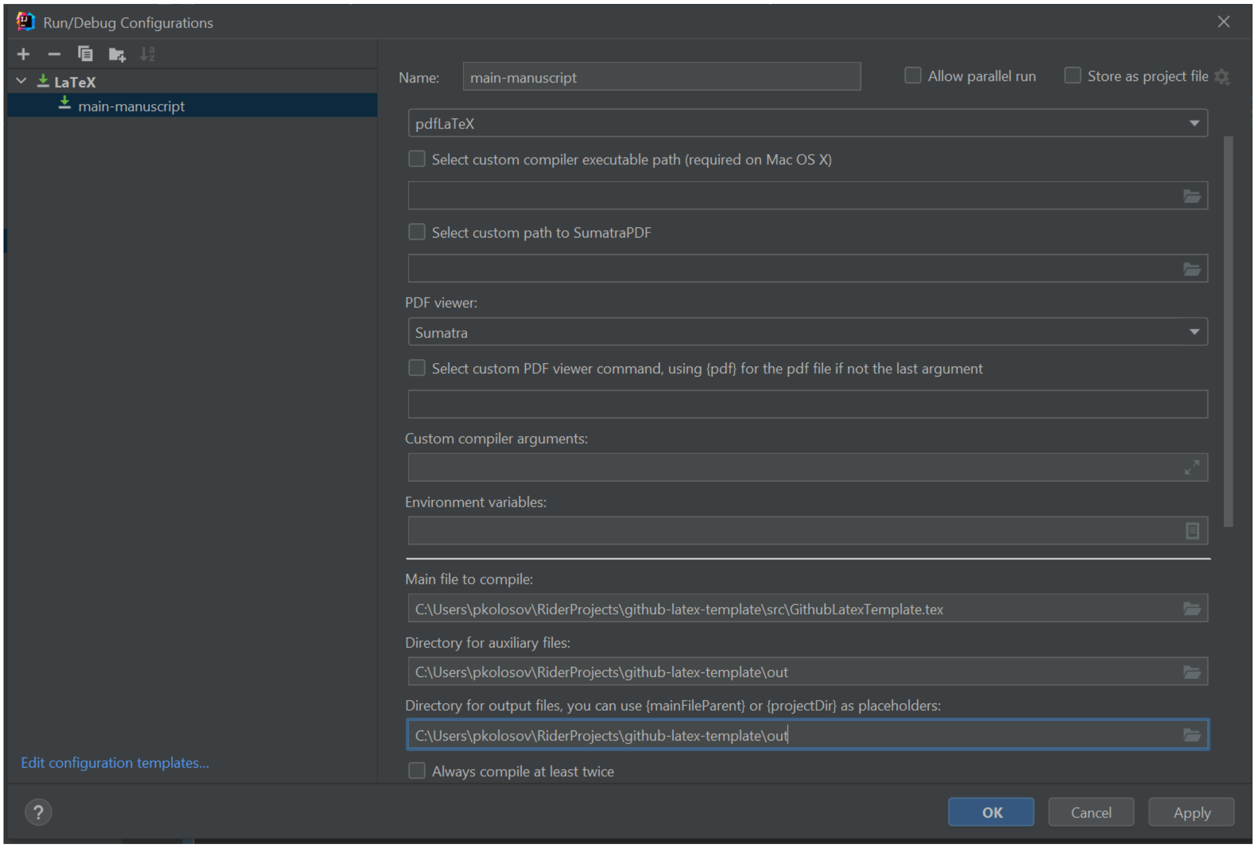

Figure 1. Figure example.

$$\left\llbracket \begin{matrix} a \\ b \end{matrix} \right\rrbracket_m$$

$$\left\llbracket \begin{matrix} a \\ b \end{matrix} \right\rrbracket_m$$

And for any natural m we have polynomial identity

$$x^m = \sum_{k=1}^{m} T(m,k) x^{[k]} \tag{1.1}$$

where $x^{[k]}$ denotes central factorial defined by

$$x^{[n]} = x \left(x + \frac{n}{2} - 1 \right)^{\underline{n-1}}$$

where $(n)^{\underline{k}} = n(n-1)(n-2)\cdots(n-k+1)$ denotes falling factorial in Knuth's notation. In particular,

$$x^{[n]} = x\left(x+\frac{n}{2}-1\right)\left(x+\frac{n}{2}-1\right)\cdots\left(x+\frac{n}{2}-n-1\right) = x\prod_{k=1}^{n-1}\left(x+\frac{n}{2}-k\right)$$

2. Conclusions

Conclusions of your manuscript.

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Software Developer, DevOps Engineer

Email address: kolosovp94@gmail.com

URL: https://kolosovpetro.github.io