Exponential function approximation

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June 24, 2021

1 Exponential function

We have the exponential function, which is defined by

$$\exp(x) = \sum_k \frac{x^k}{k!} = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + ...$$

A quick and dirty approximation to this function is

$$\exp(x) = 1+x\left(1+\frac{x}{2}\left(1+\frac{x}{3}\left(1+\frac{x}{4}\left(1+\frac{x}{5}\left(1+\frac{x}{6}\left(1+\frac{x}{7}\left(1+\frac{x}{8}\left(1+\frac{x}{9}\left(1+\frac{x}{10}\right)\right)\right)\right)\right)\right)\right)\right)$$

Which is an expansion of the exponential function. It is easily seen, if the parenthesies are calculated.

Plots of the two functions are found in figure 1.

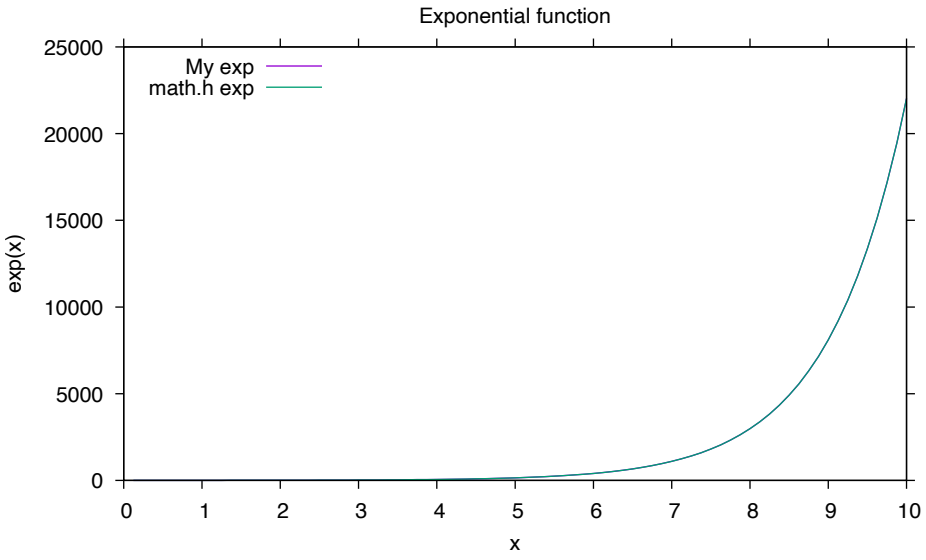

Figure 1: Exponential functions

From which it is evident that the quick and dirty implementation works well in this interval.