MA311 (Scientific computing)-IITG

ASSIGNMENT-4

Date: 29-07-2018

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1. Use the stirling approximation $n! \approx s_n = \sqrt{2\pi n}(\frac{n}{e})^n$ to compute the factorial of numbers from 1 to 10. List the corresponding absolute and relative errors. Comment on the observation; which error calculation you prefer in this case and why?

2. Let $f(x) = \sin x$ and $x_0 = 1.2$. Compute the error in the following approximation manually $f'(x_0) \approx \frac{f(x_0+h)-f(x_0)}{h}$, and show that the error depends on the parameter h. Plot the h vs absolute error graph for values $h <= 10^{-10}$(in log-log scale). Indicate what happens when we reduce the size of h drastically? write your comments on this behavior.