Assignment 1 *(Numerical Methods-Scott Zhang-2014)*

Fraction $\frac{2}{2-x}$ can be represented by the following infinite series

$$\frac{2}{2-x} = 1 + \frac{x}{2} + (\frac{x}{2})^2 + (\frac{x}{2})^3 + ... \qquad (\left|\frac{x}{2}\right| < 1)$$

and can hence be approximated as

$$\frac{2}{2-x} \approx \sum_{1}^{k} (\frac{x}{2})^{n-1}.$$

where n, k both are positive integers.

1. For $x = 0.2,$ calculate the approximation to the fraction and the resulted relative deviation, if k is 4, 5, 6 and 7, respectively.
2. Repeat the calculations in question 1 for $x = 0.4, 0.6$ and 0.8, respectively.

Requirements

1. Write a program using a language of your choice to carry out all the calculations.
2. Submittal should include 1) tabulated results, and 2) a print of the program.
3. All the approximations are rounded to 6 decimal places, and all the relative deviations are expressed using scientific notation with 2 significant digits.
4. Due date: Sept. 12, 2014