CHE 581
Assignment 3
Due: Friday, 8 February 2019

Errors

4.2 -- Do this both by hand (you can show this as a comment in your assignment script if you like) and also by using 'bin2dec'. The syntax for this command is, for example, bin2dec('1010101') to convert the binary number 1010101.

4.4 -- This problem helps us understand the limits of finite arithmetic.
4.11 -- This problem is an excuse to practice loops and computing errors explicitly

Numerical Integration

** NOTE** When the problem asks for the "composite" rules, please use the rules in their most primitive form—e.g., Equation 19.16 for the Trapazoidal rule. I find this much closer to the "mathematical intuition" of the problem.
→ Our goal is to build expertise in **understanding**, not necessarily efficiency!
→ Do not code the composite rules directly please!
→ This means that you will have to slightly modify the "trap" code given in the text on page 500.

19.2—You can show your analytic work in a comment in your code if you like.
19.12
19.16—Use the trapezoidal rule.

Extra Credit (2 points)

The pdf for a 2-variable problem (with zero correlation) is given by

$$f(x,y)=\frac{1}{2\pi\sigma_x\sigma_y}\exp\left(-\frac{x^2}{2\sigma_x^2}-\frac{y^2}{2\sigma_y^2}\right)$$

Assume that $\sigma_x^2=\sigma_y^2=1$. Compute the following using the trapezoidal rule. Code this up yourself (not using MATLAB's built-in functions).

$$I_1=\int_{y=-1}^{y=1}\int_{x=-1}^{x=1} f(x,y)dxdy$$

$$I_2=\int_{y=-2}^{y=2}\int_{x=-2}^{x=2} f(x,y)dxdy$$

$$I_3=\int_{y=-3}^{y=3}\int_{x=-3}^{x=3} f(x,y)dxdy$$