

Homework 1. Due Wednesday, Feb. 6

1. (5pts) Problem 1 from Section 2.10 in [D. Bindel's and J. Goodman's book "Principles of Scientific Computing"](#).
2. (5pts) In any suitable language of your choice (C/C++, Matlab, or Python) make x to be a 64-bit floating point number. Note that this is type `double` in C/C++, the default type in Matlab, or using Python's numpy library `np.float64`, set its value to 1 and then divide it by two until you get exactly zero. Find (a) the smallest nonzero floating point number and (b) the number of divisions by two necessary to achieve 0. Then reset x to 1 and keep multiplying it by 2 until you get `Inf`. Find (c) the largest floating point number, (d) the number of multiplications by two necessary to achieve `Inf`. Explain your answers in (b) and (d) using your knowledge regarding the structure of floating point numbers.
3. (5pts) Problem 3 from Section 2.10 in [D. Bindel's and J. Goodman's book "Principles of Scientific Computing"](#);
4. (5pts) Problem 7 from Section 2.10 in [D. Bindel's and J. Goodman's book "Principles of Scientific Computing"](#).