Dr. Stefan Schnabel SoSe 2019

Numerical Methods
Homework 2

Due: Wednesday, April 24th, 11:00am
or per email on Tuesday to **cpopov59@gmail.com**

1. **Floating point**

   Find the (binary) 32-bit floating-point representation for the velocity of light (in $\frac{m}{s}$) and for the number π.

2. **Stability**

   a) Using a computer the function

   $$f(x) = \frac{1 - \cos x}{\sin x}$$

   has to be evaluated close to $x = 0$. (But **not** at $x = 0$!) Straightforward implementation might lead to problems. Why? What can be done instead?

   b) How does the sum

   $$\sum_{k=1}^{n} k^{-2}$$

   have to be calculated in a computer to achieve maximal accuracy? Write down a few lines C/C++ - code which do this calculation.