Technical University of Berlin
Faculty II - Mathematics and Natural Sciences
Institute of Mathematics
Dr. D. Peschka, A. Selahi

Numerical Mathematics II for Engineers

Homework Assignment 6

Submitted on December 2nd, 2019

by **Group 5**

Kagan Atci	338131	Physical Engineering, M.Sc.
Navneet Singh	380443	Scientific Computing, M.Sc.
Riccardo Parise	412524	Scientific Computing, M.Sc.
Daniel V. Herrmannsdoerfer	412543	Scientific Computing, M.Sc.

Exercise 1

a)

b)

c)

Exercise 2

a)

b)

c)

Exercise 3

a) Please refer to the online submitted `a06e03getPDE.py` file.

b and c) The grid size was empirically defined as $N = 20 + 10\sqrt{\varepsilon^{-1}}$.

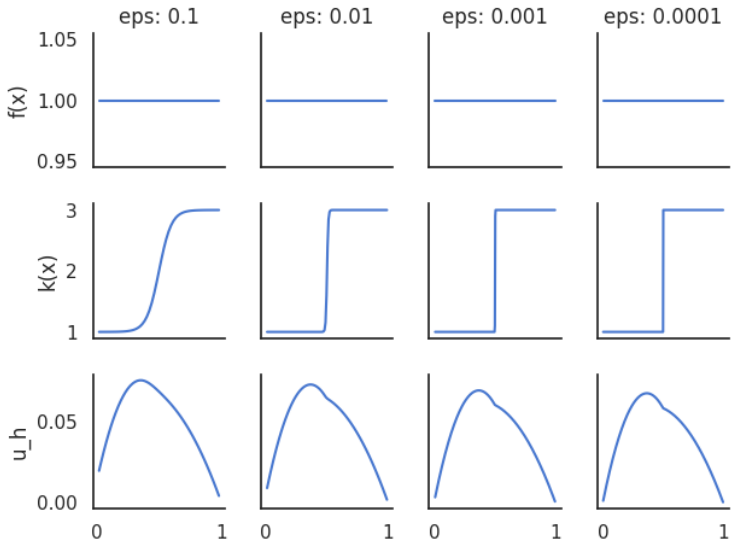

Figure 1 | Functions $f(x)$, $k(x)$ and u_h evaluated for $\varepsilon = 0.1, 0.01, 0.001, 0.0001$

The function $k(x)$ will behave as a Heaviside step function for $\varepsilon \to 0$.