

Student's name:

Information Technology: Final exam 10.02.2015

Question 1

Define two Octave functions:

- $f(x) = \ln(0.1x)$
- $fp(x) = 1/x$

Using the above functions write Octave program to write out the subsequent elements of the sequence:

$$x_0 = 0.1$$
$$x_{i+1} = x_i - \frac{f(x_i)}{fp(x_i)} \quad \text{for } i \geq 0$$

for which the following condition is true :

$$|f(x_i)| > 10^{-5}$$

CAUTION: natural logarithm function is called "log" in Octave.

Question 2

Matrix **A** has elements:

$$A_{ij} = (-1)^{2i} \cdot (-1)^{j-i}$$

Write a function that for an input matrix $B_{N \times N}$ calculates

$$\sum_{(i,j)|A_{ij}>0} B_{ij}$$

In other words the function should calculate the sum of elements of matrix **B** for which the corresponding elements of matrix **A** are positive.