

## Task for lecture 2

- Consider the least square problem called Pontius.
- Solve the problem by writing it as a system of equations and solve by using LU and Cholesky. (Hint: Use normal equations)
- Print the Solutions and relevant information from the calculations.

For Pontius set:

$$\mathbf{A} = \begin{bmatrix} 1 & x_1 & x_1^2 \\ 1 & x_2 & x_2^2 \\ \dots & \dots & \dots \end{bmatrix} \quad (1)$$

- Repeat for Filip.

For Filip set:

$$\mathbf{A} = \begin{bmatrix} 1 & x_1 & x_1^2 & \dots & x_1^{10} \\ 1 & x_2 & x_2^2 & \dots & x_2^{10} \\ \dots & \dots & \dots & \dots & \dots \end{bmatrix} \quad (2)$$

The supplied Lecture2.cpp file contains a small piece of code to load the data into your program (be aware of the include path). Please note that you will have to add additional header files to use the LU and Cholesky method.

For validation, the solved parameters can be found in the "Pontius.dat" and "Filip.dat" files.

Problem Source:

Pontius: <http://www.itl.nist.gov/div898/strd/lls/data/Pontius.shtml>

Filip: <http://www.itl.nist.gov/div898/strd/lls/data/Filip.shtml>