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Numerics and Simulation
Elective subject mathematics (DDM)

Exercise sheet 4, May 3, 2022

Exercise 16: Create a suitable design of a parallelization for a boundary element method based on the task channel model. Consider the setup and a matrix vector multiplication related to the system of linear equations:

$$V_h \underline{w} = \underline{g}$$

where

$$V_h[j,k] = -\frac{1}{2\pi} \int_{\tau_j} \int_{\tau_k} \log|x-y| ds_y ds_x$$

$$g_j = \int_{\tau_j} g(x) ds_x$$

for $j,k = 0,\ldots,N-1$.

Geometrical input: vertices $x_j \in \mathbb{R}^2$ for $j = 0,1,\ldots,N$, in particular $x_N = x_0$. An element (segment of a line) τ_j is described by the vertices x_j and x_{j+1}.