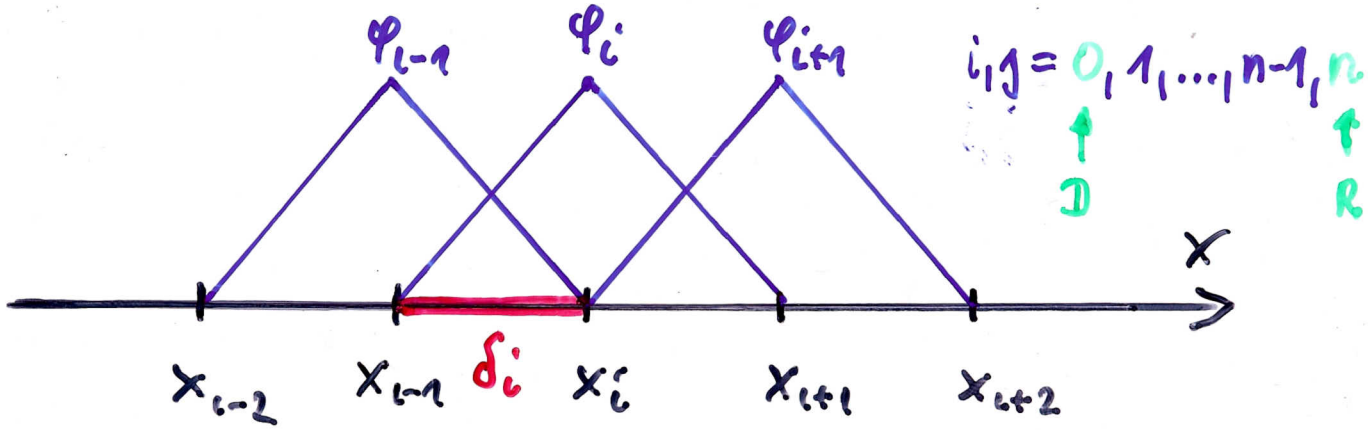
$$K_{ij} = a(\varphi_j, \varphi_i) = \int_a^b \varphi_j'(x)\,\varphi_i'(x)\,dx + \alpha_b\,\delta_{ni}\,\delta_{nj}$$



$i = 1, 2, \ldots, n$

$$K_{i-1,i-1} = \int_{x_{i-2}}^{x_{i-1}} \varphi_{i-1}'(x)\,\varphi_{i-1}'(x)\,dx + \int_{x_{i-1}}^{x_i} \varphi_{i-1}'(x)\,\varphi_{i-1}'(x)\,dx$$

$$K_{i-1,i} = \int_{x_{i-1}}^{x_i} \varphi_i'(x)\,\varphi_{i-1}'(x)\,dx$$

$$K_{i,i-1} = \int_{x_{i-1}}^{x_i} \varphi_{i-1}'(x)\,\varphi_i'(x)\,dx$$

$$K_{ii} = \int_{x_{i-1}}^{x_i} \varphi_i'(x)\,\varphi_i'(x)\,dx + \int_{x_i}^{x_{i+1}} \varphi_i'(x)\,\varphi_i'(x)\,dx$$

$i = 1, 2, \ldots, n$, $n = NE$