Finite element method - 1
Potential Flow

We have the equation for the potential flow Φ:
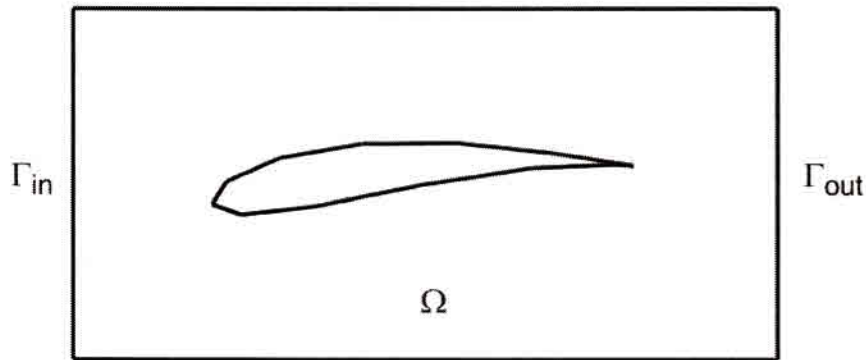
$$-\Delta\Phi = 0, \text{ in } \Omega$$

We impose the boundary conditions:

$$\mathbf{n}.\nabla\Phi = 1, \text{ on } \Gamma_{in}$$
$$\Phi = 0, \text{ on } \Gamma_{out}$$
$$\mathbf{n}.\nabla\Phi = 0, \text{ elsewhere}$$

We have that the air flow is irrotational therefore the velocity vector field is defined by:

$$u = -\nabla\Phi$$

Formulate the variational form of the problem, write the (R-G) form and compute the resulting system of equations. Use the functions for global matrix assembler and global load vector assembler from the previous assignment.