Heat Transfer Correlation 2.2
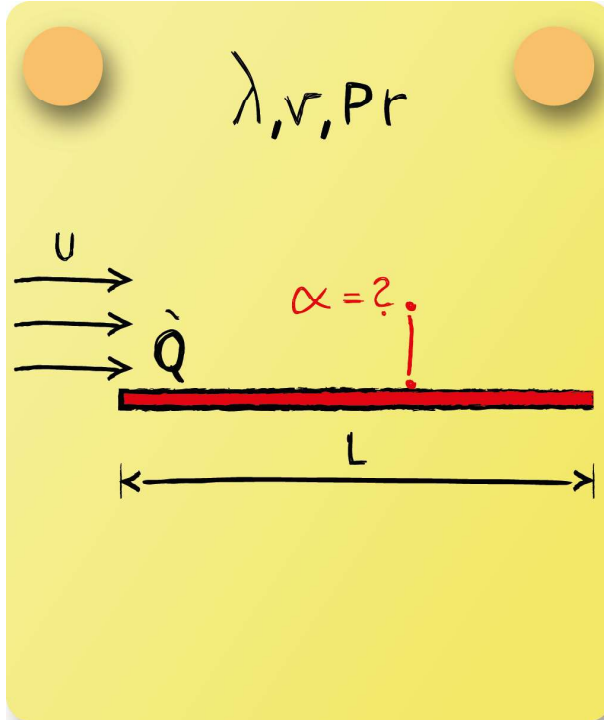

A fluid streams over a flat plate. Calculate the mean heat transfer coefficient $\bar{\alpha}$.

Reynolds number:

$$\mathrm{Re_L} = \frac{u \cdot L}{\nu} = 2.40 \cdot 10^3$$

Nusselt number:

$$\overline{\mathrm{Nu_L}} = 0.664 \cdot \mathrm{Re_L}^{\frac{1}{2}} \cdot \mathrm{Pr}^{\frac{1}{3}} = 32.54$$

Heat transfer coefficient:

$$\bar{\alpha} = \frac{\overline{\mathrm{Nu_L}} \cdot \lambda_{\mathrm{f}}}{L} = 0.163 \ \mathrm{W/m^2 K}$$