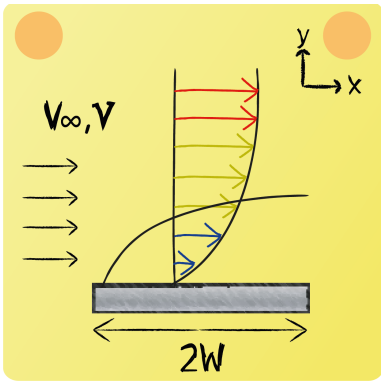
Lecture 2 Question 7

Give an expression for the average Nusselt number $\overline{\mathrm{Nu}_\mathrm{L}}$ for the given situation in the figure based on known parameters.



The general expression for the average Nusselt number is $\overline{\mathrm{Nu}_\mathrm{L}} = \frac{\overline{\alpha} L}{\lambda}$, where the characteristic length for the given case is $L = 2W$ and $\nu = \frac{\eta}{\rho}$ and the thermal conductivity λ is the thermal conductivity of the fluid.
Thus:

$$\overline{\mathrm{Nu}_\mathrm{L}} = \frac{2\overline{\alpha} W}{\lambda_f}$$