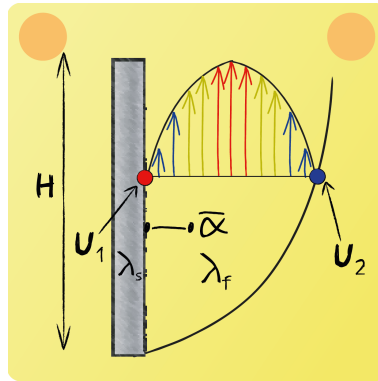# Lecture 10 Question 3

Give an expression for the Nusselt number $\overline{\mathrm{Nu}}$ for the given situation.

The standard expression for the Nusselt number is:

$$\overline{\mathrm{Nu}} = \frac{\alpha L_{\mathrm{c}}}{\lambda_{\mathrm{fluid}}}$$

The characteristic length has to be determined. For natural convection along a vertical plate, this is the height of the plate.

Which thus is:

$$L_{\mathrm{c}} = H$$

And therefore the Nusselt number can be expressed as:

$$\overline{\mathrm{Nu}} = \frac{\alpha H}{\lambda_{\mathrm{f}}}$$