Problem:

Maximize stiffness of a beam which is subjected to constant heat flux at one end. The beam is fixed at both the ends. It has square cross-section, with variable side = $s(x)$. Write down the complete problem statement using L (length of the beam), E (Young's modulus), α (Thermal expansion coefficient), K (thermal conductivity), T0 (Initial temperature) and other quantities noted above and the additional ones that are needed. Maximum volume of material can be used is V*. Then, write the necessary conditions and set up the update formula for the side of the beam using the optimality criteria method.