Name_____ Student number_____

Home assignment 3

A bar is free to move in the horizontal direction as shown. At $t = 0$, the bar moves with constant velocity $\dot{U}$ to the direction of the $x-$axis displacements being zeros. Use the Finite Difference Method on a regular grid with $i \in \{0,1,2\}$ and the Crank-Nicolson method with step size Δt to find the displacements and velocities at $t = \Delta t$. Cross-sectional area A, density ρ of the material, and Young's modulus E of the material are constants.