

**Exercise 3**

Consider  $u_{tt} = c^2 u_{xx}$  for  $0 < x < l$ , with the boundary conditions  $u(0, t) = 0$ ,  $u_x(l, t) = 0$  and the initial conditions  $u(x, 0) = x$ ,  $u_t(x, 0) = 0$ . Find the solution explicitly in series form.