

# 1 EAS 572: Assignment 1

Perform a dimensional analysis of the mechanical system shown in Fig.(1).

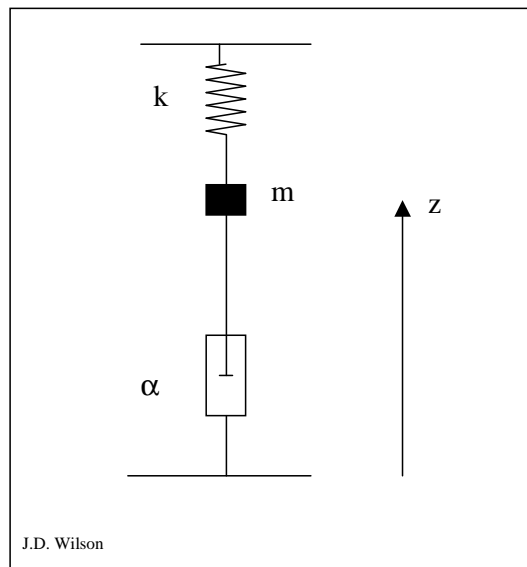


Figure 1: *The mass  $m$  is connected to a fixed point on the ceiling via a spring (spring constant  $k$ ) and to a fixed point on the floor via a damper (damping constant  $\alpha$ ). Assume that initially ( $t = 0$ ) the mass is displaced through a distance  $\Delta z$  from its equilibrium position. Perform a dimensional analysis to find functional relationships for the period ( $T$ ) of the motion and the timescale ( $\Gamma$ ) for the decay of any oscillation.*