An open kinematic chain with two uniform rigid rods 1 and 2 of mass \(m_1 = m_2 = m\) and length \(L_1 = L_2 = L\) is shown in the figure. The rod 1 is connected to the ground by a pin joint at \(A\) and to the rod 2 by a pin joint at \(B\). The rods are constrained to move in a vertical plane \(xy\). A spring of elastic constant \(k\) and a viscous damper with a damping constant \(c\) are opposing the relative motion of the link 2 with respect to link 1. The local acceleration of gravity is \(g\).

1. Find the equations of motion for the RR kinematic chain using Newton-Euler method;
2. Solve the equations of motion using MATLAB.

Numerical application: \(m_1 = m_2 = 1\) kg, \(L_1 = L_2 = 1\) m, \(g = 10\) m/s\(^2\), \(k = 100\) N m/rad, \(c = 10\) N m s/rad, \(q_1(0) = \pi/3\) rad, \(q_2(0) = \pi/6\) rad, \(\dot{q}_1(0) = \dot{q}_2(0) = 0\) rad/s.
Figure