Day 17 Problem Statement

Solve the following BVP:

$$\frac{d^2T}{dx^2} = -a\left(1 - \frac{x}{L}\right)$$

where $L = 2$, $a = 1000$. Use the following boundary conditions:

$$T(0) = 0$$
$$\left.\frac{dT}{dx}\right|_L = 0$$

The analytical solution to this problem (for comparison) is:

$$T = \frac{aL^2}{2}\left(\frac{x}{L} - \left(\frac{x}{L}\right)^2 + \frac{1}{3}\left(\frac{x}{L}\right)^3\right)$$