Mechatronics Engineering and Automation Program
CSE473: Computational Intelligence
Lab Assignment #04

The objective of this assignment is to find a solution for the following set of non-linear equations using the SciPy optimization module: -

$$g_1(x_1, x_2, x_3) = 3x_1 - \cos(x_2 x_3) - 0.5 = 0$$
$$g_2(x_1, x_2, x_3) = x_1^2 - 81(x_2 + 0.1)^2 + \sin(x_3) + 1.06 = 0$$
$$g_3(x_1, x_2, x_3) = \exp(-x_1 x_2) + 20x_3 + (10\pi - 3)/3 = 0$$

The problem is now reformulated to be a minimization of the following suggested objective function: -

$$F(x_1, x_2, x_3) = \frac{1}{2}[g_1(x_1, x_2, x_3)]^2 + \frac{1}{2}[g_2(x_1, x_2, x_3)]^2 + \frac{1}{2}[g_3(x_1, x_2, x_3)]^2$$

Write a Python code to get the solution and report the results listing any special settings of the optimization module parameters.
