Lab 11

1. Write a C++ program which uses Euler's method to estimate a solution for the initial value problem

$$\frac{dy}{dx} = \frac{y}{x} + 2x^2y, \quad y(1) = 2.$$

2. Solve the initial value problem $\frac{dy}{dx} = \frac{x^2}{y}, \quad y(0) = 1$ using separation of variables.

   Write a C++ program that uses Euler's method to find an approximate solution to the above initial value problem.

   Get the program to output the generated approximate solution values and the C++ version of the exact solution values over the interval $[0, 4]$ to a text file called **diff.txt**.

   Use the data in this text file to create a graph in Excel of the estimated solution and the exact solution on the same axes.