CS421 - Computer Modeling and Simulation

Class Activity 2

Due Date: 6th April, 2022

Consider the following differential equation with the given initial condition:

$$dp/dt = 0.1\ P$$
$$P(t=0) = 100$$

1. Define a function in any programming language that, given a time stamp, returns the value of the analytical solution for the above differential equation.
2. Define a function to solve the given differential equation using the Euler method. The function should accept the time stamp to find the population at and the time step size.
3. Define a function to find the error between the solutions of both analytical and numerical methods.
4. The error should be determined for at least five different values of time steps.
5. Define a function that plots the error vs time step and comment on the relationship between the error and time step.