

Exercise 2, page 165 in Logan

The exercise is to solve a differential equation by perturbation and by numerical means. The solution is plotted in the figures below along with a Taylor expansion of the perturbed solution. I have plotted them with two different time steps. I have also included plots of the area where the different solution methods starts to differ.

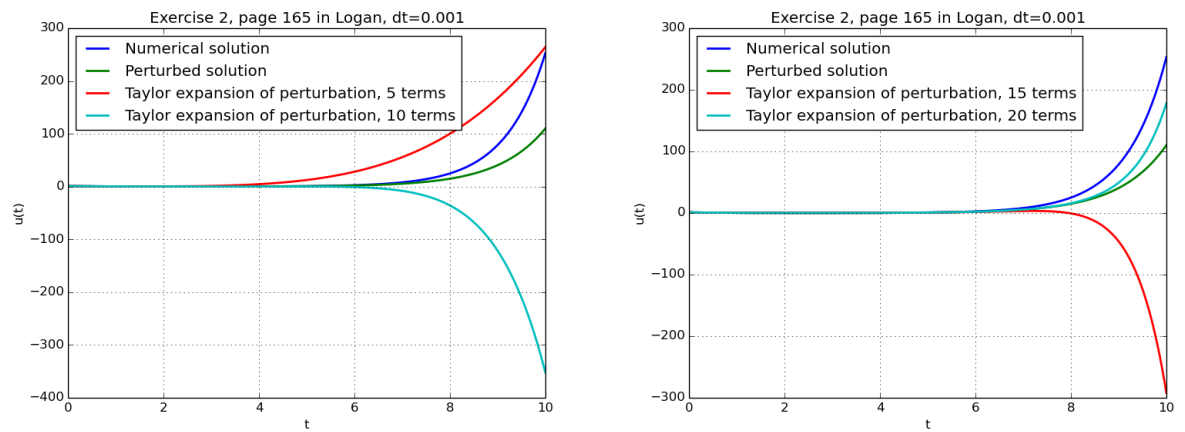


Figure 1: Solutions plotted with $dt=0.001$

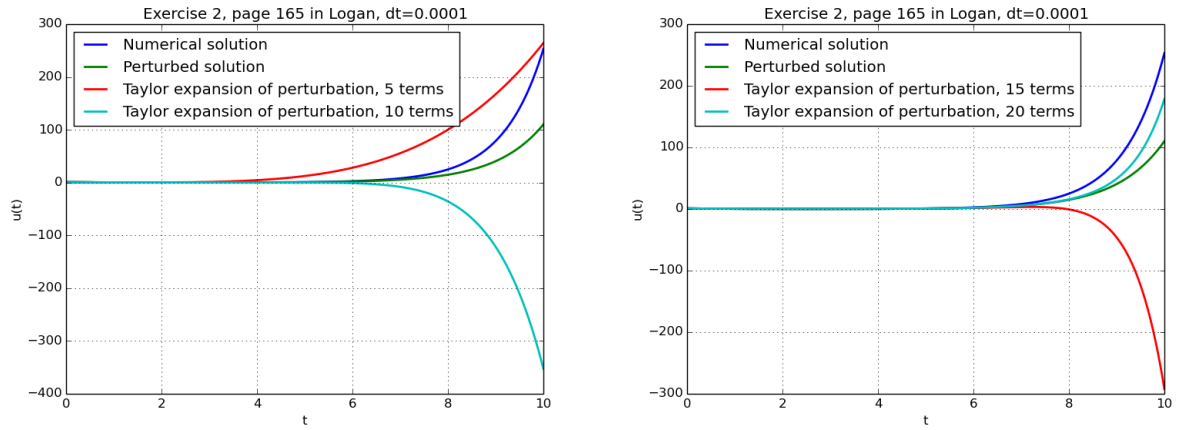


Figure 2: Solutions plotted with $dt=0.0001$

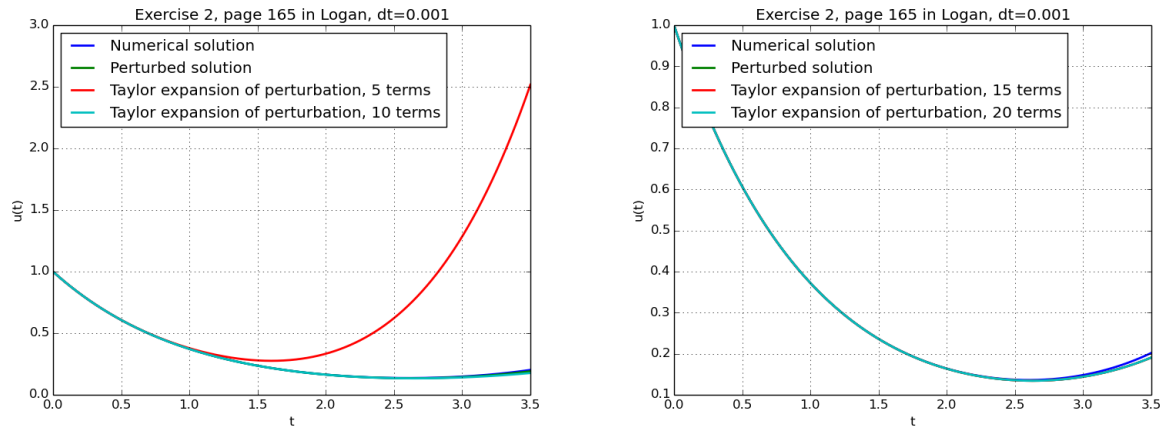


Figure 3: Solutions plotted around the area where the solutions starts to differ with $dt=0.001$