CS 3320 – Numerical Software

Module 1 Homework

Do the following problems in the textbook.

1. (10 pt) Problem 1.6
   The solution to the free-fall bungee jumper with linear drag coefficient is:
   $$v(t) = \frac{mg}{c'}\left(1 - e^{-\frac{c'}{m}t}\right)$$

2. (10 pt) Problem 1.15
   Instead of from t=0 to t=10 min, solve the problem from t=0 to t=1 min. (Solve the problem by hand.)

3. (10 pt) Problem 1.16

4. (10 pt) Problem 1.17
   You can use a spreadsheet application or a python program to solve this problem. However, your answer should include the coffer temperature at each time step.

5. (10 pt) Problem 1.24
   Hint: The weight of the ice sphere is balanced with the buoyancy force. The buoyancy force is equal to the weight of the seawater displaced by the ice sphere.