Programming Assignment 2 – Summary

1. Solve 1-D advection dispersion equation using C-N finite difference scheme

dx = 2.0m, nodal mesh at least 200m in length

* 1. Plot C/C0 (R = 1, v = 0.1 m/d)
     1. D = 0.01
     2. D = 0.1
     3. D = 1.0 m2/d
  2. Plot C/C0 (R = 3, v = 0.1 m/d)

t = 400 d, dt = 10 days, D = 0.1 m2/d (compare results to a)

1. Solve 1a using Galerkin-based finite element method using linear shape functions, plot the results

1. Compare analytical, finite difference, and finite element (R=1) for the following cases
   1. D = 0.1 m2/d, v = 0.1 m/d, dx = 2m, dt = 10 days, t = 400 days
   2. Same parameters as a except dt = 50 days
   3. Same parameters as a except v = 0.5 m/d and t = 200 d
2. What can you conclude about the relative accuracy of FDM and FEM methods as applied to advection-dispersion-reaction problems?

1. What effect does the magnitude of the groundwater velocity v have on the numerical solution?