Chapter 4

Applications: Field Data

The Shapes of Lakes: Contouring
Rising Bubbles: Animation
Water Table: Interpolation
Acid Rain: Physical Chemistry
Applications: Field Data

Übersicht

Plotting the contours of lakes and the positions of boreholes. Then bubbles in three dimensions, moving up a column in animation. A look at Darcy’s law for groundwater flow into lakes. Lastly, sulfur dioxide, carbon dioxide and ammonia contribute to the formation of acid rain. Data input to the computer and output to graphs, with procedures; this is the hub of analysis in the environmental sciences.

Guidewords:

data, fopen(), readline(), readdata(), fclose(), readlib(); bubbles, lookup, PLOT3D, bubble sequences, map(), colouring, streaking, resizing, insequence, animation; interpolation, formulation, Darcy’s law, hydraulic conductivity, contourplot(); acid rain, carbon dioxide, sulfur dioxide, ammonia, equilibrium, electroneutrality, kinetics, sulfate, pH

4.1 Contour Data

Here we dig deeply into the nitty-gritty of data. Indeed, it is a challenge to use Maple for this purpose. The simple spreadsheet is easier and a simplest programmer would know that such manipulations can be done with a few lines of code. Still, here WE are in control and we can make Maple simple and convenient. With experience, and a few procedures to do gross data handling, Maple can be rewarding; it can keep us from making errors.