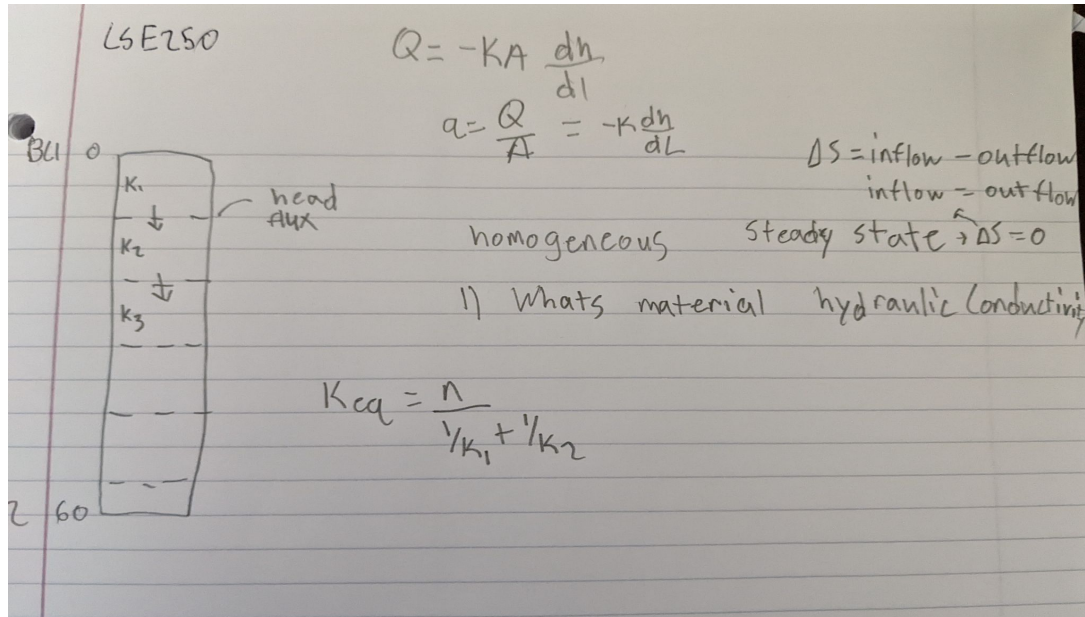


John Hubbell
Discussion Points

Pre Warning I am not very familiar with models and their parameters or how they work so I did my best to try and research and figure this out but they are likely not all right.

1. What are boundary conditions? Answer this both conceptually and mathematically.
 - The boundary conditions are realistic values for K.



2. What are model parameters? How do they (and don't they) represent the actual subsurface?
 - The models parameters are 0 - 60 for elevation above base and 0 - 100 for hydraulic head. They represent the actual subsurface conditions because they show how the two values relate to each other.
 - They might not represent the actual subsurface conditions because the values could maybe be larger in some areas. Also the assumptions that thickness is uniform, permeability is constant, and flow across any circumference is a constant are all made.
3. What are steady state conditions and how can they be identified from the Excel model results?
 - Steady state conditions are when things such as flow remain constant over time.
 - They can be identified on the excel from the graph where the slope is constant

4. Can you imagine how the model inputs could be stored in separate files rather than other spreadsheet cells? Describe the flow of information from a file that describes the other files that contain model-specific information about the system.
 - I would imagine the model inputs could be stored in another file and linked or copied to the excel spreadsheet. The file has to use information from other files to exist or work. So the excel model has to rely on the inputs which are the K values and K zones.
5. What is an iterative solution? Can you explain it to a hydrologist who is not a modeler? Can you describe (or imagine) how Excel finds the solution?
 - An iterative method is a procedure that uses an initial value to generate a sequence of improving approximate solutions for a problem.
 - An iterative solution method is a way you can help overcome the effect of uncertainties in measurements. I think what it means is that basically a model uses repetition of a sequence to help mitigate things that could mess up your model/results. I imagine Excel probably uses lots of repetition of sequences when it solves a problem.
 - In simple words direct solutions use a formula, iterative solutions are found by iterating until convergence
6. What is a direct solution? What are its (dis)advantages compared to an iterative (numerical) solution?
 - A direct solution is computed in a finite number of steps. Direct solutions are good for dense systems of small to moderate size. A disadvantage compared to an iterative solution is you must have all the variables necessary for the formula(s) and if one is off your final answer will be off.