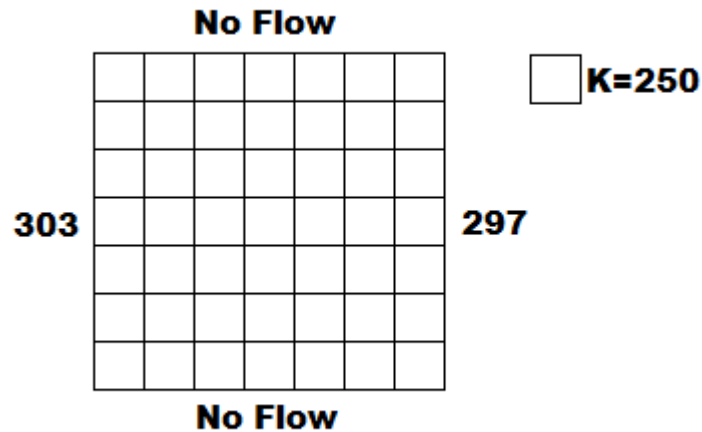


Using problem 1 of Work Session 2 as an example, this supplement will further define how to approach the assigned programming task.



Modeling Considerations

- A 7 x 7 grid implies that we will end up solving for the pressure head h in each of the $7 * 7 = 49$ defined cells. This means we will be solving a system of 49 equations with 49 unknowns.
- We will need to loop through *all* 49 unknowns. This requires the programmer (you) to determine a way to keep track of the ordering of the unknowns in a 1D vector. Further note that we are familiar with a 2D ordering method for matrices (and thus the unknowns). For example, (1,4) relates to the first row, fourth column; while (3,3) relates to the third row, third column. We now need to order each cell (assuming the 7 x 7 discretization) from 1 to 49 so that (1,1) = 1, (7,7) = 49, and – if we choose to move from left to right along rows – we will find that (1,4) = 4 and (3,3) = 17.
- We will (generally) need to account for five (possibly different, possibly equal to zero) coefficients associated with each unknown for each row of the big 49 x 49 coefficient matrix, A .
- Assume that the K value on a constant head boundary is equivalent to the K value of the adjoining cell. For example, if the left-side has a constant head boundary, we'll assume that the K value of the 'phantom cell' is such that $K_{i,0} = K_{i,1}$.

7	7	24					
1	1	1	1	1	1	1	bc_x_minus
303	303	303	303	303	303	303	
1	1	1	1	1	1	1	bc_x_plus
297	297	297	297	297	297	297	
0	0	0	0	0	0	0	bc_y_minus
1	1	1	1	1	1	1	
0	0	0	0	0	0	0	bc_y_plus
1	1	1	1	1	1	1	
250	250	250	250	250	250	250	K(:,;1)
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	K(:,;2)
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
250	250	250	250	250	250	250	
0	0	0	0	0	0	0	Well
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	
0	0	0	0	0	0	0	

To alter the data set, open it with notepad and make appropriate changes. If you open it with a spreadsheet program such as Excel (or Excel 07) it may ask you how to 'Import' the file – to do so press 'Finish' and make the necessary changes – however make sure it remains a .txt file when you close it and that you DO NOT save it as a .xls (or .xlsx) file.