

TEXAS TECH UNIVERSITY

Reservoir simulation project

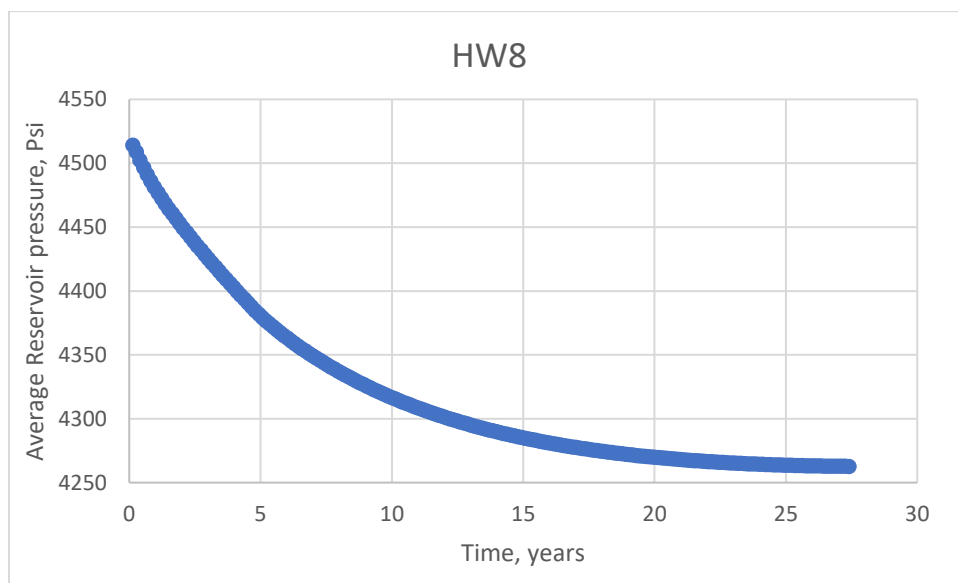
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Solution: In this homework, I divided the work into two sections:

- 1- Creating correct coefficient matrix and calculating the pressure distribution for one time step in EXCEL
- 2- Code everything in Python and check the one time step results with EXCEL file and extend it for more time steps.

Fortunately, I was successful to complete above tasks. My Δt was 50 days and I was able to run the simulation to reach the steady state. The following graph shows the average reservoir pressure.



Here is the matrix of the last time step from the graph above

5222.732	5200.59	5168.415	5144.711	1295.599	870.186	0
5272.547	5237.984	5186.84	5147.551	1703.392	1472.889	1115.492
5382.418	5317.013	5217.788	5134.935	2322.059	2185.161	2030.814
5579.123	5450.582	5251.898	5057.91	3056.636	2894.306	2772.088
5920.449	5669.25	5294.131	4797.226	3933.822	3542.025	3369.022
6523.289	6020.641	5463.441	4901.899	4325.3	3951.036	3770.619
6000	6430.372	5637.339	5015.874	4500.709	4146.881	3969.711

For calculation of flow rate, it was off for me too. I did not know why the results were not expectable. Also, I had to make two constraints that the block of producing and injecting well will not be below 0 and above 600 respectively.

This homework was challenging but very informative. Thank you