

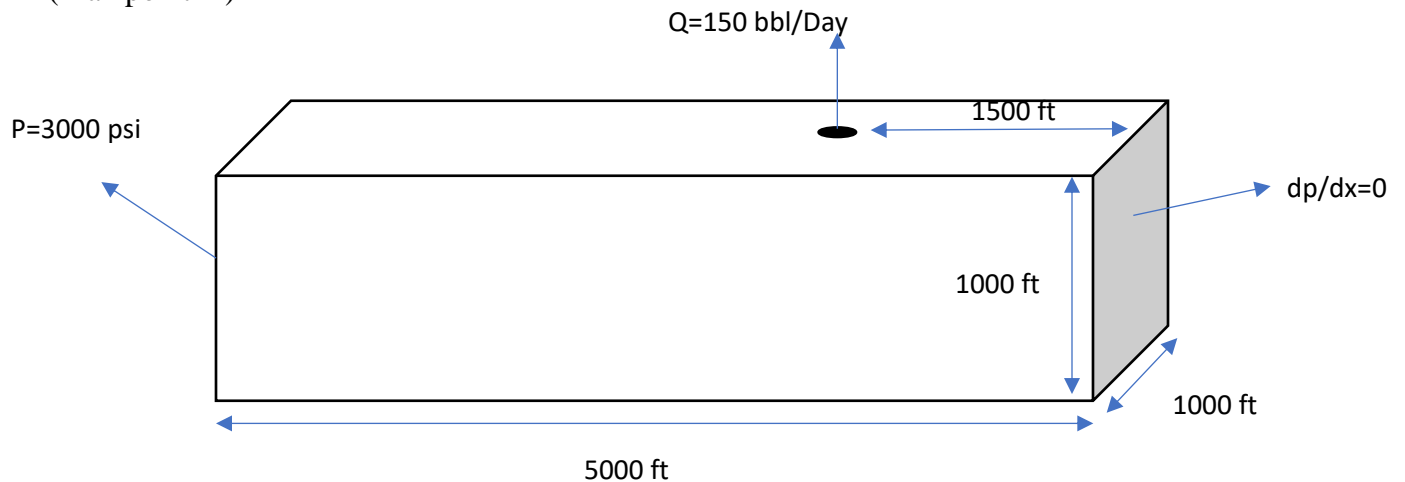
Reservoir Simulation
Homework #3
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Problem: For a 1D reservoir with the block center grid system, obtain the pressure profile during the reservoir life. (Using at least 5 time steps and 5 grids)

For the discretization of transmissibility, assume the following method and compare them.

- Constant Transmissibility (independence of pressure)
- Explicit Method
- Linearization Method
- Extrapolation Method
- Simple Iteration Transmissibility

(Optional) Write a MATLAB code to solve the problem for the any number of time steps and nodes using the above methods and then check the stability condition for the explicit scheme. (Max point=1)



$$B_l = \frac{1}{1 + c(P - P_i)}$$

$$c = 3.8 \times 10^{-6} \frac{1}{psi}$$

$$k = 6 md$$

$$\varphi = 0.15$$

$$P_i = 3000 psi$$

$$\mu = 10 cp$$

$$Reservoir\ life\ time = 1\ Day$$