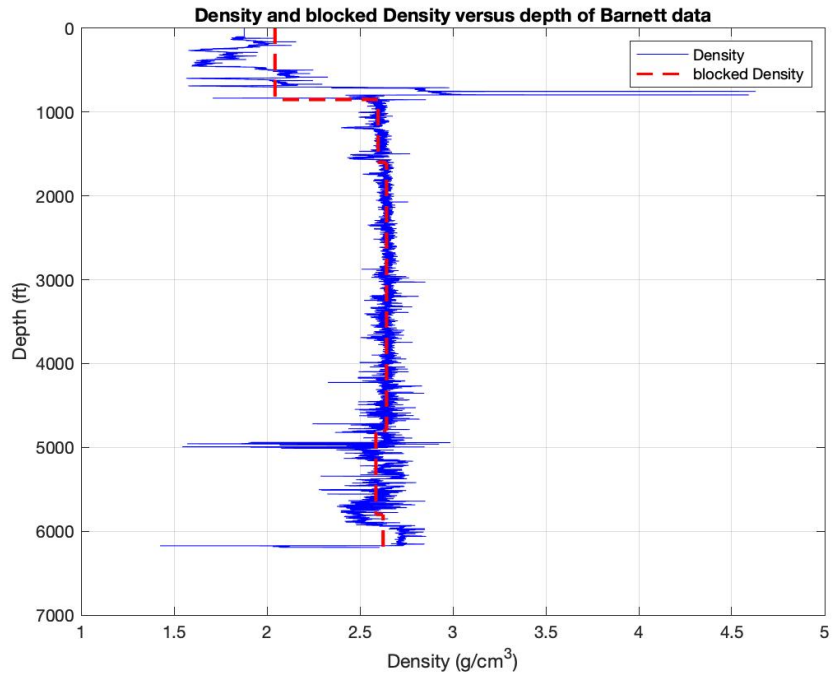
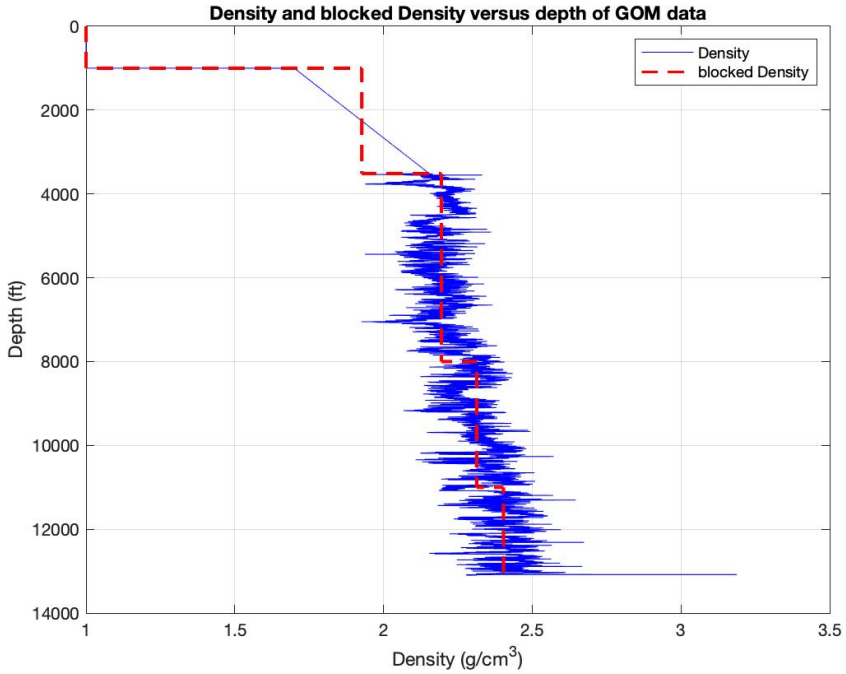
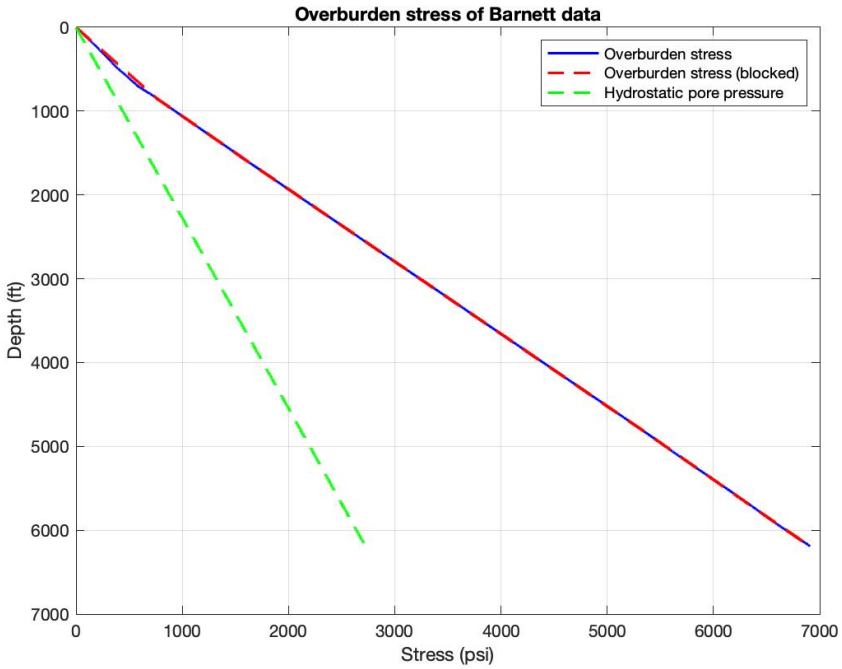
I. Compute the overburden stress and the overburden gradient

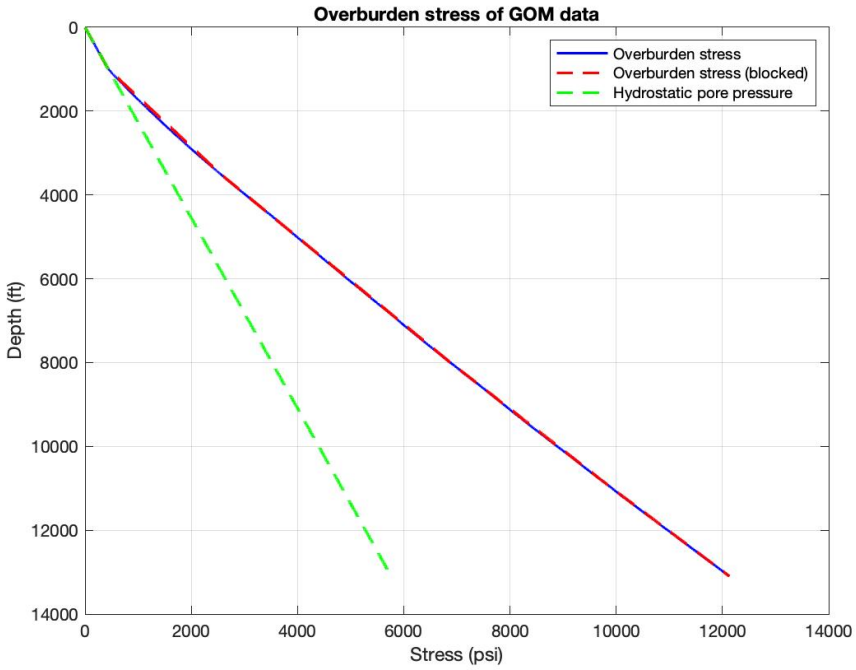
a. Plot density versus depth for each dataset.
b. Divide the density profiles into 5 blocks.



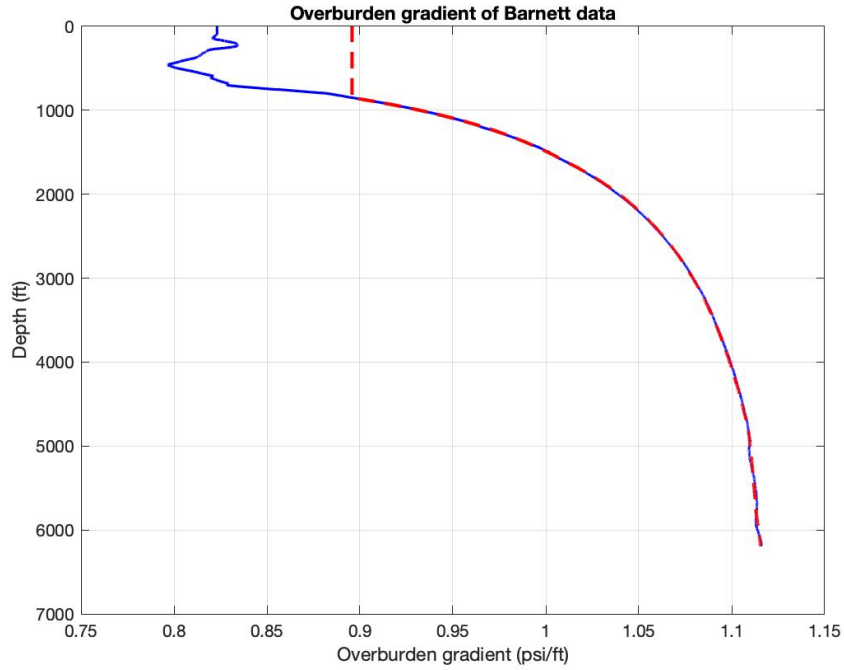


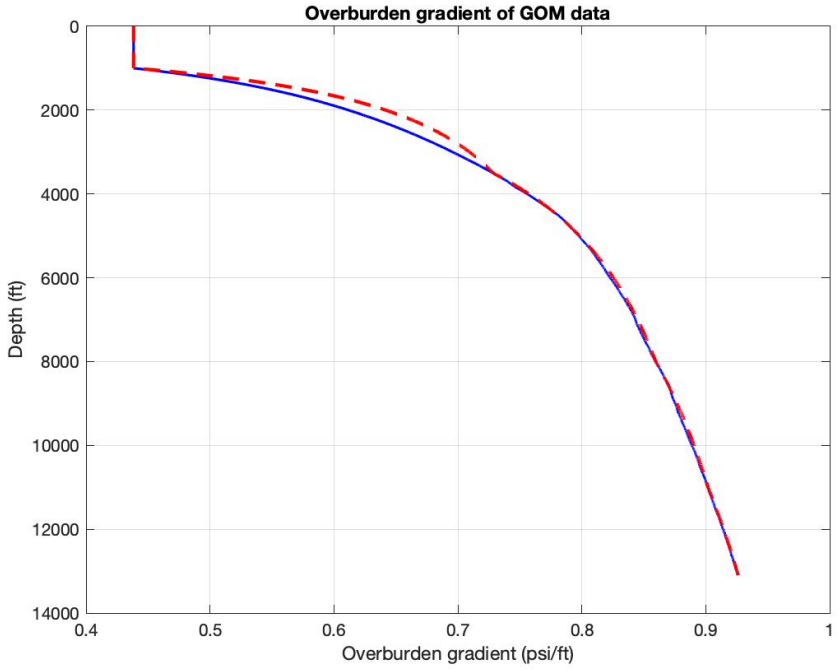
c. Calculate the overburden stress.





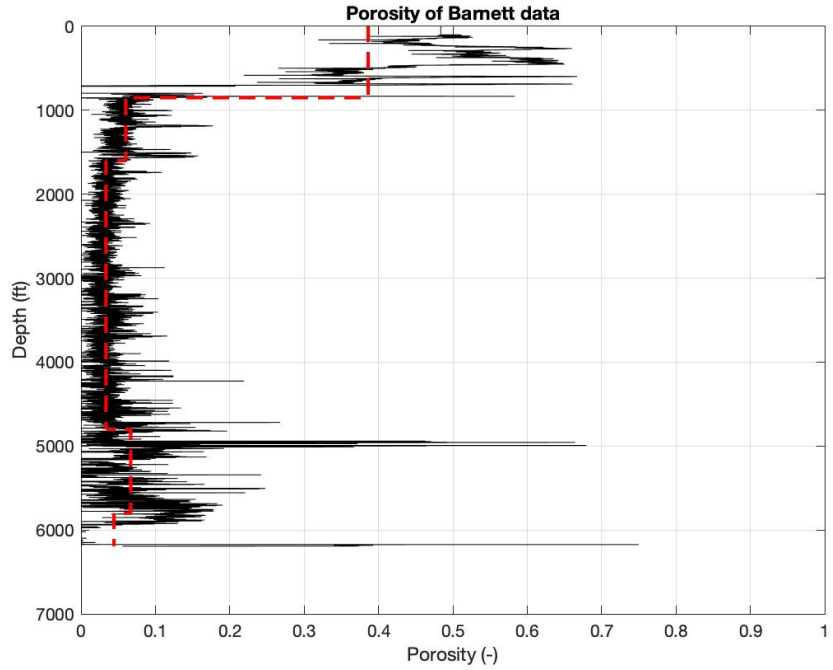
d. Calculate the overburden gradient (overburden stress divided by the depth).

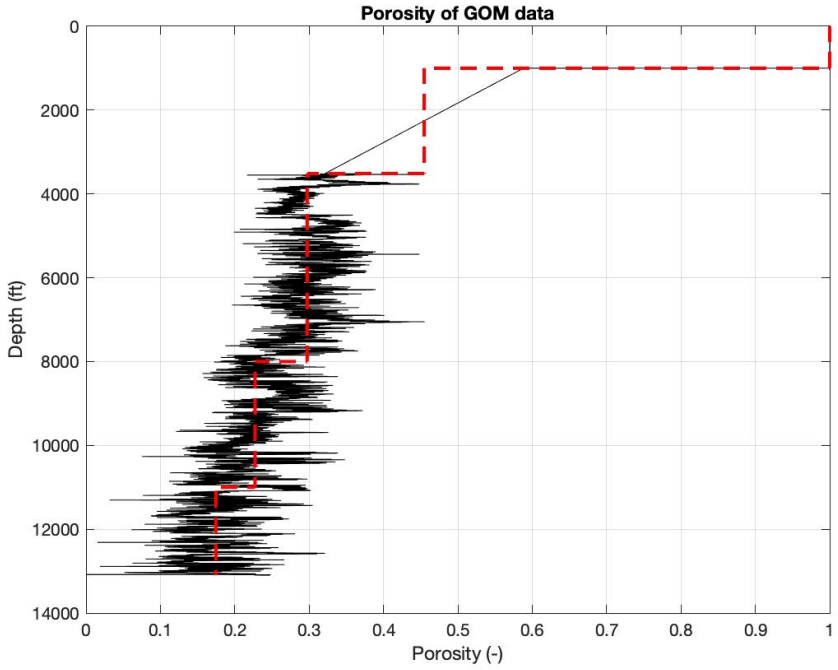




II. Compute porosity from the density measurements

a. Plot porosity versus depth for each dataset





III. Answer the questions

Question 1: Density Profiles

a. What is the logged density in the Barnett Shale well at 4000 ft depth in g/cc?

= 2.6606 +- 0.26606

b. What is the logged density in the Gulf of Mexico well at 8600 ft depth in g/cc?
= 2.294 +- 0.2294

Question 2: Overburden Stress Profiles

a. What is the overburden stress in the Barnett Shale well at 5000 ft depth in psi?
= 5547.4 +- 554.74

b. What is the pore pressure in the Barnett Shale well at 5500 ft depth in psi?
= 2420 +- 242

c. What is the overburden stress in the Gulf of Mexico well at 10000 ft depth in psi?
= 8887.9 +- 888.79

d. What is the hydrostatic pore pressure in the Gulf of Mexico well at 7500 ft depth in psi?
= 3300 +- 330

Question 3: Overburden Stress Gradient Profiles

a. What is the overburden stress gradient in the Barnett Shale well at 5500 ft depth in psi/ft?
= 1.11 +- 0.0555

b. What is the overburden stress gradient in the Gulf of Mexico well at 11000 ft depth in psi/ft?
= 0.90 +- 0.090

Question 4: Porosity Profiles

a. What is the porosity in the Barnett Shale well at 5300 ft depth?
= 0.05265 +- 0.05212

b. What is the porosity in the Gulf of Mexico well at 8200 ft depth?
= 0.1976 +- 0.05928

Question 5:

>>a. A salt body affects stress orientations around it because the local orientations of the three principal stresses are determined by the surface of the salt body.<<

(x) True
( ) False

[explanation]
The presence of salt bodies re-arranges the orientations of stresses around it as the salt body cannot support shear stresses.
[explanation]

>>b. In a typical strike slip faulting regime, hydraulic fractures propagate perpendicular to the the minimum horizontal principal stress (S_{hmin}).<<

(x) True
( ) False

[explanation]
For a typical strike slip fauling regime, the minimum horizontal principal stress (S_{hmin}) is the least principal stress (S₃). Hydraulic fractures always propagate perpendicular to the least principal stress.
[explanation]

>>c. In a typical reverse faulting regime, the lithostatic pressure is equal to which of the following?<<

(x) Least principal stress (S₃)
( ) Intermediate principal stress (S₂)
( ) Greatest principal stress (S₁)
( ) Could be either intermediate or greatest
( ) Pore Pressure (P_P).

[explanation]
The lithostatic pressure is always equal to the vertical stress (overburden) at a given depth. In case of a reverese faulting regime, the vertical stress is the least principal stress
[explanation]