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MEEG332 Fluid Mechanics II

Coding Challenge 1

Problem 1

The approach utilized to write a function to determine the dimensionless Darcy friction factor for known Re and relative roughness was to place if statements along the separating boundaries of Re and to then define the appropriate expression for f based upon which region Re falls into.

In writing a script to generate a Moody Chart, a range of Re=1E2 to 1E8 and the relative roughness values from the back of the textbook were used as boundaries and means of iteration to generate overlaying plots. f was solved for in a similar was as in the function, but now over iterated values of the Re range for each iterated value of relative roughness.

Problem 2

The approach utilized to approximate the resulting flow rate from the outlined scenario was to automate the process shown in lecture for the oil pipeline example etc. In fact, the specifications in that example were input to the script to ensure valid results were being output. An initial guess at f is made, then a value for v was found from that and from utilizing other info available in the problem, then a Re value is calculated from v and using the Moody chart (or previously defined function) you can obtain a refined f value. Iterate this process until satisfactory approximation.

