

Western University

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Assignments

Data Science for Civil Engineers: Geotechnical
Applications

2023

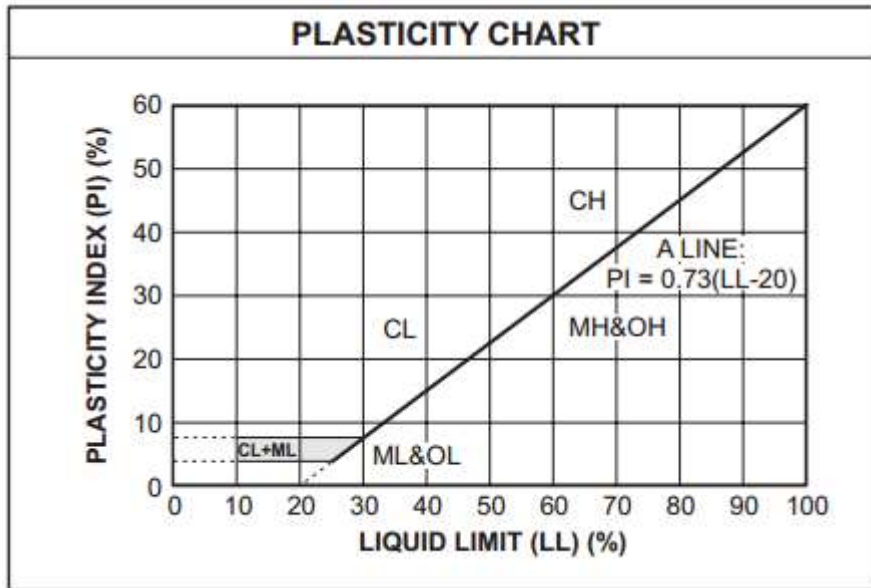
Assignment 1 - Introduction

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Follow this and additional works at: https://ir.lib.uwo.ca/wloer_lecture_datasci_assignments

CEE 9730/4420 Assignment 1

- 1) Load in the "CLAY_10_7490_TC304.csv" file using pandas. How many soils are described in the database? How many are associated with an undrained shear strength S_u from **any** kind of test? (1 point)
- 2) Plot the liquid limit and plasticity index of the soils as a scatter chart. Generate a column corresponding to whether the soil is MH, ML, CH, CL based on this scatter plot and the USCS classification chart. How many soils are in each category? (1 point)



(from <https://www.aboutcivil.org/unified-soil-classification-system>)

- 3) Plot the histogram of S_u for each soil type based on Q2, taking the average of multiple types of S_u tests if applicable. Are these data normally distributed? If not, what would be a reasonable distribution to use? (1 point)
- 4) Plot the histogram of the overconsolidation ratio (OCR). Are there any unexpected anomalies in this data? What statistical distribution best describes this histogram? Estimate the mean and standard deviation of the OCR and indicate these on the plotted histogram (2 points)

Figures are expected to be plotted in python with all axes labelled and legend included where multiple data series are presented.