Data Science
Lab Exercise (Week 1)
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1. Go through Python tutorial https://docs.python.org/3/tutorial/. Specially focus on List / Input Output

2. Determinant D of a quadratic equation is defined as $b^2 - 4ac$. Write a program in python that takes three inputs a, b, and c from the user. Then calculate Determinant D and print it. Then find the real roots according to following three cases.

   a. If D is positive, then print the following two real roots

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

   b. If D is 0, then print only one real root, $\frac{-b}{2a}$

If D is negative, then print "Only complex roots!"

3. Write a python function, called **smaller**, that computes the number of elements in an array of integers **x** of size **s** that are strictly less than a given number **n**.

   Example:
   x = {13, 56, 21, 45, 20, 43, 12, 43, 6}
   smaller(x, 9, 21) returns 4 (13< 21, 20 < 21, 12<21, 6<21)
   smaller(x, 9, 20) returns 3 (13< 20, 12<20, 6 < 20)

4. With a given list [12,24,35,24,88,120,155,88,120,155], write a program to print this list after removing all duplicate values with original order reserved.

   Hints:

   Use set() to store a number of values without duplicate.

5. With two given lists [1,3,6,78,35,55] and [12,24,35,24,88,120,155], write a program to make a list whose elements are intersection of the above given lists.

   Hints:

   Use set() and "&=" to do set intersection operation.