Purpose

Understand and use the various data types and math operations

* signed and unsigned values
* floating point and integers
* precision, range and storage requirements
* comparing different types and precision
* operator precedence

Assignment

Write Python programs that perform the following functions.  Each program must be executable with a main function.

1. **hw03a.py**Solves the quadratic equation for an equation of the form ��2+��+�=0
   1. Write a function quadratic(A,B,C) that takes the coefficients and returns the solutions as a tuple.
      1. it should work with real and complex solutions
   2. Call that function and print your answer in the following format (print 3 decimal places of precision)
      1. "X=<positive value> or <negative value>\n"
      2. Test it with the values
         1. A=1.7 B=5 C=2
         2. A=1 B=1 C=1
2. **hw03b.py** Creates arrays to hold 5 student names and 5 grades.  Fill them in from this table (in order):

|  |  |
| --- | --- |
| Larry | 75 |
| Moe | 85 |
| Curly | 65 |
| Sleepy | 48 |
| Happy | 98 |

* 1. print the name and score of all students in alphabetical order by name
     1. <name>\t<grade>\n
  2. print the name and score of all students in the order or increasing grade
     1. <name>\t<grade>\n

 Check this web page for guidance [https://realpython.com/sort-python-dictionary/Links to an external site.](https://realpython.com/sort-python-dictionary/)

1. **hw03c.py**  The current through a diode is given by ��=��[���(�⋅���⋅�⋅�)−1]  where:
   * 1. n=ideality constant,
     2. k=Boltzmanns constant = 1.381⋅10−23
     3. T is temperature in Kelvin
     4. q is the electron charge = 1.602⋅10−19
   1. Write a function diodeCurrent(Vd,Is,T,n) which returns the diode current.
   2. print the results as:  "Id = <Id> for vd = <vd><\n"  in scientific notation with 3 places of precision after the decimal.
   3. Test it with n=1,T=300,Is=10−10 and Vd=0, 0.7, and 1 Volts.
2. **hw03d.py**  Given two equations:  ��+��=������+��=� where A-F are variables, write a program that solves the equations in general.
   1. Write a function solve(A,B,C,D,E,F) which returns the solution as a tuple (x,y)
   2. write a main function that tests it on A=2, B=5, C=7,D=4,E=-6,F=12
      1. print the result as "x = <x>\ty = <y>\n" as floats with 2 decimals