IE 555 – Programming for Analytics

Homework #5 – Working with NumPy

Due Date: To Be Determined

Sometimes source data aren't in a format that we would've designed. The purpose of this assignment is to help you practice using numpy and to work with poorly formatted data.

Assignment Details

You need to write a function that calculates some statistics about student grades in a particular course.

- Your function should be in a Python script named `UCASEUBUSERNAME_grades.py`; replace `UCASEUBUSERNAME` with your UB user name in all caps.
- Within this python script, you should write a function named `gradeInfo`.
- The `gradeInfo()` function will be called as follows:
  `gradeInfo(filename, numExams, hwWeight)`
  - See `UCASEUBUSERNAME_grades.py` for information about these three input parameters.

Your `gradeInfo()` function should do the following:

1. Import the given .csv file. See `grades_example.csv`, which describes the structure of input files.
2. Return the following five (5) pieces of information, **in this order**:
   (a) Find the average of HW1.
   Return this as a scalar value in the range [0, 100].
   (b) Sort the grades in descending order for HW2 (best grades first).
   Return as a (n x 2) numpy array. There are n rows, where each row is a student. The first column returned should be the student ID, the second column is the score on HW2 (as a score in the range [0, 100]).
   (c) Find the students who made 90 or above on both HWs 1 and 3.
   Return as a 1-dimensional numpy array, just containing ID numbers.
   (d) Find the number of students who made 80 or below on HW1 and 90 or above on HW2.
   Return as a scalar integer.
   (e) Each homework is equally weighted. Find each student's current average grade, rounded to 1 decimal place, in the range [0, 100].
   Return as a (n x 2) numpy array. There are n rows in the source data, where each row is a unique student. The first column to be returned is the student ID, the second column is the weighted score in the range [0, 100].

- For example, suppose a student had the following scores:
  Homework: 9/10, 4/5, 35/50. Exam1: 85/100

  If hwWeight = 0.4, the student's average grade is (((9/10 + 4/5 + 35/50)/3) * 0.4 + ((85/100)/1) * (1 - 0.4)) * 100 = 83.0