**HW2-CIS492/DSA230, 2022 Fall**

Due time: 11:30 pm, Nov 5th, 2022

**Submissions should be written in Python 3 (25 points per question, 100 points in total). Please zip your four .py files into one single file and then submit the single zipped file to BlackBoard system. You are required to use NumPy functions in this homework. Solving the questions by traditional loops (e.g., while, for) will receive the half score only.**

1. For question 1, please firstly use **numpy** to generate a 200x200 matrix named **X**, where each element in **X** is a **random** float number between -200 and 1000, and then please print the statistical data of **X**: minimum value, maximum value, average value, standard deviation value. Filename: statistical.py

2. For question 2, please firstly use **numpy** to generate two 5x5 matrices named **X and Y**, where each element in **X and Y** is a **random** float number between 0 and 1, and then compute and print the element-wise multiplication and dot product of **X and Y**. Filename: multiply.py

3. For question 3, please firstly use **numpy** to generate a 20x30 matrix named **X**, where each element in **X** is a **random** float number between -20 and 100, and then use **Softmax** method to normalize each element in **X** to be the range [0, 1]. Finally, please print the normalized **X** and also print the summation of **X** which should be very close to 1. Filename: softmax.py

More about Softmax: <https://en.wikipedia.org/wiki/Softmax_function>

4. For question 4, please firstly use **numpy** to generate two 20x30 matrixes named **X** and **Y,** where each element in **X** and **Y** is a **random** float number between 20 and 100. Please use **numpy** to compute and print the **L1 distance** and **L2 distance** between **X** and **Y**. Filename: distance.py