To calculate the NMED, you have to simulate your designs (which is explained in "Digit_DNN.pdf") first. The first design would be the exact design (either by implementing a signed version of the given code or by using the unsigned multipliers and converting the inputs and outputs). The second design would be approximate design. Then you must repeat the simulation for the approximate design. Here is an example:

For example, for layer 5 (fc_1), the size of the input feature map is 196. Accordingly, the number of rows written in "I_Dig_5_B_8.txt" is 196. The size of the weights for this layer is 128×196 which means that this layer has 128 filters. The "W_Dig_5_B_8.txt" has 128×196 rows, that every 196 rows belong to a filter. In more detail, the output of this layer is the summation of the element-wise multiplication of every 196 rows of "W_Dig_5_B_8.txt" and "I_Dig_5_B_8.txt". Students have to create an output file that has 128 elements (each row is the summation of the element-wise multiplication of each filter in "W_Dig_5_B_8.txt" and the input feature map in "I_Dig_5_B_8.txt"). The same thing is true for other fully-connected layers. The input and weights of different fully connected layers are written in separate files.

So, for the example above, you are expected to have to output files (one is the output of the exact design and the second one is the output of the approximate design) that both have 196 rows and 1 columns (like a vector with 196 elements).

From here you can use any software to calculate NMED (like Excel. Matlab,…):

you are expected to find a third vector which is the element-wise subtraction of the approximate vector and the exact vector (let's call it difference vector). Then you will find:

E=mean(abs(difference vector))

Then to calculate NMED, you divide The value (E) by the maximum value of the abs(**Error** vector).