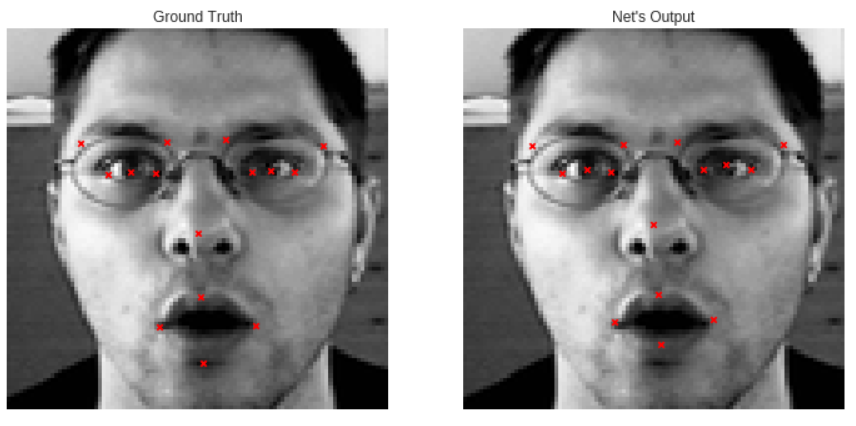
**Tel Aviv University**

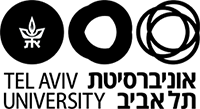
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**Computer Science**

**Deep Learning**

**Exercise 1**





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**Question 1: XOR network**

Results are attached as Q1\_results.txt

Code is attached as **\ Q1\q1.py**

Results are attached as **\ Q1\_results.txt**

Loss function values in last epoch:

Train: 0.000000

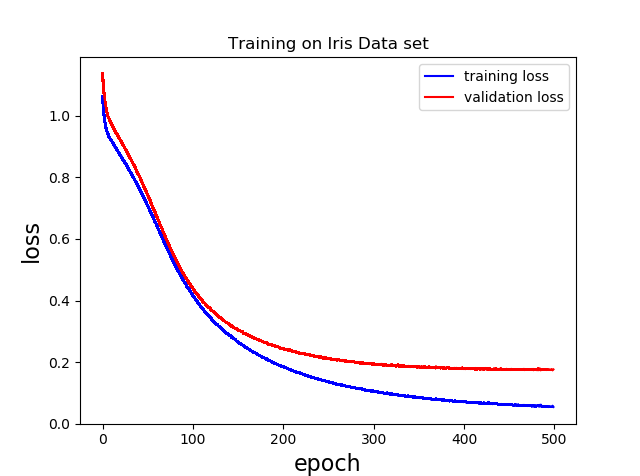
Test: 0.000000

**Question 2:ReQU activation**

Code is attached as **\ Q2\q2.py**

Results are attached as **\ Q2\_results.png**

Convergence plot:



Loss function values in last epoch:

Train: 0.176671

Test: 0. 047522

Network accuracy: 100%

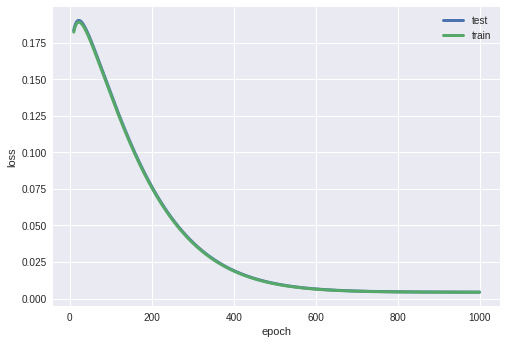
**Question 3:Facial Keypoint Detection**

Question 1: Data normalization

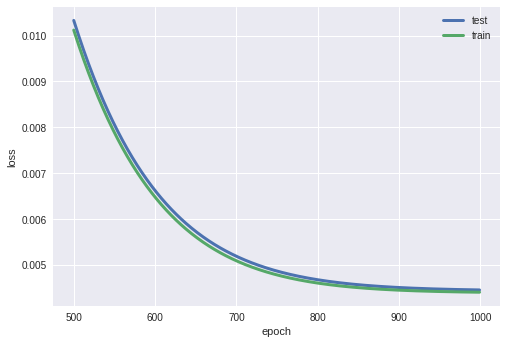
We have used the code in the suggested tutorial to load and normalize data.

Question 2: Fully connected neural network

Code is attached **\Q3\q3\_faces\_a.py**

The presented plot is the cost function value for test and train after each epoch, starting from epoch 10

A closer look (after 500 epochs):



Loss function values in last epoch:

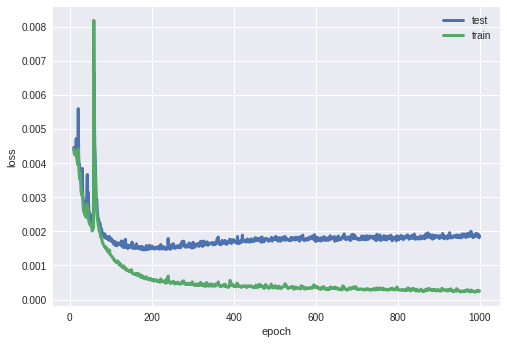
Train: 0.004409

Test: 0.004459

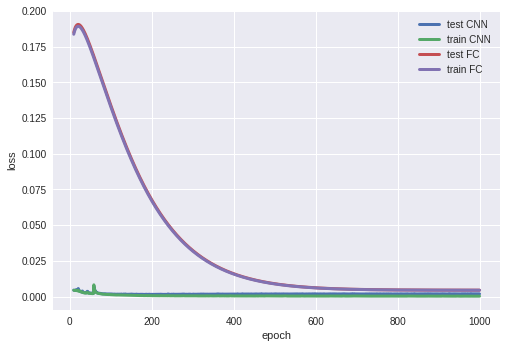
Question 3: Convolutional neural network

Code is attached as **\Q3\q3\_faces\_b.py**

Convergence plots:

Only CNN:

With old version:



Loss function values in last epoch:

Train: 0.001875

Test: 0.000252