This Assignment contains 2 part, practical and non practical.

For the first part we have uploaded a jupyter notebook (.ipynb) file with this pdf, please complete the code in the each cell which provided for that question.

We provided 20% extra points for those who complete the entire assignment.

Due Date : 1399 – 9 – 10 23:59:00

Late policy:

The penalty is 10% for each additional late day.

If you have any question, feel free to contact with us via:

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1) In this Question we want to discuss about the gradient descent algorithm. (20 pts)
   a. First Completely Explain the principle of this algorithm, Accompany your explanation with a diagram.
   b. Calculate elements of the algorithm for this cost function:

$$J(\theta) = \frac{1}{2}\sum_{i=1}^{q}(h_\theta(x^i) - y^i) \;\; where \; h(x) = \tanh(w^T x + b)$$

2) Can you Represent the following Boolean function with a single logistic threshold (a single unit from a neural network)? If yes show the weights If not explain why not in 2-3 sentences. (10 pts)

A	B	f(A,B)
1	1	0
0	0	0
1	0	1
0	1	0

3) In this question you need to open the jupyter notebook file, and complete it. (Hand-coding a network). (20 pts)

4) In this question you will learn to implement MLP from scratch. you are not allowed to use any extra libraries (just basic libraries like numpy, math,..). Please open the jupyter notebook file and complete the MLP section. (50 pts)