

Islamic University of Technology (IUT), Department of Computer Science & Engineering
CSE 4621: Machine Learning, Quiz#02, Marks: 15, Time: 30 Minutes

1. Show that for a logistic function σ , the following equation is true. [Marks: 04]

$$\frac{d\sigma(z)}{dz} = \sigma(z)(1 - \sigma(z))$$

2. The NAND function (NOT AND) returns false (0) only when both of the arguments are true (1). Otherwise, it returns always true (1). Do you think it is possible to implement this function with a single logistic regression unit (i.e., neuron of an artificial neural network)? Justify your answer. Roughly design the weight coefficients values based on intuition (Not need to apply Gradient Descent technique) [Marks: 05+01]
3. “Early stopping (i.e., before reaching the global optimum) an iterative optimization method such Gradient Descent is a form of Regularization” – Do you agree or disagree with this statement. Explain why. [Marks: 05]