

# Artificial Intelligence (CS 571)

## Assignment-7: Neural Network

(Read all the instructions carefully & adhere to them.)

**Date: 9-11-2018**

**Deadline: 12-11-2018**

Design and train a neural network that computes

- a. The functionality of XOR operation.
- b. News Headlines classification.
  - i. Input to the network should be the unigram vector that was computed for assignment-6
  - ii. Output layer should have five neurons (i.e. one neuron for each category). Use “Softmax” as activation for the output layer. Represent output categories as
    1. 1 0 0 0 0 → Business
    2. 0 1 0 0 0 → Comedy
    3. 0 0 1 0 0 → Sports
    4. 0 0 0 1 0 → Crime
    5. 0 0 0 0 1 → Religion
  - iii. Network must have at least one hidden layer (can be more as well).

### **Instructions:**

- a. For implementation, you can use any library.
- b. Try with different **loss functions**(e.g. **mse, cross-entropy**) / **activation function** (e.g. **sigmoid, tanh, relu**) / **optimizer** (e.g. **gd, sgd, adam**) and observe
  - i. Weights
  - ii. Loss
  - iii. Accuracy
- c. For news headline problem, try adding bigram, trigram and pos tag features along with unigrams.