Assignment-2 (Full Marks: 10) To be submitted by 9th April

1. In the class we have already discussed RNNs for language modeling. Can you think about applying ConvNets/CNNs for the same?

    a) Explain clearly how the inputs will be processed.

    b) How we will apply filters?

    c) Will there be any advantages if we use ConvNets over RNNs? Explain.

2. What is the significance of Markov Chain Monte Carlo methods in Machine learning? What are some of the algorithms that are used to draw samples while implementing an MCMC sampling? For at least one of the algorithms, explain, with examples, how it works. State one practical problem which can be solved to a good approximation using MCMC simulation. Explain the gross steps.

    (Any paper discussing the above can be referred to. Lucid description of what the paper is about should be rewritten in your own words and submitted - not "copy-paste" from the paper. Coding / implementation is not required).

3. Go through the following three papers on building Language models

    a) Generating Sequences With Recurrent Neural Networks: https://arxiv.org/pdf/1308.0850.pdf

    b) LSTM-based Language Models for Spontaneous Speech Recognition: https://www.researchgate.net/profile/Ivan-Medennikov-2/publication/306064228_LSTM-Based_Language_Models_for_Spontaneous_Speech_Recognition/links/5a019185a6fdcc232e2bfe80/LSTM-Based-Language-Models-for-Spontaneous-Speech-Recognition.pdf

    c) Faster and Smaller N-Gram Language Models: https://www.aclweb.org/anthology/P11-1027.pdf

    Discuss the advantages and limitations of each of the approaches.