CAP 6640 – Natural Language Processing
Homework 3
February 21, 2019
Due: in 5 days (due by Feb 26, 2019: firm).
Preferred typesetting system LaTeX

Answer all of the following questions. Keep in mind the following instructions: individual work, cite all references, document your code, type in all answers, and in mathematical expression, use standard notations.

1. What is language modelling? Give two possible use case.

2. Explain n-grams technique with an example. List two limitations and possible solutions.

3. Explain fixed window language model mathematically. Explain the limitations, their foundations and how it improves n-gram language model.

4. Explain the RNN language model (including training and backpropagation) mathematically and list 2 advantages and 2 disadvantages.

5. Explain vanishing and exploding gradient problem. Explain how LSTM and GRU solve the vanishing gradients problem and compare these two methods.