CS 224d Problem Set #1

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1   Problem 1 - Softmax

(a) Softmax is Invariant to Constant Offset $softmax(x) = softmax(x + c)$
$softmax(x) = \frac{e^{x_i}}{\sum_j e^{x_i}}$

$softmax(x + c) = \frac{e^{x_i+c}}{\sum_j e^{x_i+c}} = \frac{e^{x_i}e^c}{\sum_j e^{x_i}e^c} = \frac{e^{x_i}e^c}{e^c \sum_j e^{x_i}} = \frac{e^{x_i}}{\sum_j e^{x_i}} \blacksquare$

2   Problem 2 - Neural Network Basics

3   Problem 3 - Word2Vec

4   Problem 4 - Sentiment Analysis