

Structured Neural Networks for NLP: From Idea to Code

Graham Neubig



Carnegie Mellon University

Language Technologies Institute

Examples:

<https://github.com/neubig/yrsnlp-2016-examples>

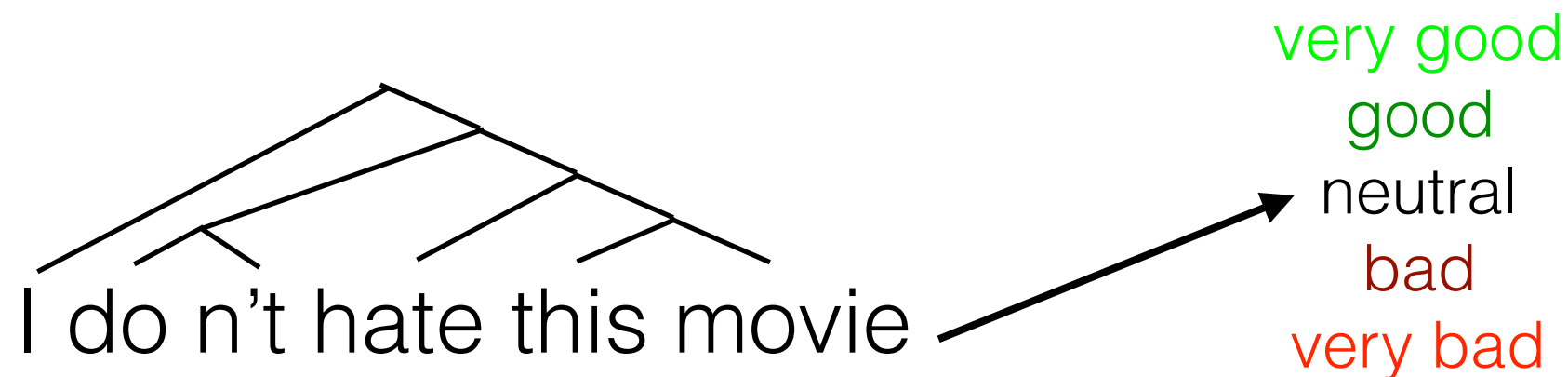
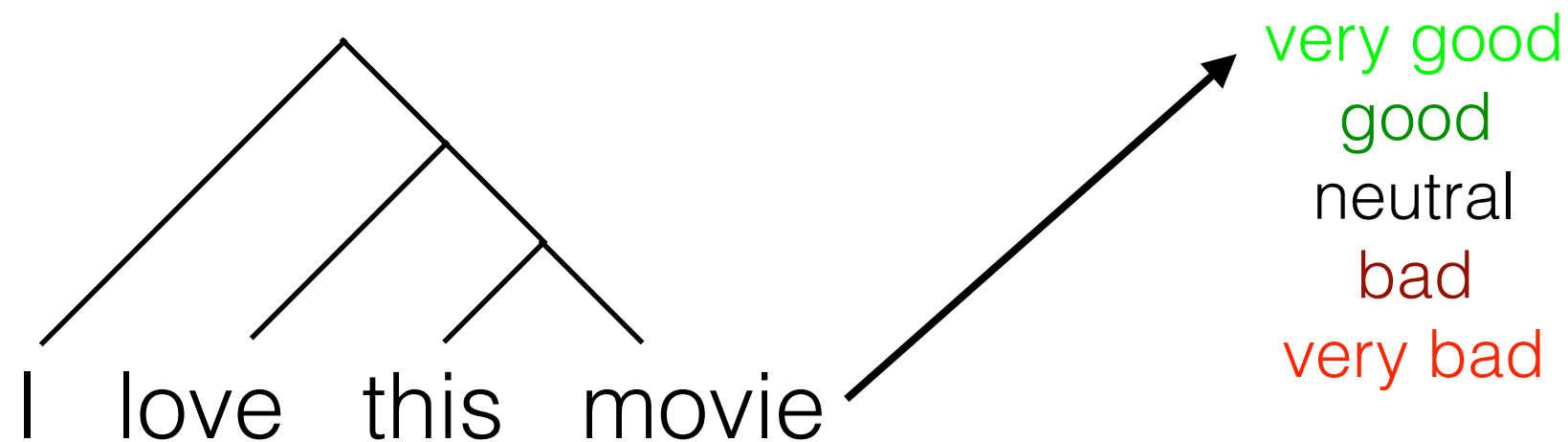
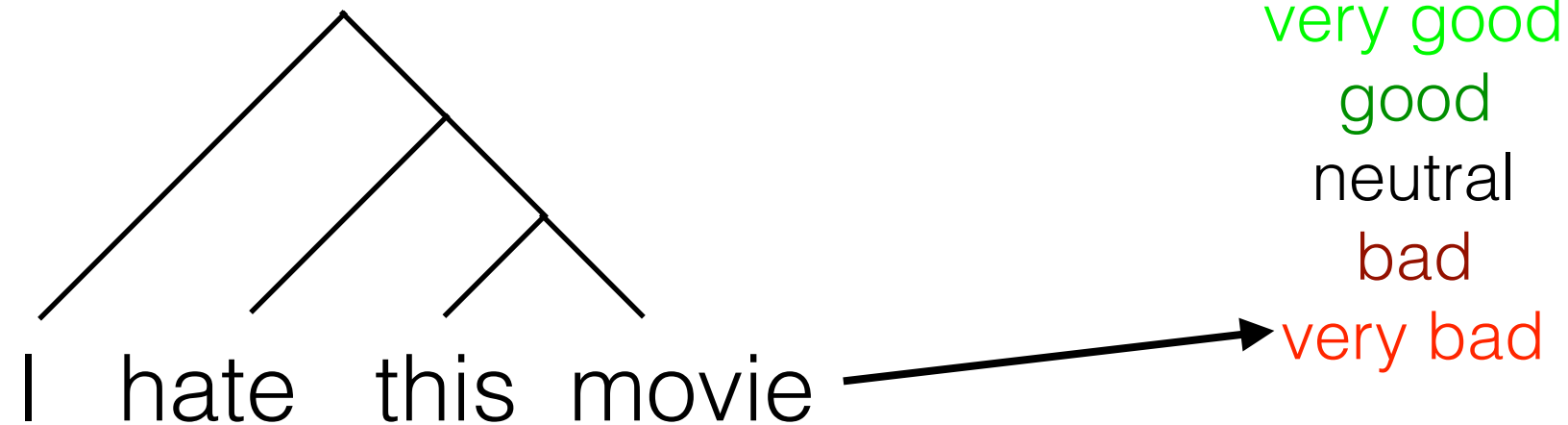
Neural Networks and Language

- Neural networks give us new tools to process data: images, speech, text
- We want to go from idea to code quickly
- I will show some examples from DyNet:
 - **DyNet is intuitive**, program like you think (c.f. TensorFlow, Theano)
 - **DyNet is fast for complicated networks** on CPU (c.f. autodiff libraries, Chainer)

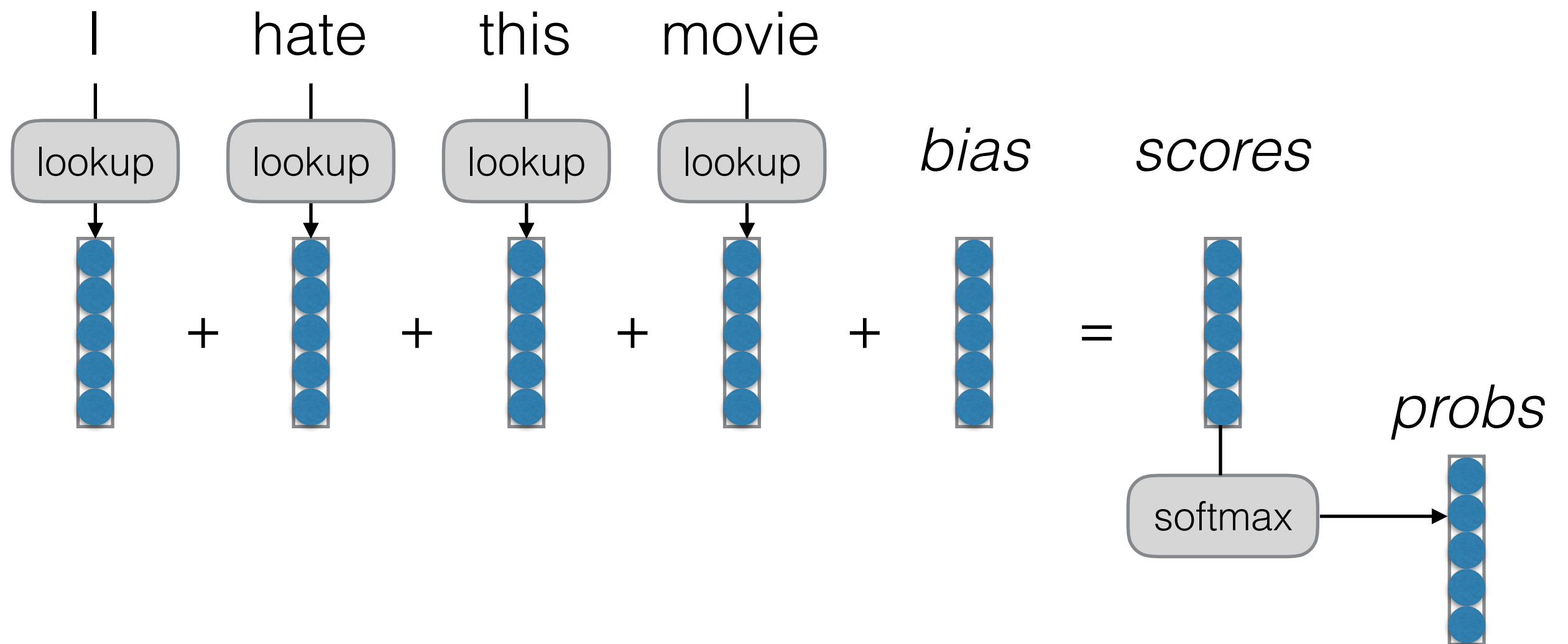
Basic Idea

- Create a model
- For each example
 - **create a graph** that represents the computation you want
 - **calculate the result** of that computation
 - if training, perform **back propagation and update**

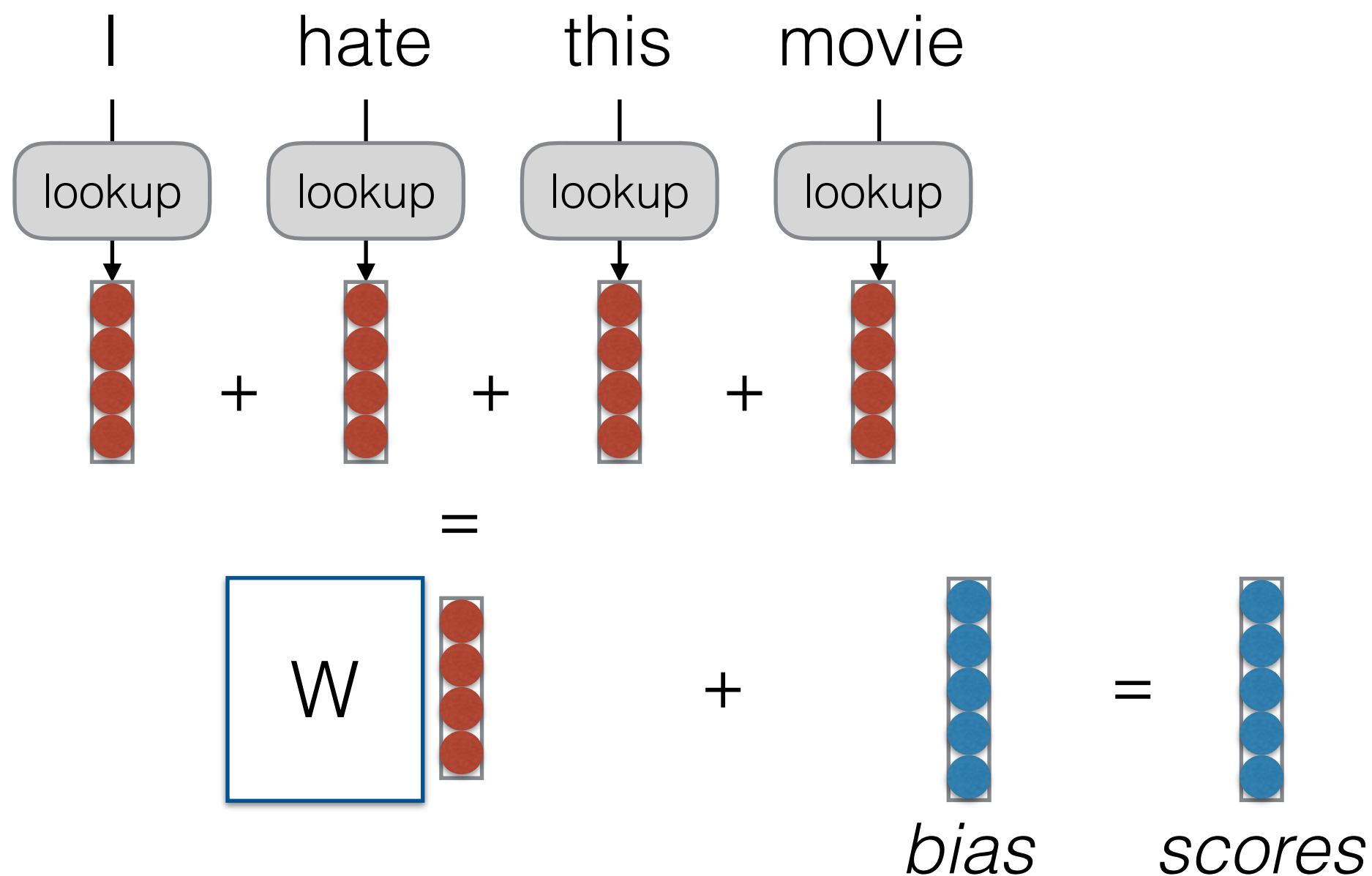
Example Task: Sentiment



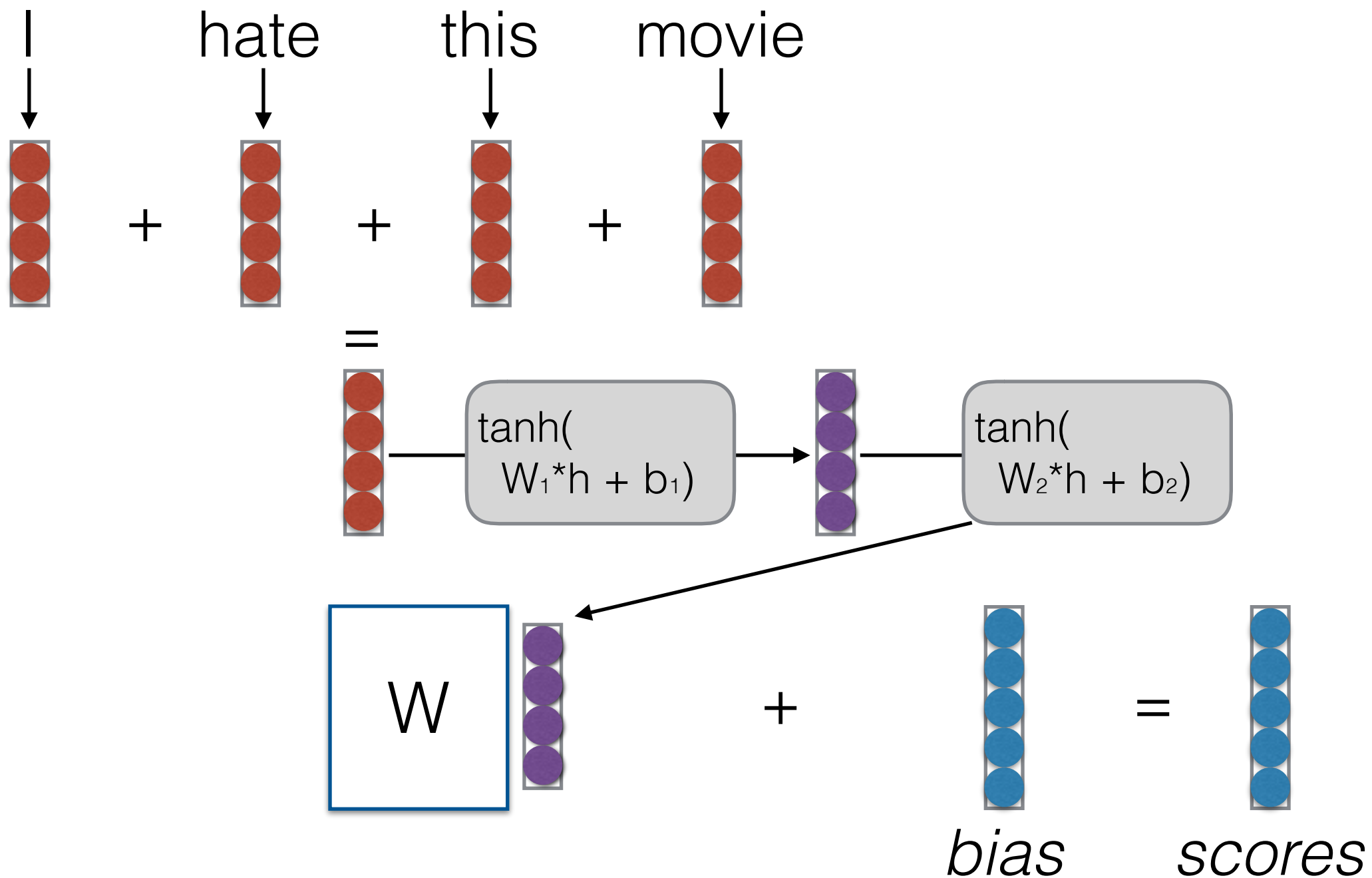
Bag of Words (BOW)



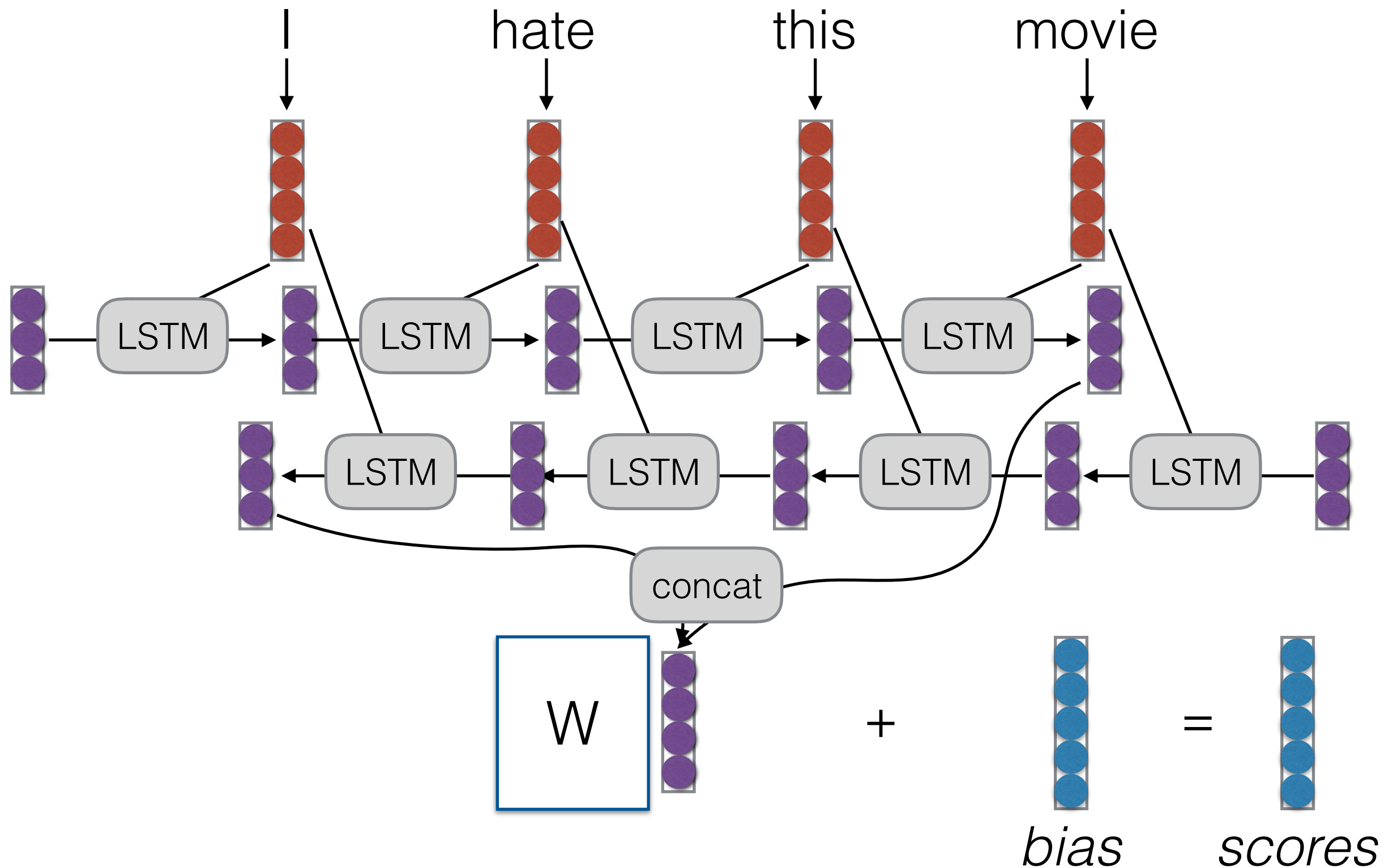
Continuous Bag of Words (CBOW)



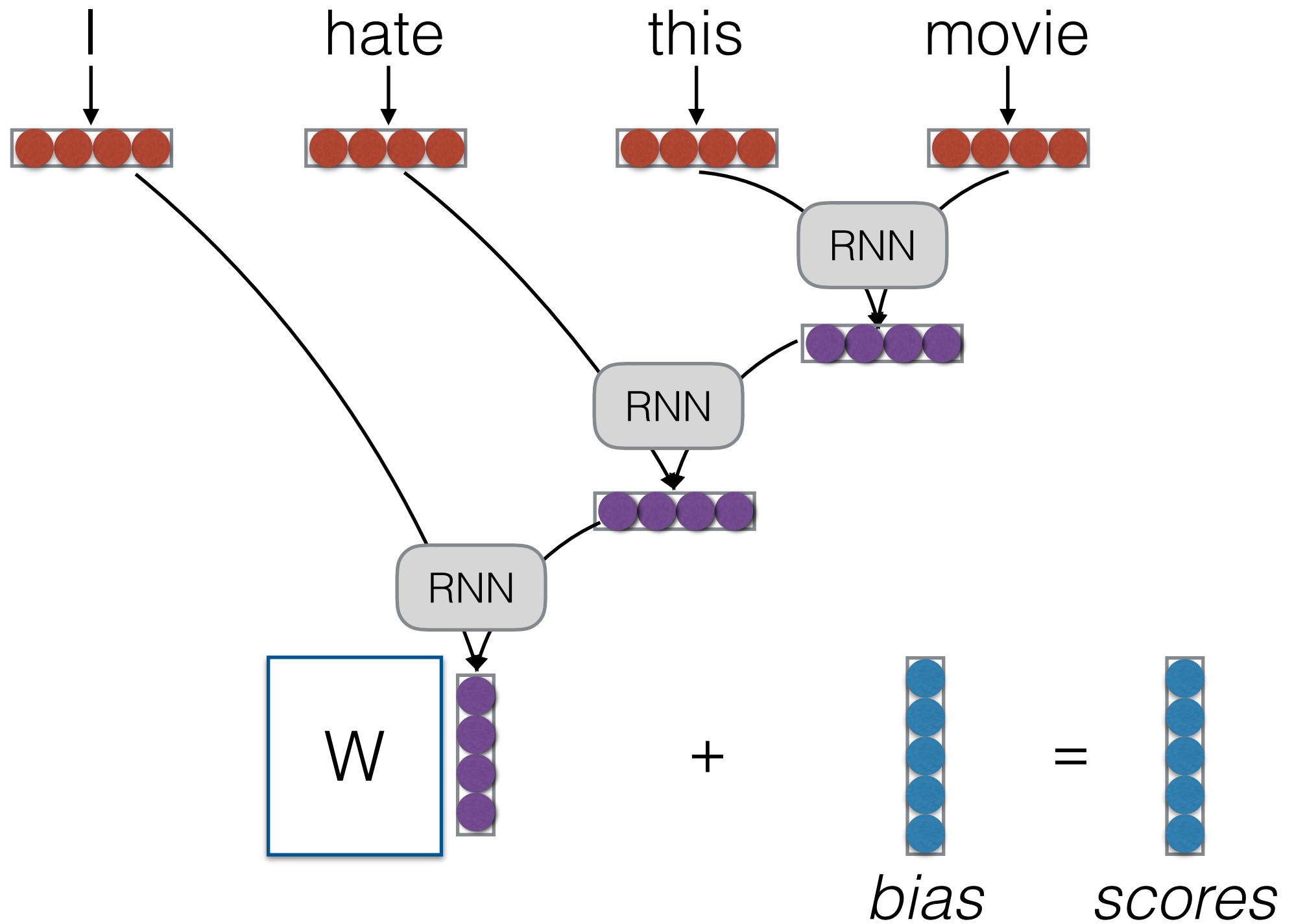
Deep CBOW



Bi-directional LSTM



Tree-structured RNN/LSTM



Questions?