

LING3804: Study Guide 1

Practices:

1-20. review all practices in Lecture Notes 1-7

Vocabulary: (terms are grouped by lecture notes document and by related area)

Lecture Notes 01:

- in no more than a sentence, what do these phrases mean?: artificial intelligence, machine learning, neural network, large language model
- what are these in the mathematical model?: neuron activations, synaptic weights, linear function, threshold function
- what do these represent in biology?: neuron activations, synaptic weights, linear function, threshold function

Lecture Notes 02: in no more than a sentence, what do these phrases mean?

- finite-state automaton
- generative model, discriminative model
- probability, sample space, outcome, event, unconditional probability, conditional probability, joint probability
- hidden Markov model (HMM), transition, emit
- localist, distributed
- vector, orthogonal, superposition, component, state

Lecture Notes 03: in no more than a sentence, what do these phrases mean?

- associative memory, cue, target
- matrix

Lecture Notes 04: in no more than a sentence, what do these phrases mean?

- grammar rule, tree structure, primitive category, type-combining operator

Lecture Notes 05: in no more than a sentence, what do these phrases mean?

- convergence, softmax, loss, rectified linear unit, autoregression

Lecture Notes 06: in no more than a sentence, what do these phrases mean?

- backpropagation, Jacobian matrix, matrix chain

Lecture Notes 07: in no more than a sentence, what do these phrases mean?

- similarity, cosine
- attention matrix, query, key, value

- in-context learning

Readings:

1. in a sentence, what do McCoy et al (2019) say about language model evaluations? in a sentence, why do they say that (give at least one reason)?
2. in a sentence, what do Bender and Koller (2020) say about large language models? in a sentence, why do they say that (give at least one reason)?
3. in a sentence, what do Piantadosi and Hill (2022) say about large language models and meaning? in a sentence, why do they say that (give at least one reason)?
4. in a sentence, what do Bubeck et al (2023) say about GPT-4? in a sentence, why do they say that (give at least one reason)?
5. in a sentence, what does McCoy (2024) say about large language models? in a sentence, why do they say that (give at least one reason)?
6. (completion credit) in a sentence, what do you think about large language models? in a sentence, why do you think that (give at least one reason)?