UCLA Samueli School of Engineering

CS161 WEEK10 DISCUSSION 1C

Danfeng Guo

Final Review

Final Review

LOGISTICS

- June 7
- 3 hrs, attend one of the 2 sessions on CCLE
- 60 T/F & MC
- Attend 10 mins earlier on Zoom and we will give the password of exam
- Topic: everything but we focus more on the contents after the midterm. Also do not forget your HWs. Refresh your memory on LISP.
- All objective questions. Questions do not depend on each other.

Final Review

SEARCH ALGORITHM

We'll test your understanding and memory on the concepts.

Eg: Evaluations of those tree-searching algorithms, heuristic functions, alpha-beta pruning,

Final Review

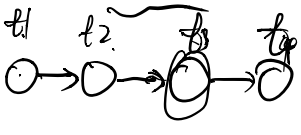
LISP

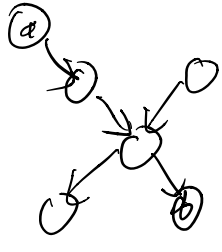
- The use of car, cdr
- The use of cons, list, append, etc
- The use of cond

Final Review

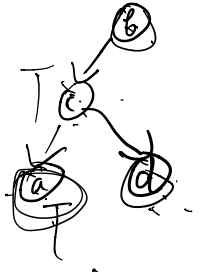
PROB THEORY & BAYESIAN NETWORK

- Basic: Joint prob & Conditional prob
- Bayes Rule
  - Decomposition of joint prob
- Var independence
  - Conditional independence
  - D-separation
    - 3 basic structures
    - D-separation in a complex graph
    - Markov





Bayesian Net



Final Review

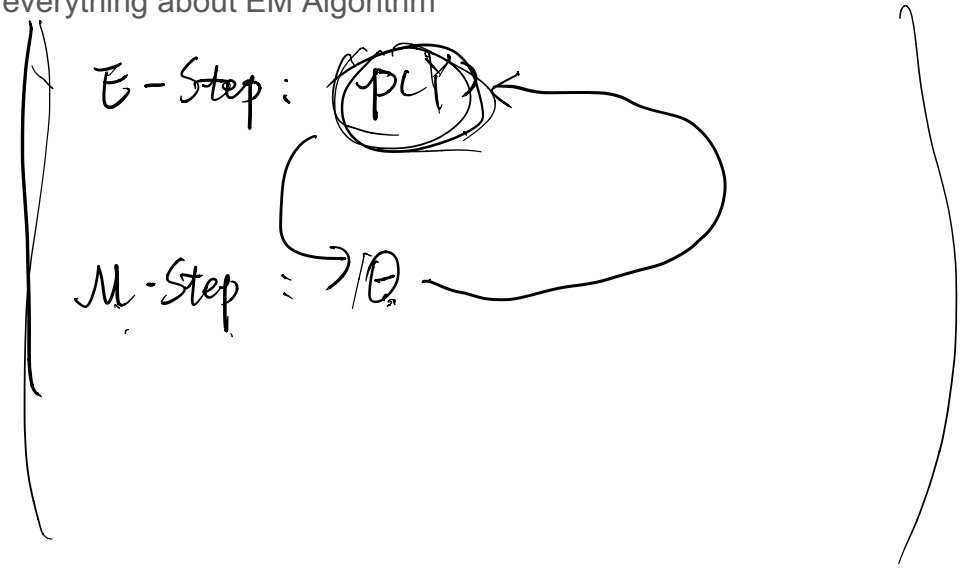
EM ALGORITHM

- What is it for?
- Understand everything about EM Algorithm

for hidden variable / unknown data

X: known
Y: Unknown

$(L(\theta; X, Y))$



Final Review

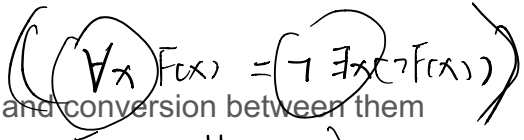
TRADITIONAL ML MODELS

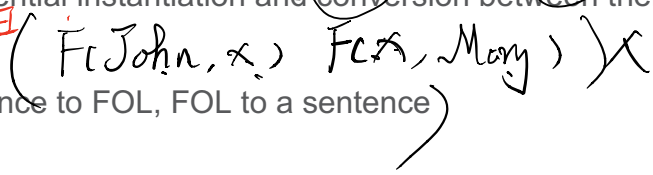
- Decision trees & Neural networks
- Capture the very basic concepts
  - What is a ‘tree’ like. How to build it. What tasks can it perform.
  - What NN looks like. What layers inside. (linear, conv, activations, pooling…)What tasks can it perform.
  - How to train
  - Some loss functions
  - Extensions on decision trees

Final Review

PL/FOL

- Resolution, Resolution, Resolution
- Basics:
  - DNF, CNF, Horn and transformation
  - Completeness, soundness
  - Entailment
- Universal & Existential instantiation and conversion between them
- Unification
- Translate a sentence to FOL, FOL to a sentence





Play with some questions

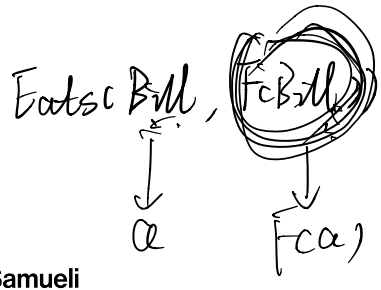
TRANSLATE TO FOL

Everything is bitter or sweet

Nobody is loved by no one

If someone is noisy, everyone is annoyed

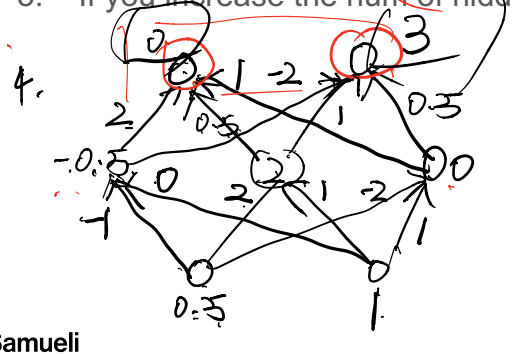
~~FOL EQUIVALENCE~~



Play with some questions

NN

1. One perceptron(linear) layer can model XOR
2. Which of the following gives non-linearity to NN
   - SGD
   - Activation
   - Convolution
3. If you increase the num of hidden layers, the test error decreases.



Q&A