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# Natural Language Processing

**Problem set 5 (Extra credit)**

1.

| | |
|---|---|
| *S* | → *3sgAux 3sgNomNP VP* |
| *S* | → *Non3sgAux Non3sgNomNP VP* |
| *3sgAux* | → *does\|has\|can\|...* |
| *Non3sgAux* | → *do\|have\|can\|...* |
| *3sgNomNP* | → *3sgNomPronoun* |
| *3sgNomNP* | → *Det SgNominal* |
| *3sgNomPronoun* | → *he\|she\|it* |
| *Non3sgNomNP* | → *Non3sgNomPronoun* |
| *Non3sgNomNP* | → *Det PlNominal* |
| *Non3sgNomPronoun* | → *I\|you\|we\|they* |
| *VP* | → *Verb (AccNP) (PP)* |
| *AccNP* | → *AccPronoun* |
| *AccNP* | → *Det Nominal* |
| *AccPronoun* | → *me\|us\|you\|him\|her\|it\|them* |

2. If we didn't group the noun phrases as,

   *Nomial → (Det) (Card) (Ord) (Quant) (AP) Nominal*

   Then we would have to make binary decisions for each one of them, leading to $2^5 = 32$ rules.

3. Thematic role labelling.

   - The door **opened**.
     FORCE: door
     RESULT: opened

   - A sinister-looking man **stood** there.
     AGENT: Sinister looking man
     THEME: stood there

   - I **was unnerved** by his silence.
     EXPERIENCER: I
     AGENT: his
     THEME: silence

- I **asked** what he wanted.
  AGENT: I
  THEME: asked
  BENEFICIARY: he

- He **handed** me a plain, brown box.
  SOURCE: He
  CONTENT: Plain, brown box
  DESTINATION: me

- A sudden gust of wind **blew** the lid off,
  FORCE: wind
  RESULT: blew the lid off.

- and inside **was** a rusty key.
  CONTENT: a rusty key

4. Ontology relationship:

- baseball player; pitcher; baseball team

  Baseball team has_member baseball player
  Baseball player has_subclass pitcher

- tree, maple, forest

  Tree has_subclass maple
  Forest has_memeber tree

5. Based on evidence from Potts 2011 (also in the slides), which is a stronger indicator overall of a movie review's polarity: the word good or the word bad?

The good word with high weights are a strong indicator for the movie polarity review. At the same time bad words with high negative weights are a strong indicator too.