Lin Ochoa CS381

Homework 2
Write up
Natural Language Processing

#1.1

Positive prior probability: 0.4
Negative prior probability: 0.6

pos neg
0.09 0.16 I
0.07 0.06 always
0.29 0.06 like
0.04 0.15 foreign
0.08 0.11 films

2.33856e-06 positive probability
5.7024e-06 negative probability
negative is greater

#1.2

action 0.0535714285714
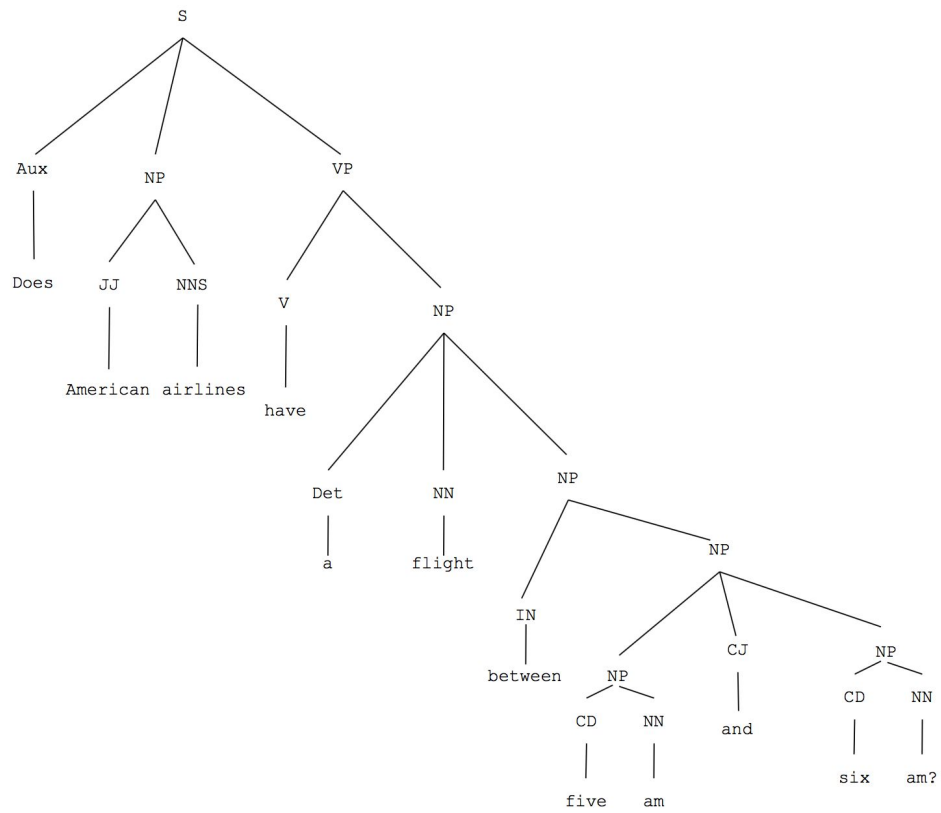comedy 0.0634920634921
comedy is the answer

#2

Errors
10.1
    1. Atlanta/NN
    2. dinner/NNS
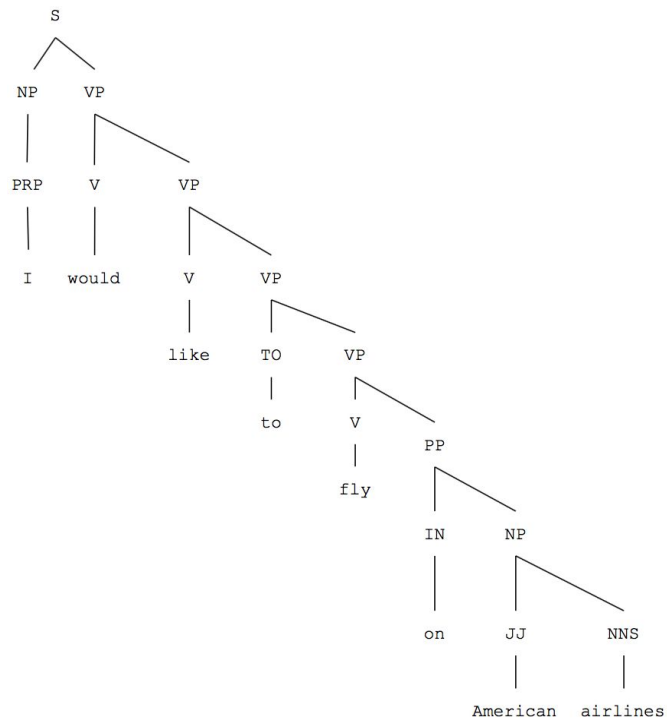   3. have/VB
    4. afternoon/NN

Parse Trees

1. Does American airlines have a flight between five a.m. and six a.m.?

```
                              S
              ┌───────────────┼───────────────┐
             Aux             NP               VP
              │           ┌───┴───┐        ┌───┴───────┐
            Does         JJ      NNS        V          NP
              │           │       │         │     ┌─────┼─────┐
            Does  American airlines        have  Det    NN    NP
                                            │     │      │   ┌──┴────────┐
                                          have   a    flight IN          NP
                                                               │    ┌─────┼──────┐
                                                            between  NP    CJ     NP
                                                                    ┌─┴─┐   │   ┌──┴──┐
                                                                   CD  NN  and  CD    NN
                                                                    │   │        │     │
                                                                  five  am      six   am?
```

2. I would like to fly on American airlines.

```
        S
      ┌─┴──┐
      NP   VP
      │  ┌─┴────┐
     PRP V      VP
      │  │    ┌─┴───┐
      I would V     VP
          │   │   ┌─┴──┐
        would like TO   VP
               │   │  ┌─┴──┐
              like to V    PP
                      │  ┌─┴──┐
                     fly IN   NP
                         │  ┌─┴────┐
                         on JJ     NNS
                            │       │
                       American  airlines
```

3. Please repeat that.

```
              S
              |
              VP
             /  \
            /    \
           V      VP
           |     /  \
           |    /    \
        Please  V     NP
                |      \
                |       \
              repeat   that.
```
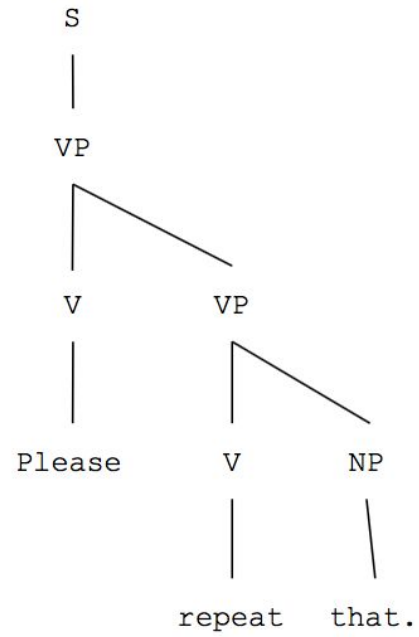
4. Does American 487 have a first-class section?

```
                          S
                  /       |        \
                 /        |          \
               Aux        NP          VP
                |        /  \        /  \
                |       /    \      /    \
              Does    NNP    CD    V      NP
                       |     |     |     / | \
                       |     |     |    /  |  \
                  American  485  have Det  JJ   NN
                                       |   |    |
                                       |   |    |
                                       a first-class section?
```
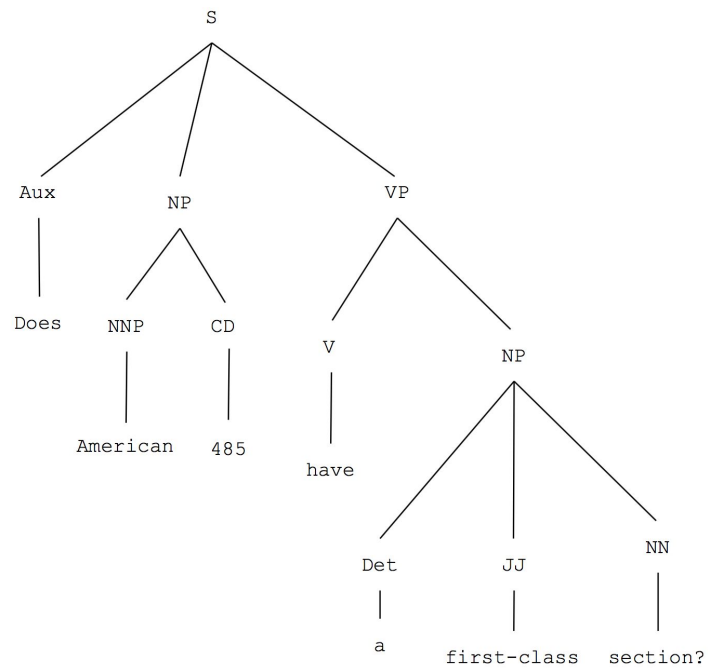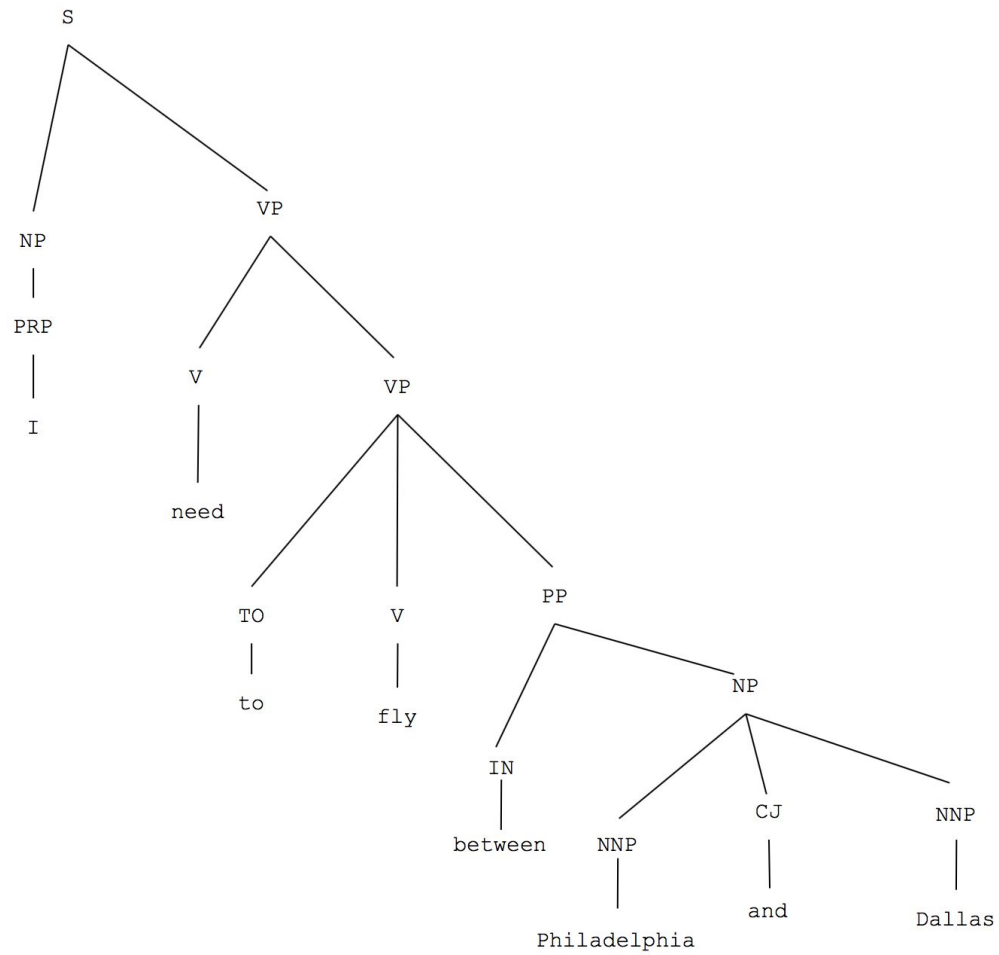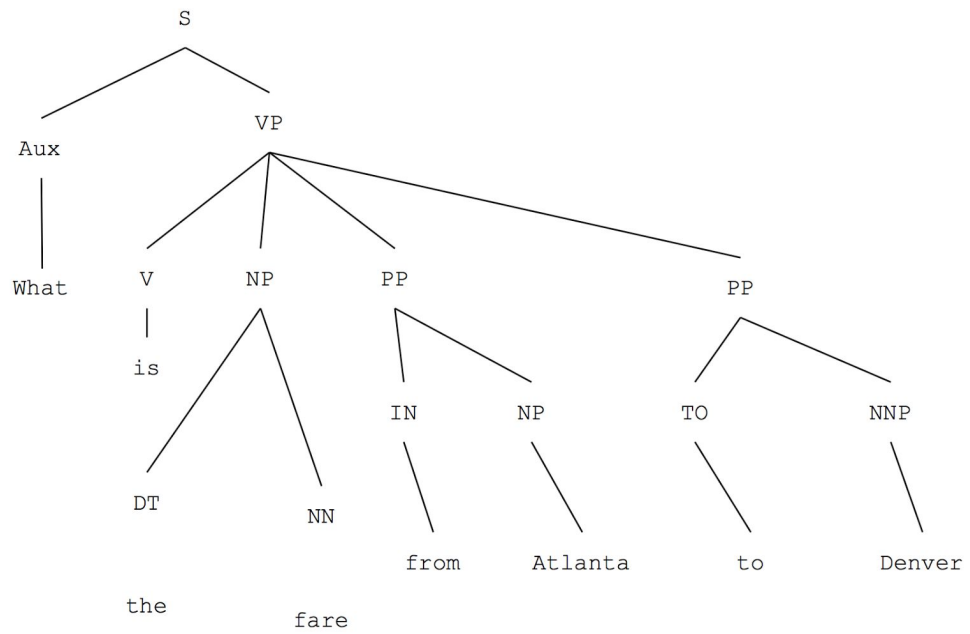
5. I need to fly between Philadelphia and Atlanta.

```
                    S
                   / \
                  /   \
                 /     \
                /       VP
               NP       |\
               |        | \
              PRP       |  \
               |        V   VP
               I        |   /|\
                      need / | \
                          /  |  \
                         /   |   \
                        TO   V    PP
                        |    |    /\
                        to  fly  /  \
                             IN   NP
                             |   /|\
                         between NNP CJ NNP
                                 |   |   |
                          Philadelphia and Dallas
```

6. What is the fare from Atlanta to Denver?

```
              S
             / \
           Aux  VP
            |  /|\___
          What V NP PP    PP
               |  |  /\   /\
              is DT NN IN NP TO NNP
                 |  |  |  |  |  |
                the fare from Atlanta to Denver
```

7. Is there an American airlines flight from Philadelphia to Dallas?

```
                              S
                              |
                              VP
                  _____/|_____
                 V           EX             NP
                 |           |             /  \
                 Is         there         NP    PP
                                         /  \    /  \
                                      DET    NP IN    NP
                                       |    /  \  |   /|\
                                      an  JJ   NP from NNP  TO  NNP
                                         /  \   |      |    |    |
                                 American airlines flight Philadelphia to Dallas?
```