

1.

a.

Iteration	U(1,1)	U(1,2)	U(1,3)	U(2,1)	U(2,3)	U(3,1)
0	0	0	0	0	0	0
1	-0.04	-0.04	-0.04	-0.04	-0.04	0.68
2	-0.076	-0.076	-0.076	0.44	-0.076	0.74
3	0.26	-0.11	-0.11	0.57	-0.11	0.79
4	0.40	0.13	-0.14	0.63	-0.14	0.80
5	0.46	0.27	0.03	0.65	-0.17	0.81

b.

Iteration	Q(1,1,right)	Q(2,1,right)	Q(3,1,up)
0	0	0	0
1	-0.04	-0.04	0.77
2	-0.07	0.58	0.85
3	0.43	0.71	0.86
4	0.58	0.73	0.86
5	0.61	0.73	0.86
6	0.62	0.73	0.86
7	0.62	0.73	0.86

2.

a. the wumpus smells the gold

$$= P(\text{wumpus}|\text{the}) * P(\text{smells}|\text{wumpus}) * P(\text{the}|\text{smells}) * P(\text{gold}|\text{the}) =$$

$$= \frac{8000}{8000 + 6000 + 2000} * \frac{5000}{5000 + 6000} * \frac{4000}{4000 + 2000} * \frac{2000}{2000 + 8000 + 6000} =$$

$$= 0.5 * \frac{5}{11} * \frac{2}{3} * 0.125 \approx 0.01893939 \approx 0.02$$

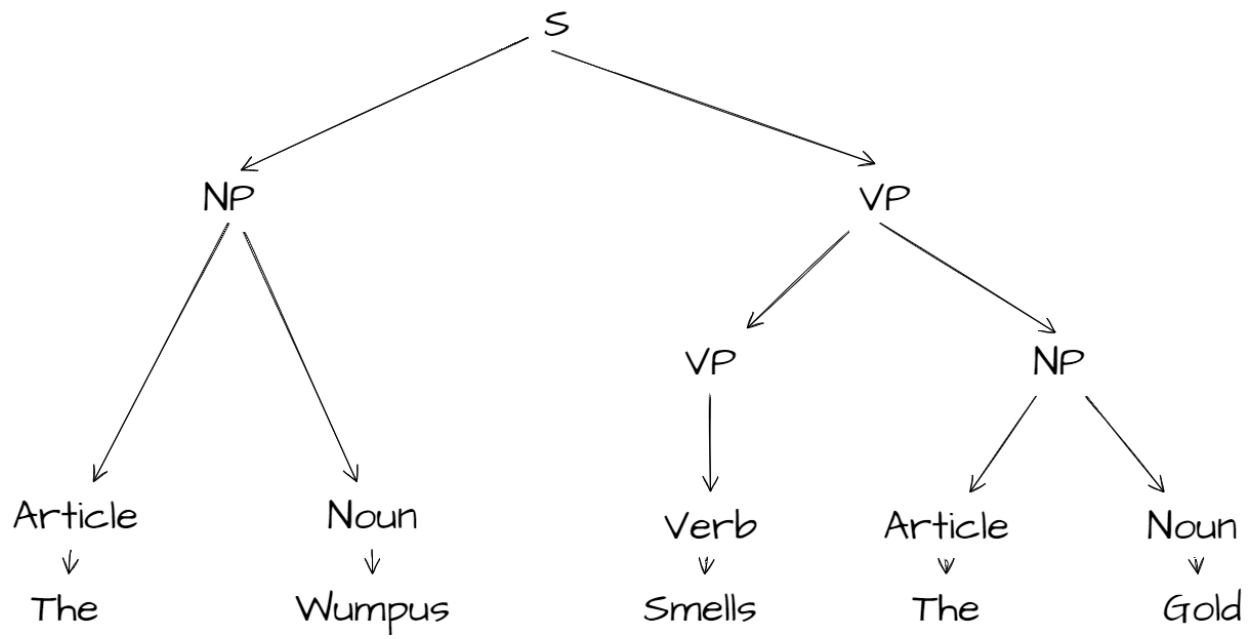
b. the wumpus is dead

$$= P(\text{wumpus}|\text{the}) * P(\text{is}|\text{wumpus}) * P(\text{dead}|\text{is}) =$$

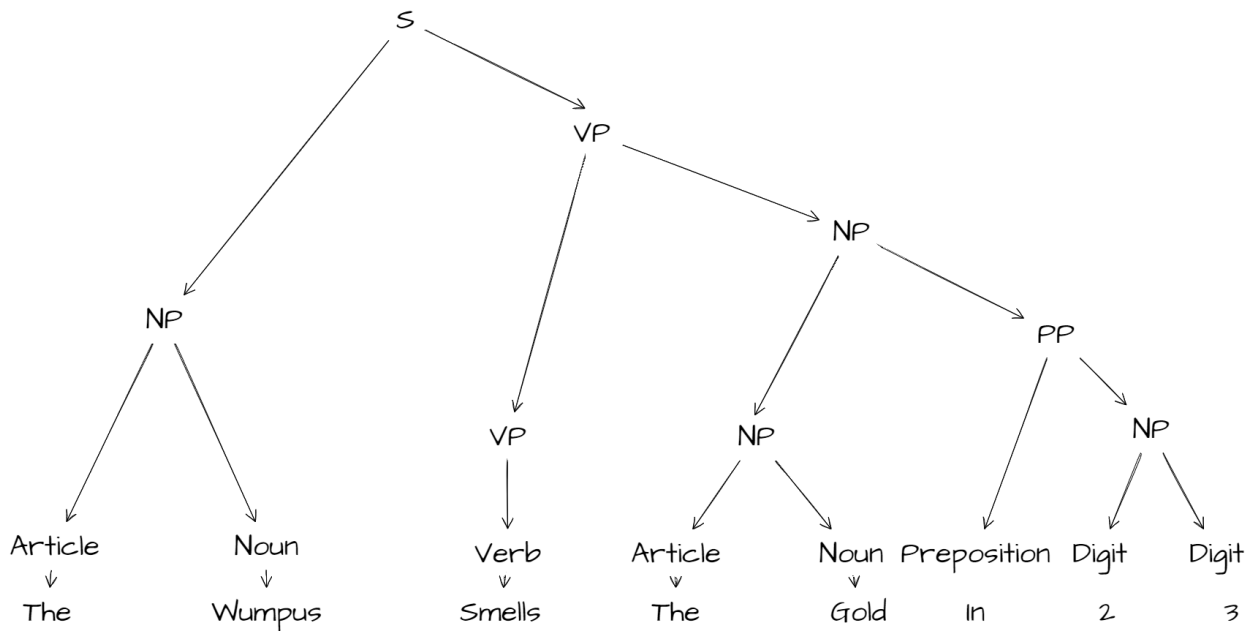
$$= \frac{8000}{8000 + 6000 + 2000} * \frac{6000}{6000 + 5000} * \frac{2000}{2000} = 0.5 * \frac{6}{11} * 1 \approx 0.2727 \approx 0.27$$

3.

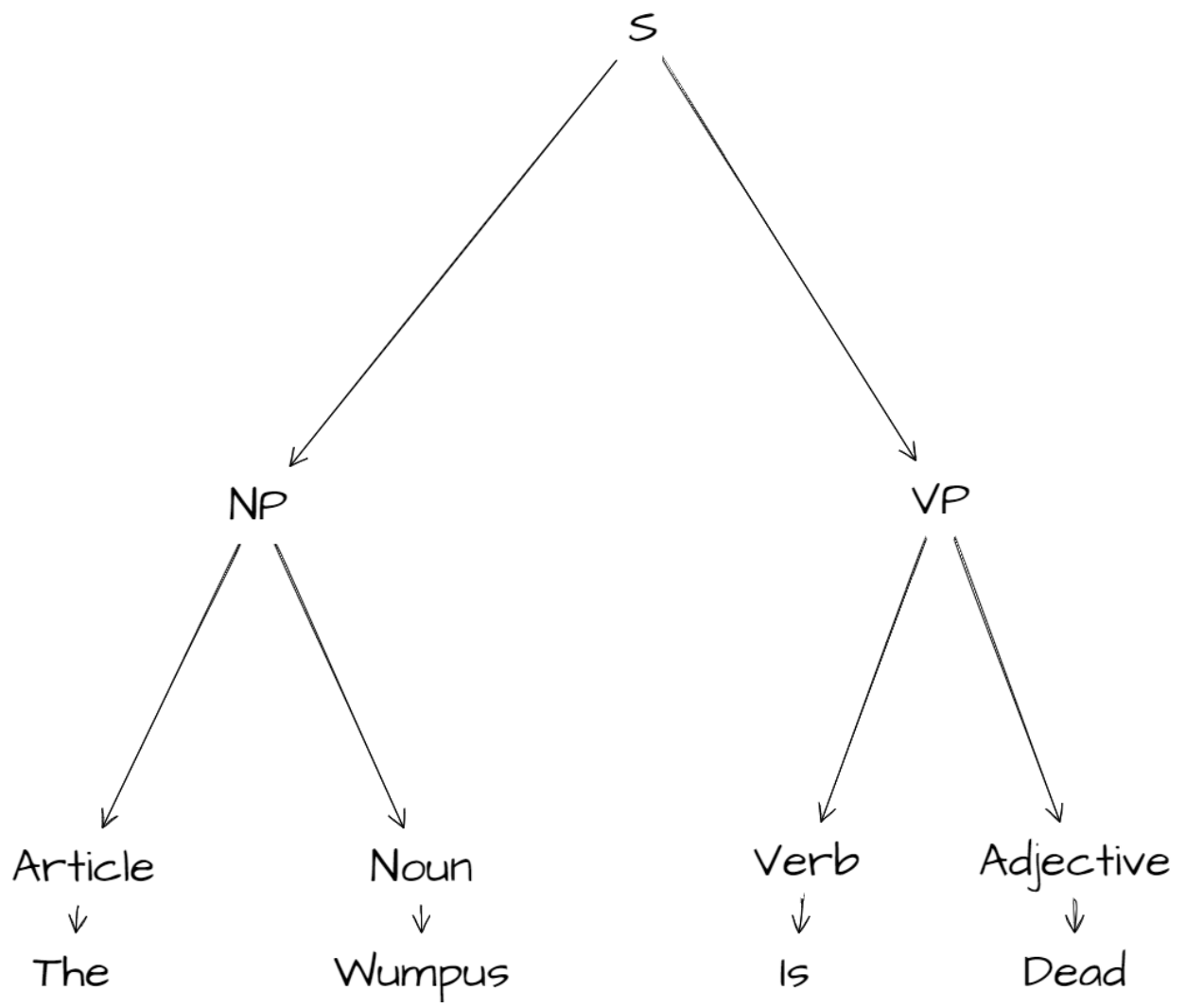
a.



b.



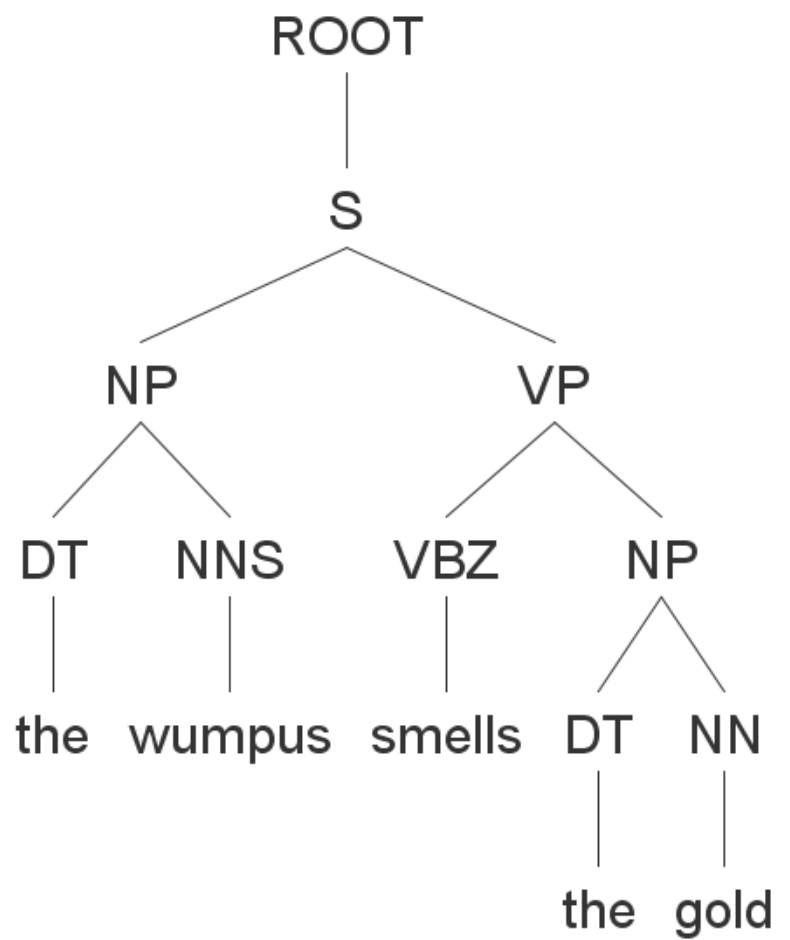
c.



4.

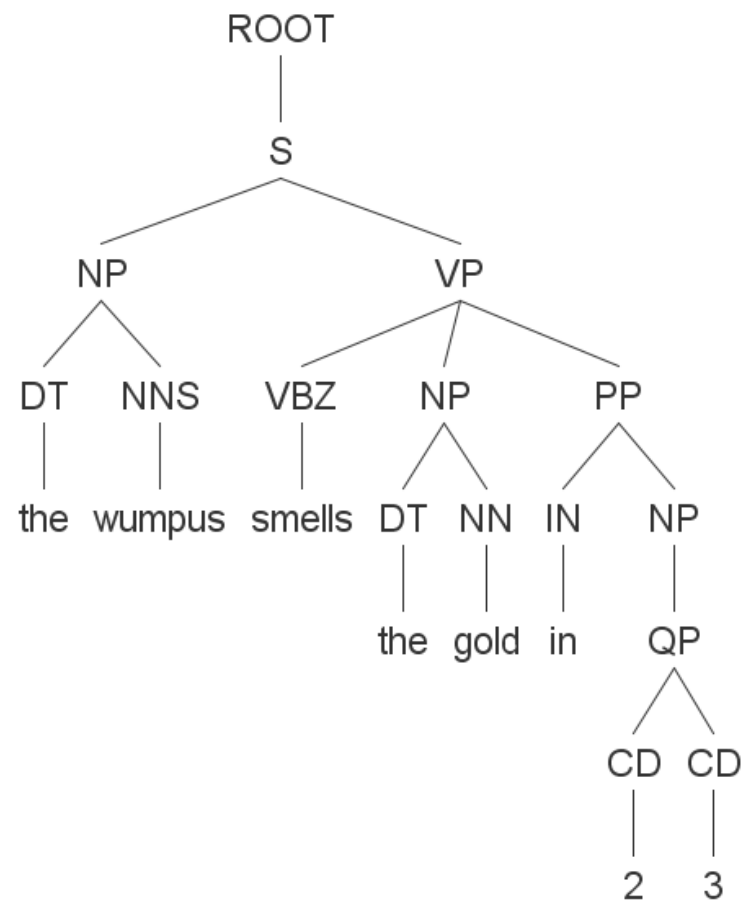
the wumpus smells the gold

Parser: edu/stanford/nlp/models/lexparser/englishPCFG.ser.gz



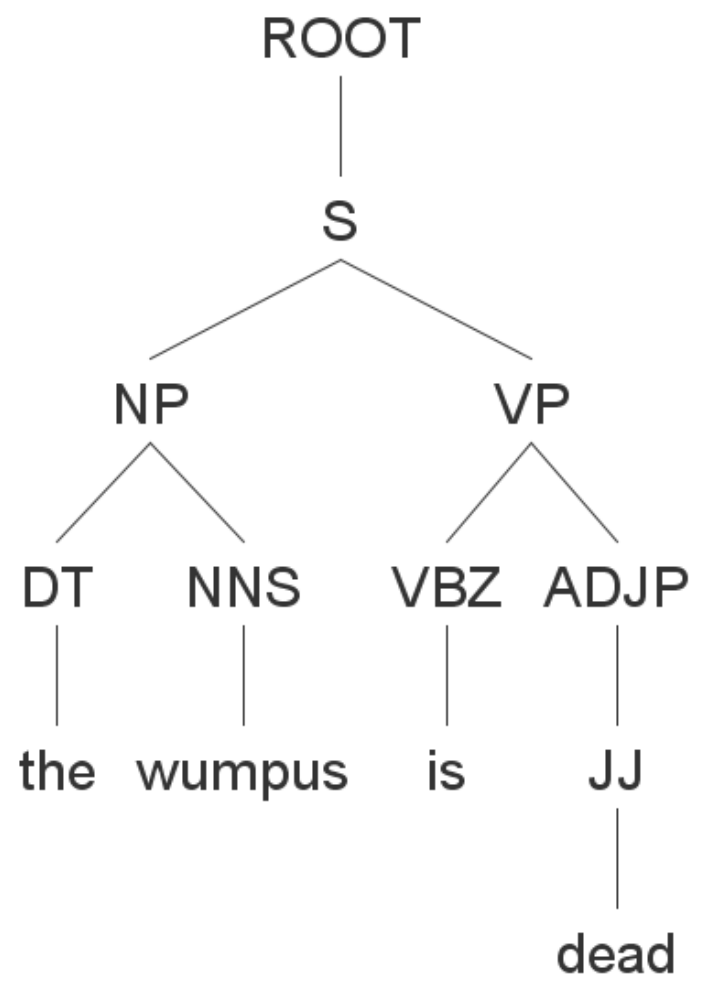
the wumpus smells the gold in 2 3

Parser: edu/stanford/nlp/models/lexparser/englishPCFG.ser.gz



the wumpus is dead

Parser: edu/stanford/nlp/models/lexparser/englishPCFG.ser.gz



5.

Iteration	U(1,1)	U(1,2)	U(1,3)	U(2,1)	U(2,3)	U(3,1)
0	0	0	0	0	0	0
1	-0.04	-0.04	-0.04	-0.04	-0.04	0.68
2	-0.08	-0.08	-0.08	0.44	-0.08	0.74
3	0.26	-0.11	-0.11	0.57	-0.11	0.79
4	0.38	0.13	-0.14	0.63	-0.14	0.80
5	0.46	0.26	0.03	0.65	-0.17	0.81
6	0.49	0.34	0.14	0.66	-0.05	0.81
7	0.51	0.37	0.21	0.66	0.05	0.81
8	0.51	0.39	0.25	0.66	0.12	0.81
9	0.52	0.40	0.27	0.66	0.16	0.81
10	0.52	0.41	0.29	0.66	0.18	0.81
11	0.52	0.41	0.30	0.66	0.20	0.81
12	0.52	0.41	0.30	0.66	0.21	0.81
13	0.52	0.41	0.30	0.66	0.21	0.81

As we can see, values converged after 12 iterations (for 13th iteration there's no change in values).