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CS 421

Assignment 4

Q1(b).

Input1: Flying planes can be dangerous.

Output1:

Flying	NNP	2	compound
planes	NNS	5	nsubj
can	MD	5	aux
be	VB	5	cop
dangerous	JJ	0	ROOT
.	.	5	punct

Input2: Amid the chaos I saw her duck.

Output2:

Amid	IN	3	case
the	DT	3	det
chaos	NN	5	obl
I	PRP	5	nsubj
saw	VBD	0	ROOT
her	PRP$	7	nmod:poss
duck	NN	5	obj
.	.	5	punct

For the first input the word “flying: is being classified as a compound to the word “planes”. This is incorrect because the word flying should be used as a verb, an action, relating to “flying a plane”.

For the second input the word “duck” is incorrectly classified as an “obj” (object) of the verb “saw”. Duck is ambiguous as in this context it is referring to seeing a duck, as in the animal, rather than it being an action of “ducking”, as in lowering your head to dodge something.

In both cases the sentences are vague in some manner. The parser cannot distinguish between the right labels to apply leading to the incorrectness.

Input3: The chicken is ready to eat.

Output3:

The	DT	2	det
chicken	NN	4	nsubj
is	VBZ	4	cop
ready	JJ	0	ROOT
to	TO	6	mark
eat	VB	4	xcomp
.	.	4	punct

In this example the word “chicken” is being used as a nominal subject of the word ready which is incorrect. The parser makes it seem like the chicken is the one who is ready to eat a meal, rather than the one being eaten.

Q2.

1. Fellowship(NSF GRFP) ∧ Budget(NSF GRFP) → ¬IndirectCosts(NSF GRFP)

   This rule means: If the fellowship is NSF GRFP and has a budget then indirect costs are not allowed.

2. ∃y NSFGRFPApplicant(y) ∧ MajorFieldofStudy(y, LifeSciences) → ApplicationDueDate(y , October 17, 2022)

   This rule means: If there is some NSF GRFP applicant with their intended major field of study being Life Sciences then the application due date for them is October 17, 2022.

3. ∃x Applicant(x) ∧ HasReferenceLetter(x) ∧ ApplyingTo(x, NSF GRFP) → SubmitReferenceBy(x, October 28 at 5:00 p.m)

   This rule means: If there is some applicant that has a reference letter and is applying to NSF GRFP then they must submit the letter by October 28 at 5:00 p.m.

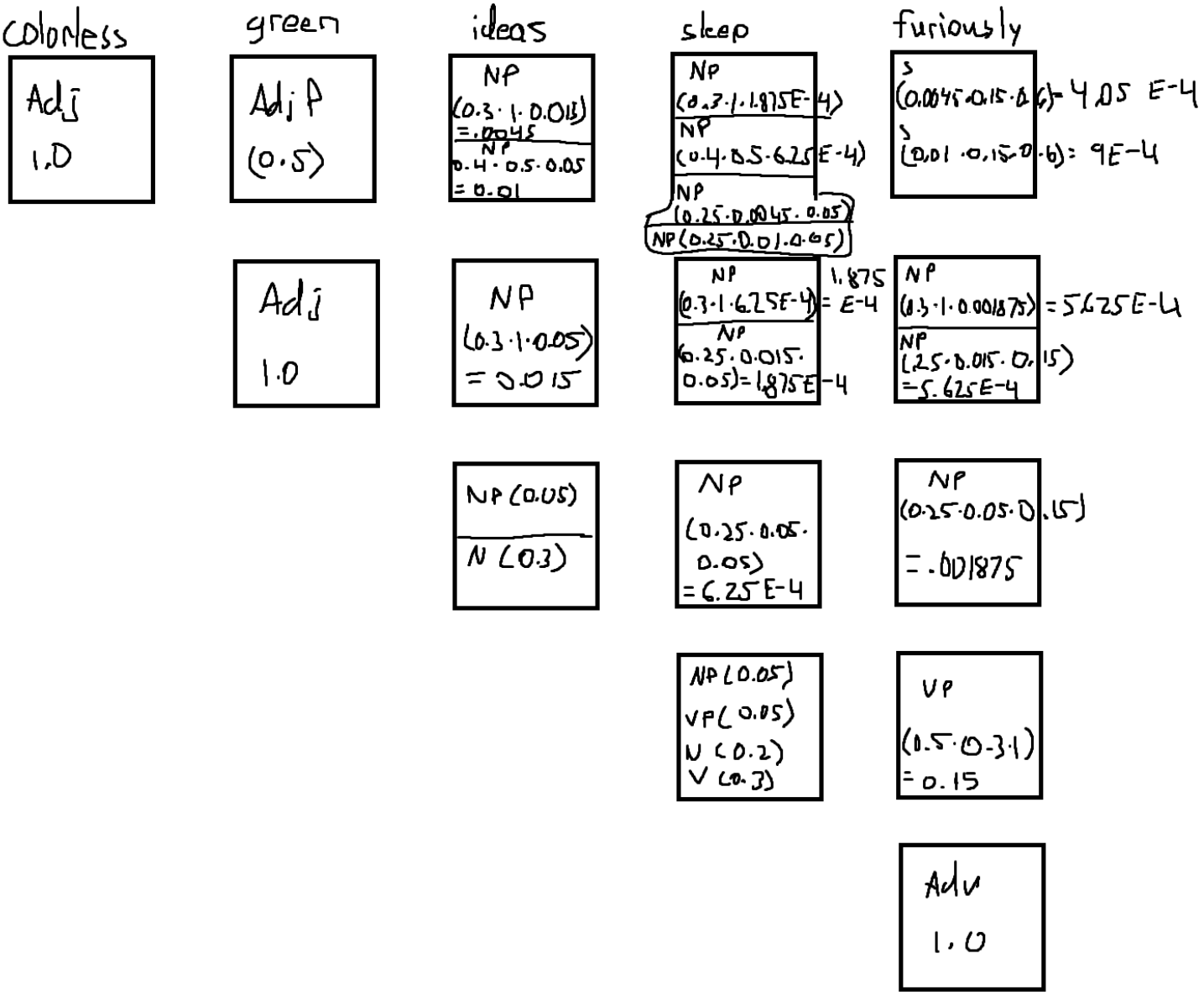
4. ∃x Applicant(x) ∧ GraduateStudent(x) ^ ApplyingTo(x, NSF GRFP) → ApplicationLimit(x, 1)

   This rule means: If there is some applicant who is a graduate and is applying to NSF GRFP then the application limit for them is 1.

5. ∃y NSFGRFPApplicant(y) ∧ MajorFieldofStudy(y, Engineering) → ApplicationDueDate(y, October 20, 2022)

   This rule means: If there is some NSF GRFP applicant with their intended major field of study being Engineering then the application due date for them is October 20, 2022.

Q3.


colorless
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ideas
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Adj
1.0
Adj P
(0.5)
NP
(0.3·1·0.015)
=.0045
NP
0.4·0.5·0.05
=0.01
NP
(0.3·1·1.875E-4)
NP
(0.4·0.5·6.25E-4)
NP
(0.25·0.0045·0.05)
NP(0.25·0.01·0.05)
S
(0.0045·0.15·0.6)=4.05 E-4
S
(0.01·0.15·0.6)=9E-4
Adj
1.0
NP
(0.3·1·0.05)
=0.015
NP
(0.3·1·6.25E-4)
1.875 E-4
NP
0.25·0.015·
0.05)=1.875E-4
NP
(0.3·1·0.001875)=5.625E-4
NP
(.25·0.015·0.15)
=5.625E-4
NP(0.05)
N(0.3)
NP
(0.25·0.05·
0.05)
=6.25E-4
NP
(0.25·0.05·0.15)
=.001875
NP(0.05)
VP(0.05)
N(0.2)
V(0.3)
VP
(0.5·0.3·1)
=0.15
Adv
1.0