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**Part 1**

%Homework 4 Part 1

:- use\_module(library(tabling)).

:- table s/2.

:- table np/2.

:- table vp/2.

:- table pp/2.

% enter your rules below

s --> np, vp.

np --> det, n.

vp --> vp, pp.

vp --> v, np.

pp --> p, np.

% the lexical rules (no need to edit below)

v --> [chased].

v --> [saw].

n --> [cats].

n --> [dogs].

n --> [garden].

n --> [house].

p --> [in].

p --> [behind].

p --> [from].

det --> [the].

**Part 2**

% homework 4 part 2

:- use\_module(library(tabling)).

:- table s/3.

:- table np/3.

:- table vp/3.

:- table pp/3.

% enter your rules below

s(s(NP, VP)) --> np(NP), vp(VP).

np(np(DET, N)) --> det(DET), n(N).

np(np(NP, PP)) --> np(NP), pp(PP).

vp(vp(VP, PP)) --> vp(VP), pp(PP).

vp(vp(V, NP)) --> v(V), np(NP).

pp(pp(P, NP)) --> p(P), np(NP).

% the lexical rules (no need to edit below)

v(v(chased)) --> [chased].

v(v(saw)) --> [sees].

n(n(cats)) --> [cats].

n(n(dogs)) --> [dogs].

n(n(garden)) --> [garden].

n(n(house)) --> [house].

p(p(in)) --> [in].

p(p(behind)) --> [behind].

p(p(from)) --> [from].

det(det(the)) --> [the].

**Part 3**

|  |  |  |
| --- | --- | --- |
| **Sentence** | **Total PPs in NP** | **Total number of Trees** |
| The dogs chased the cats | 0 | 1 |
| The dogs chased the cats in the garden | 1 | 2 |
| The dogs chased the cats in the garden behind the house | 2 | 5 |
| The dogs chased the cats in the garden behind the house in the garden | 3 | 14 |
| The dogs chased the cats in the garden behind the house in the house behind the garden | 4 | 42 |