Lists in Prolog

- Lists are written between brackets [ and ]
  - [] is the empty list
  - [b, c] is a list of two symbols b and c
- If H is a symbol and T is a list, then [H| T] is a list with head H and tail T
  - [a, b, c] = [a | [b, c]]

“Append” as a relation

- Relation append is a set of tuples of the form (X,Y, Z), where Z consists of the elements of X followed by the elements of Y
  - ([a],[b],[a, b]) is in the relation append
  - ([a],[b],[]) is not

Definition for Append

append([], Y, Y).
append([H|X], Y, [H|Z]) :- append(X, Y, Z).

- In English:
  [1] append[] and Y to get Y.
  [2] append [H|X] and Y to get [H|Z] if append X and Y to get Z

?- [append]
   !
   % append compiled 0.00 sec, 852 bytes

Yes
?- append([a,b],[c,d],Z).
   Z = [a, b, c, d] ;
No
?- append(X,[c,d],[x, y, z, c, d]).
   X = [x, y, z] ;
No
?- append(X,Y,[a, b]).
   X = []
   Y = [a, b] ;
   X = [a]
   Y = [b] ;
   X = [a, b]
   Y = [] ;
   No