Homework 5 – CS 445 – AI Adam Stammer

See associated pl file for loadable prolog code

Create a file containing the following Prolog clauses:

```
thing([],[X],X).
thing([H|T],[H|X],Y) :- H = 1, anything(Y,Z), thing(T,X,Z).
thing([H|T],[H|X],Y) :- H = 0, nothing(Y,Z), thing(T,X,Z).
nothing(1,1).
nothing(0,0).
anything(1,0).
anything(0,1).
```

1. Give all answers to the query: `thing([0,0,1],X,0).`

X = [0, 0, 1, 1].

2. Give all answers to the query:`thing(X,[0,0,1],1).`

X = [0, 0].

3. Give all answers to the query:`append([1,2],[2,3],X).`

X = [1, 2, 2, 3].

4. Give all answers to the query:`append(X,Y,[1,2]).`

X = [],
Y = [1, 2].

5. Create a Prolog predicate`flattenappend/3`which has 3 arguments that are alllists. The third list should be equivalent to the concatenation of the flattened ver-sions of the first list followed by the flattened version of the second list. For exam-ple,`flattenappend([1,2,[3,4,5],[6]],[[7],[8,[9]]],X)` should succeed bind-ing`X`to the list`[1,2,3,4,5,6,7,8,9]`. Use the built-in predicates`append/3`and`flatten/2`.

flattenappend(List1, List2, Result) :- flatten(List1, X), flatten(List2, Y), append(X, Y, Result).

6. Create a Prolog predicate`combine/4`which has 4 arguments that are all lists. Thefourth list should be equivalent to the concatenation of the first list, the reverse of thesecond list, followed by the third list. For example,`combine([1,2],[3,4,5],[6,7],X)` should succeed binding`X`to the list`[1,2,5,4,3,6,7]`. Use the built-in predicates`append/3`and`reverse/2`.

combine(List1, List2, List3, Result) :- reverse(List2, X), append(List1, X, Y), append(Y, List3, Result).