CMPT 310

Assignment 1 Solutions

1- Show that abduction is unsound in propositional calculus, by using truth tables to enumerate all interpretations.

p	q	p → q	p → q ∧ q	(p → q ∧ q) → p
T	T	T	T	T
T	F	F	F	T
F	T	T	T	F
F	F	T	F	T

2- Say whether the following sets of terms are unifiable. If so, show their most general unifier. If not, say why not.

S1={g(a(b,Z)),X,g(b,w(a))}: not unifiable because g(a(b,Z)) and g(b,w(a)) have different number of arguments.

S2={+(2,3),5}: not unifiable because a term cannot unify with a predicate.

S3={W,f(a,W),f(a,b)}: not unifiable because there is a recursion when unifying W and f(a, W).

S4={f(a(b,Y)),f(a(X,c))}: unifiable with {X=b, Y=c}, MSG is f(a(X, Y))

3- Given the following assumptions, which we give both in clause form and in English sentences:

1. boring(tv).
2. boring(X):- watches(X,Y), boring(Y).
3. watches(bibi,tv).

a) ?- boring(bibi) (or ~boring(bibi))

b) H={tv, bibi}

c) refer to the examples in the slides

4- Let the intended interpretation of parity(X, odd). be X is odd and parity(X, even) be X is even. Let the notion of opposite parities be expressed by the two clauses opp(odd, even). and opp(even, odd). Define the notion of a number being odd or even using only three additional clauses, two of them variable-free assertions.

```
opp(odd, even).

opp(even, odd).

parity(0, even).

parity(s(X), P) :- parity(X, O), opp(P, O)
```