

**CSC324H FALL 2009 Tutorial 9**  
**Week of Nov. 30- Dec. 4, 2009**

## Prolog search tree examples

### Example 1 (with not):

- (1) holiday(friday, april14).
- (2) weather(friday, fair).
- (3) weather(saturday, fair).
- (4) weather(sunday, fair).
- (5) workday(friday).
- (6) picnic(Day):- weather(Day,fair),  
not(workday(Day)).
- (7) picnic(Day):-holiday(Day,\_).

?- picnic(When).

When = saturday;

When = sunday;

When = friday;

false.

Notice that the output of multiple solutions are in particular order, why? See the Prolog search tree next page.

### Example 2 (with cut):

- (1) a(1) :- b.
- (2) a(2) :- e.
- (3) b :-!,c.
- (4) b :- d.
- (5) c:- fail.
- (6) d.
- (7) e.

?-a(X).

X = 2. % See Prolog search tree below.

### Example 3 (bubble sort without cut – incorrect program):

- (1) bubble(List,Sorted):-swap(List,List1),  
bubble(List1,Sorted).
- (2) bubble(Sorted,Sorted).
- (3) swap([X,Y | Rest],[Y,X | Rest]) :- X > Y.
- (4) swap([Z|Rest],[Z|Rest1]) :- swap(Rest,Rest1).

?- bubblesort([10,3,1],Res). % see search tree below

### Example 4 (bubble sort with cut – correct program):

- (1) bubble(List,Sorted):-swap(List,List1), !,  
bubble(List1,Sorted).
- (2) bubble(Sorted,Sorted).
- (3) swap([X,Y | Rest],[Y,X | Rest]) :- X > Y.
- (4) swap([Z|Rest],[Z|Rest1]) :- swap(Rest,Rest1).

?- bubblesort([10,3,1],Res). % see search tree below.