CMSC 330 Spring 2017 Quiz #5

Name _____

Discussion Time (circle one) 10am 11am 12noon 1pm 2pm 3pm

Discussion TA (circle one) Aaron Alex Austin Ayman Daniel Eric Greg Jake JT Sam Tal Tim Vitung

Instructions

- Do not start this quiz until you are told to.
- You have 15 minutes for this.
- This is a closed book quiz. No notes or other.

1. (8 pts) Given the following clauses, list all answers returned by the queries. Note, these facts may not be factually accurate.

a. (3 pts) ?- married(X,Y). X = kanye, Y = kim **;** X = kanye, Y = kourtney **;** X = scott, Y = kim. b. (1 pt) ?- \+child(kim). true.	c. (2 pts) ?- family(X,Y). X = kim, Y = kourtney **;** X = kourtney, Y = kim **.** d. (2 pts) ?- sibling(X,Y). X = Y, Y = penelope **;** X = penelope, Y = north **;** X = north, Y = penelope **;** X = Y, Y = north.

Unification:

(2 pts) Show the variables bindings (values assigned) if the following queries succeed. Use false otherwise.

1. `f(X,a,h,g(Y)) = f(h(Z), Z, h(W)).`
   `false.`
2. `p(X,g(b,Y),L) = p(a,g(Z,f(X)),[X|Zs]).`
   `X = a, Y = f(a), L = [a|Zs], Z = b.`

Prolog Programming:

(10 pts) Implement a prolog predicate `takeNth(N,L,M)` such that `takeNth(N,L,M)` is true if and only if M is the list obtained by taking every Nth element from the list L. For example the query:

```
?- takeNth(2, [1,2,3,4,5,6,7,8], M).
M = [1, 3, 5, 7].

?- takeNth(3, [1,2,3,4,5,6,7,8], M).
M = [1, 4, 7].
```

Hint: Consider writing a helper predicate that drops the first N elements of the list.

```
takeNth(N,List,Taken) :-
  findall(A,(nth0(Index,List,A),0 is Index mod N),Taken).
```

Rubric:

1. (5 points) any way of finding the Nth element.
2. (5 points) any way of collecting the Nth elements.