

CMPT 383

Quiz #5

November 8, 2005

- 1) Translate the following statement into Prolog rule(s): “Everybody who has a child is happy” (introduce a one-argument relation **happy**).
- 2) Define the relation **grandchild** using the **parent** relation.
- 3) Which of the following are syntactically correct Prolog terms? What kinds of terms are they?
 - a) Diana
 - b) diana
 - c) 'Diana'
 - d) _diana
 - e) 'Diana goes south'
 - f) goes(diana,south)
 - g) 45
 - h) 5(X,Y)
 - i) +(north,west)
 - j) three(Black(Cats))
 - k)
- 4) Will the following matching operations succeed or fail? If they succeed, what are the resulting instantiations of variables?
 - a) point(A,B) = point(1,2)
 - b) point(A,B) = point(X, Y, Z)
 - c) plus(2,2) = 4
 - d) +(2,D) = +(E,2)
 - e) triangle(point(-1,0),P2,P3) = triangle(P1,point(1,0),point(0,Y))
- 5) Rewrite the following program without using the semicolon notation:

```
translate(Number,World) :-  
    Number = 1, Word = one;  
    Number = 2, Word = two;  
    Number = 3, Word = three.
```
- 6) Define the relation
`max(X,Y,Max)`
so that `Max` is the greater of two numbers `x` and `y`.
- 7) Let a program be:

```
p(1).  
p(2) :- !.  
p(3).
```

Write all Prolog’s answer to the following questions:
 - a) ?- p(X).
 - b) ?- p(X),p(Y).
 - c) ?- p(X), !, p(Y).
- 8) Given the following fact `located_in(austin,texas)`. A beginning Prolog student has the following dialogue with the computer:

```
?- located_in(austin,X).  
X = texas  
?- write(X).  
X is uninstantiated
```

Why did not the computer print ‘texas’ the second time?
- 9) Explain which of the following queries succeed, fail, or raise error conditions, and why:
 - a) 5 is 2+3.
 - b) 5 ::= 2+3.
 - c) 5 = 2+3.
 - d) 4+1 is 2+3.
 - e) 4+1 ::= 5.
 - f) What is 2+3.
 - g) What ::= 2+3.
 - h) What is 5.
 - i) What = 5.