**Quiz 11**

**DSCI 558 BUILDING KNOWLEDGE GRAPH**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Question 1 ( 6 pts)

Given the following ground PSL rules:

HS: HardWorkingStudent

GG: HasGoodGrades

RC: RetakesClasses

1. HS(X) -> GG(X)
2. RC(X) -> !HS(X)
3. HS(X) & GG(X) -> !RC(X)

!Q = 1-Q

P -> Q = min(1, 1 – P + Q)

P & Q = max(0, P+Q-1)

P | Q = min(1, P+Q)

And observations:

* HS(Bob): 0.7
* GG(Bob): 0.5
* RC(Bob): 0.3

Compute the truth values of the three ground PSL rules above (where X=Bob).

Case 1: Rule 1: 01- 0.7 + 0.5 = 0.8

Rule 2: 1 – 0.3 + (1- 0.7) = 1

Rule 3: 1 – (0.7 + 0.5 – 1) + (1 – 0.3) = 1.5 => 1

Case 2:

And observations:

* HS(Bob): 0.3
* GG(Bob): 0.5
* RC(Bob): 0.8

Rule 1: 1 – 0.3 + 0.5 = 1.2 => 1

Rule 2: 1 – 0.8 + (1 – 0.3) = 0.9

Rule 3: 1 – (0.3+ 0.5 – 1 < 0) + (1 -0.8) = 1

Case 3:

1. HS(X) -> GG(X)
2. RC(X) -> !HS(X)
3. HS(X) | GG(X) -> !RC(X)

And observations:

* HS(Bob): 0.7
* GG(Bob): 0.5
* RC(Bob): 0.3

Rule 3: 1 - (0.7 + 0.5 > 1) + (1 – 0.3) = 0.7

Case 4:

1. HS(X) -> GG(X)
2. RC(X) -> !HS(X)
3. HS(X) | GG(X) -> !RC(X)

And observations:

* HS(Bob): 0.3
* GG(Bob): 0.5
* RC(Bob): 0.8

Rule 3: 1 - (0.3 + 0.5) + (1 – 0.8) = 0.4

## Question 2 (4 pts)

Arrange the following rules into their correct categories: local rules and relational rules.

Votes(A,P) & Spouse(B,A) -> Votes(B,P) Relational

Donates(A, P) -> Votes(A, P) Local

Friend(A,B) & Friend(B,C) -> Friend(A,C) Relational

Mentions(A, “Affordable Health”) -> Votes(A, “Democrat”) Local