**CSC 503 Homework Assignment 8**

Out: October 5, 2015

Due: October 12, 2015

**rsandil**

1. (a)

i. sum(x, 0, x)

ii. sum(x, s(y), w) : - sum(s(x), y, w)

(b)

i. sum(x, 0, x)

ii. sum(x, s(y), w) : - sum(s(x), y, w)

iii. ¬ sum(s(0), s(s(0)), u)

iv. From (ii) and (iii) using substitution {s(0)/x, s(0)/y, w/u, z/w }

get :− sum (s(s(0)), s(0), z)

v. From (ii) and (iv) using substitution {s(s(0))/x, 0/y, w/z, v/w}

get :− sum (s(s(s(0))), 0, v)

vi. From (i) and (v) using substitution {s(s(s(0)))/x, x/v}

get

1. (a) Alice ≠ Bob

(b) ∀x (x = Alice ∨ x = Bob)

(c) i) ¬Female (Bob)

ii) ¬Woman (Bob)

(d) CWA (DB) is consistent if we assume that names are unique and inconsistent if Alice and Bob are same.

1. (a) University(NCSU) – Abox because it is about instance of a concept.

(b) GraduateStudent =̇ Student ⊓ Ǝattends.GraduateCourse - Tbox because it is the definition of a concept.

(c) Ǝ y (GraduateStudent(x) ↔ Student(x) ᴧ GraduateCourse(y) ᴧ attends(x, y))

(d) GraduateStudent =̇ Student ⊓ [∀attends.[GraduateCourse ⊓ [∀teaches.Professor]]]

(e) ∀ y ∃ z(GraduateStudent(x) ↔ Student(x) ᴧ GraduateCourse(y) ᴧ attends(x, y) ᴧ Professor(z) ᴧ teaches(z, y))