# CSC 600 – Assignment 4 – Logic Programming

Due: Sunday, November 12th. 2017 @ midnight

Due: Tuesday, November 14th. 2017 @ midnight

**1. For your family (or any other real or hypothetical family) write a PROLOG "family.pl" program that includes the following facts:**

- is_male( NAME).
- is_female(NAME).
- is_parent_of(PARENT,CHILD ).

Add to these facts the following inference rules:

- mother(MOTHER, CHILD)
- father(FATHER, CHILD)

- sibling1(NAME1, NAME2) (1 parent in common)
- brother1(NAME1, NAME2) (1 parent in common)
- sister1(NAME1, NAME2) (1 parent in common)

- sibling2(NAME1, NAME2) (2 parents in common)
- brother2(NAME1, NAME2) (2 parents in common)
- sister2(NAME1, NAME2) (2 parents in common)

- cousin(NAME1, NAME2)
- uncle(UNCLE, CHILDNAME)
- aunt(AUNT, CHILDNAME)
- grandparent(GRANDPARENT, GRANDCHILD)
- grandmother(GRANDMOTHER, GRANDCHILD)
- grandfather(GRANDFATHER, GRANDCHILD)
- grandchild(GRANDCHILD, GRANDPARENT)

- greatgrandparent(GREATGRANDPARENT, GREATGRANDCHILD)

- ancestor(ANCESTOR, CHILDNAME)

Show the results of your program for each of inference rules.

**Note:** In various cultures there are different interpretations of family relationships. All such interpretations are equally acceptable, and you may select any one of them.

2. **Write a PROLOG program that includes the following operations with lists:**

    1. membership testing (is an element member of a list?)
    2. first element
    3. last element
    4. two adjacent elements
    5. three adjacent elements
    6. append list1 to list2 producing list3
    7. delete element from a list
    8. append element to a list
    9. insert element in a list
    10. compute the length of list
    11. reverse a list
    12. check whether a list is a palindrome
    13. display a list

    For each of these operations write your implementation of the operation and show an example of its use. If a predicate already exists (predefined in Prolog), modify its name (e.g. myappend or append1).

    Lists to be processed can be created by an auxiliary program, defined as facts, or entered from the keyboard