**CSE 465/565**

**Spring 2023**

**Homework #2**

**100 points**

*Instructions: Submit to Canvas a single zip file that contains an electronic copy of your answers and programs. Your zip file must have the following directory structure, where uniqueID is your Miami University uniqueID:*

*uniqueIDHW2 ; top-level directory containing all of your stuff*

*ex1.txt ; contains your answers to* ***exercise******1***

*ex2.txt ; your ASP code for* ***exercise 2*** *below*

(1) (40 points) Consider the program in the file *ex1.txt*. What is the English reading for each of the rules from *ex1.txt* that are listed below? Write your English reading for each rule in a comment that you add to the text file *ex1.txt*. Include your updated *ex1.txt* file in the submission zip file.

number(1 .. 1000).

-pages(X, N1) :- pages(X, N2),

N1 != N2,

number(N1),

number(N2).

genre(X, mystery) | genre(X, science\_fiction) | genre(X, romance) :- book(X).

has\_author(X) :- author(X, P).

anonymous\_book(X) :- book(X), not has\_author(X).

:- genre(B, G1), genre(B, G2), G1 != G2.

#show anonymous\_book/1.

(2). (60 points) Write an ASP program that can determine if one person is a **grandmother**, **niece**, **full sibling**, **half sibling**, or **cousin** of another person. Pay attention to which of these labels are gender specific versus not.

The program you write should run with the clingo solver and should define five relations:

grandmother(X, Y) – X is a grandmother of Y

niece(X, Y) – X is a niece of Y, i.e., X is a daughter of Y’s sibling

full\_sibling(X, Y) – X is a full sibling of Y, i.e., X has the same two parents as Y

half\_sibling(X, Y) – X is a half sibling of Y, i.e., X has one parent in common with Y but not the other

cousin(X, Y) – X is a first-degree cousin of Y

To test your program, use the family information provided in the starter file *ex2.txt*. Extend the starter file with your own rules for the five relations above. You may add helper predicates and rules as needed. You can reuse rules you have seen in class.

Your solution may be tested on additional family trees.

Include your completed *ex2.txt* file in your submission zip file.