CSE 465/565

Homework #3: (80) points

Outcomes:

- Understanding how a logical programming language works and some of the difficulties
- Working with Prolog files
- Solving problems using Prolog
- Running, testing, and tracing Prolog codes

Scoring (465/565):

- (65 pts) Successful implementation of all 9/10 (extra question for graduate students) problems. In addition to correct step-by-step tracing of 2 prolog queries.
- (10 pts) Correct submission on GIT with **6 or more** commits**.**
- (5 pts) The quality of your code.

Requirements:

- On your laptop, add a new folder inside your '**CSE465_565**' folder, and call it '**Homework3**'.
- Download '**hw3.pl'** and '**zipcodes.pl**' from canvas and put them inside the '**Homework3**' folder.

Instructions:

1. Follow the instructions inside the **hw3.pl** file. Inside this file:
    a. Undergraduate students need to solve **7** problems
    b. Graduate students need to solve **9** problems
2. Consider the following Prolog rules. Trace the following query to demonstrate the step-by-step trace of how Prolog determined the result; do this cleanly and legibly, including both **fail and successful calls**.
    You need to save this as a **pdf** or **jpg** file and put it inside the '**Homework3**' folder.

```
eo(L, [], L).
eo([], L, L).
eo([H1|T1], [H2|T2], [H1,H2|T]) :- eo(T1, T2, T).

Query: eo([1,2,3,4,5], [a,b,c], L).
```

3. Repeat the previous problem for the following rules query.
    You need to save this as a **pdf** or **jpg** file and put it inside the '**Homework3**' folder.

```
enigma2(A, [A|_]) :- !.
enigma2(A, [_|T]) :- enigma2(A, T).
enigma([A,B|_], [A|T2]) :- enigma2(B, T2), !.

Queries:   enigma([1,2], [1,1,2]).
```

4. You are required to submit your work (‘hw3.pl’ , along with two pdf/jpg files, all inside ‘Homework3’ folder) on GIT, ensuring that you make **6 or more** commits. The purpose of using GIT extends beyond merely uploading your work. It serves to demonstrate the progression of your work through multiple commits, thereby adding authenticity to your efforts. **Therefore, committing and pushing your work right after any small progress, would be ideal.**

Test your program:

Come up with more tests and test your program comprehensively. Your predicates will be tested separately with more tests.

Proper testing requires time. Begin by considering various scenarios and delving into the specifics. Eventually, you'll need to come up with a way to validate your solutions using the data at hand. Remember, thorough testing demands quality time devoted at the end to ensure your code functions as intended. So, as you manage your schedule for this assignment, make sure to allocate sufficient time for testing. The consequence of lack of proper testing will result in losing points.

Submission:

Submit the GitHub/GitLab URL of the project ‘**Homework3**’.
Inside this folder there should be 3 files:

1. **hw3.pl**
2. **Two jpg** or **pdf** files demonstrating step-by-step trace of ‘eo’ and ‘enigma’ queries.