# CS 441 – Fall 2019
# Assignment #5
Due: 11/22/2019

For this assignment you will be completing three different tasks in your exploration of the logic programming language: Prolog. You will be responsible for creating Prolog predicates that satisfy the following problems:

1. Write a Prolog predicate `aunt(X,Y)` that is true if `X` is `Y`'s aunt. For this particular exercise we will not consider aunts by marriage - meaning that for `X` to be `Y`'s aunt the two must be related by blood. For instance (user input is in **red**):

```
?- aunt(lydia,ann).
Yes

?- aunt(ann,brittany).
No

?- aunt(lydia,X).
X = ann ;
No

?- aunt(X,Y).
X = lydia
Y = ann ;
No
```

2. Write a Prolog predicate `sublist(X,Y)` that is true if list X is a sublist of list Y. For instance (user input is in **red**):

```
?- sublist([a,b],[a,b]).
Yes

?- sublist([a,b],[a,c]).
No

?- sublist([a,b],[b,a]).
No

?- sublist([],[a,b,c]).
Yes

?- sublist([a],[]).
No
```

```
?- sublist(X,[a,b,c]).
X = [] ;
X = [a] ;
X = [a, b] ;
X = [a, b, c] ;
X = [a, c] ;
X = [b] ;
X = [b, c] ;
X = [c] ;
No
```

3. Write a Prolog predicate that performs an Insertion Sort `sort(Y, X)` on a given list Y – returning the sorted list. We will assume that the list does not contain any sub lists. For instance (user input is in **red**):

```
?- sort([5, 4, 6, 1, 2], X).
X = [1, 2, 4, 5, 6];
No
```

## Development Process:

The code must compile and run on Thomas (**thomas.butler.edu**) using the GNU Prolog version installed. Each solution should be in its own Prolog file (e.g., `Ans1.pl`, `Ans2.pl`, `Ans3.pl`)

In addition to the three Prolog programs you will be submitting – you are also expected to submit a report that demonstrates that you have "tested" each program along with a brief discussion on how each was implemented in the Prolog language. You should highlight what you learned during this exercise and how this language compares to any and all imperative languages you have previously used. You are expected to submit a "professional" report with this submission (either a PDF or a Word document). This report should include answers and discussion to the above listed questions.

Make sure to include the Honor Pledge and Digital Signature in your source files! You can include comments in Prolog using a Java Doc style (e.g., `/** */`). Failure to do so will result in a deduction of points.

## Submission:

All assignments must be submitted on Butler GitHub (**github.butler.edu**). The name of your Butler GitHub repository must be as follows: **cs441_fall2019**

Make sure your repository is **private** and that I (**rrybarcz**) am added as a collaborator. Failure to do so will result in a loss of points.

**The following assignment should be done individually. All work is expected to be your own.**