**CLIPS Exercise 6: Putting It Together Part 1**

***Complete ALL of the following sections.***

# Scenario (to understand the context):

**Task:**

* Students need a system to be able to assist them in planning their classes for their degree.
* Create an expert system to work for planning the IT classes for a student who is earning an [AS in CIT (program #3504) for the current catalog year](https://ss2.sfcollege.edu/eSantaFe?hptAppId=AA4465E&hptExec=Y&hptRecord=AA4465UI1&MAJOR-CD=3504&GUEST_FL=P&hptUIRecordPackage=aa4465e.pkg&hptUIRecordPackage=aa4465e.pkg).

**Knowledge Requirements:**

* The student must take all classes required in the degree.
* The appropriate prereqs for classes must have been scheduled before the system can schedule the class.
* The student can only take a limited number of classes each semester (i.e. a constant number of classes)
* The student will only take classes in the degree (since financial aid only pays for those classes).

**Simplifications:**

* General education classes will be generic (such as GenEd1, GenEd2, etc.).
* IT Electives will be generic (such as ITElective1, ITElective2, etc.)
* The student must take the same number of classes each semester (i.e. a constant number).

**Assumptions:**

1. Your program should accept all of the courses (by course ID) required for the degree along with their prereqs.   It should then schedule the first semester (assuming the student will take a full course load).
2. Remember the design of the system is intended to work for ANY program so you need to use facts for the different classes and the rules manipulate the facts (i.e. don't hard-code classes in all over the place).  You should also NOT use any salience.

# Before Beginning: Install CLIPS

*Make sure to install CLIPS, if you haven’t already.*

**Name:**

# Section 1: Representing Knowledge as Facts

*Answer the following questions underneath each question using this blue font color. You may want to look at programming them in CLIPS (because you will program it in section 2 of this assignment).*

1. Show how to represent the knowledge of EACH of the prereqs for the classes.

(COURSE $?Prereq1)

1. Show how to represent the knowledge of EACH of the required classes in the degree. Remember to include IT Electives and General Education classes.

($?DEGREE $?COURSEID)

1. Show how you would represent the knowledge of a **scheduled semester of courses.** Consider what also needs to be included to be able to make sure other conditions are met.

(SEMESTER $?num $?year $?NUM-CLASSES $?COURSEID1 $?COURSEID2 $?COURSEID3 )

1. Show how to represent the number of classes a student will take each semester. Remember this is a constant.

(NUM-CLASSES 2)

(NUM-CLASSES 4)

1. Is there any other knowledge needed to be represented for this program? If so, provide it. If not, explain what would need to be represented based upon removing the simplifications.

It will need the degree for the classes, the required classes, which semester is the classes are being taken, what year the semester is being taken, and the classes scheduled for that semester. It will also help to have rules to show prereqs for each semester.

# Section 2: Creating the Facts in CLIPS

*Program in CLIPS (provide the created program). At this point, the end-user (your instructor) does not provide any input to the program when it runs.*

1. Your name, course, semester and year each on separate lines as comments at the top. Include any relevant comments on how to run the program (i.e. deffacts must have reset called).
2. Rule(s) needed to assert the courses needed for the degree. You can use deffacts if you’d like.

Graphical user interface

Description automatically generated

1. Rule(s) needed to assert the prereqs for the courses. You can use deffacts if you’d like.

Graphical user interface

Description automatically generated

# Section 3: Creating Rules to Print in CLIPS

*Program in CLIPS (provide the created program). At this point, the end-user (your instructor) does not provide any input to the program when it runs. Make sure all of the courses needed to print the degree print together (i.e. one after another). All of the prereqs should also print together.*

1. Rule to print the courses needed for the degree

Graphical user interface, Word

Description automatically generated

1. Rule to print the prereqs

Graphical user interface

Description automatically generated

1. Use good programming practices (appropriate comments, naming conventions, indenting, etc.)
2. Answer the following question: What’s the importance of the representation of knowledge? Give at least 2 reasons of the importance.

How we represent knowledge is how a computer can take the information we give it and is able to sort through facts using rules to give the correct activations. If we represent course using COURSE and the number of the course, we can have AI run through all the courses in a database and give matches to that specific COURSE and COURSEID.

Another good reason is that if there is representation of knowledge, other people should be able to look at the facts and understand what they mean and what they represent. Then when looking at the type of rules that are implemented, they should be able to trace through and find which facts have activations to each rule.

The main purpose of these expert systems is to teach machines how to use that knowledge so it can act more human.