CSE341 – Programming Languages (Fall 2018)

Homework #3

Handed out: 2:00pm Wednesday December 5, 2018.

Due: 11:55pm Tuesday December 25, 2018.

Hand-in Policy: Source code and documentation should be submitted online as a single .zip or .rar file with naming convention studentid_lastname_firstname_h3.zip via Moodle by the submission deadline. No late submissions will be accepted.

Collaboration Policy: No collaboration is permitted. Any cheating (copying someone elses work in any form) will result in a grade of -100 for the first offense and -200 for the subsequent attempts.

Grading: Each homework will be graded on the scale 100. Unless otherwise noted, the questions/parts will be weighed equal.

Part 1. [50pt] In this part of the homework, you are asked to write a simple expert system in Prolog for scheduling of classes. In your expert system, you will have rooms, courses and people.

- A room has an ID, capacity (how many people it can hold), and operations hours given in one-hour increments from 8am till 5pm. Occupancy information for a room includes the hour and the name of the course taking that hour. A room can also have special equipment such as a projector, a smart board and access for the handicapped.
- A course has an ID, an instructor, capacity, and one or more hours and the room information if they are assigned to a room. A course can have several students enrolled in it. A course can also have special needs such as a projector or a smart board. Of course, if there is a special needs student enrolled, it should be assigned to a room with proper access for the special needs.
- An instructor has an ID and several courses taught. The instructor may have preferences for rooms with a projector or smartboard.
- A student has an ID, and list of courses she/he attends. A student can also be handicapped.

Your expert system should be able to add a new student, course or a room to the system. It should respond to queries such as:

- Check whether there is any scheduling conflict.
- Check which room can be assigned to a given class.
- Check which room can be assigned to which classes.
- Check whether a student can be enrolled to a given class.
- Check which classes a student can be assigned.

-planda çakışma kontrolü
-hangi sınıf bu derse atanabilir (special need kontrolü)
-hangi derse hangi sınıf atanabilir

-öğrenci bu derse kaydolabilir mi
-Bir öğrenci hangi sınıflara atanabilir

Part 2. In the graph below you see the possible flights between some of the cities in Turkey. Write the predicate "route(X,Y,C) – a route between X and Y exists with cost C" that checks if there is a route between any given two cities.
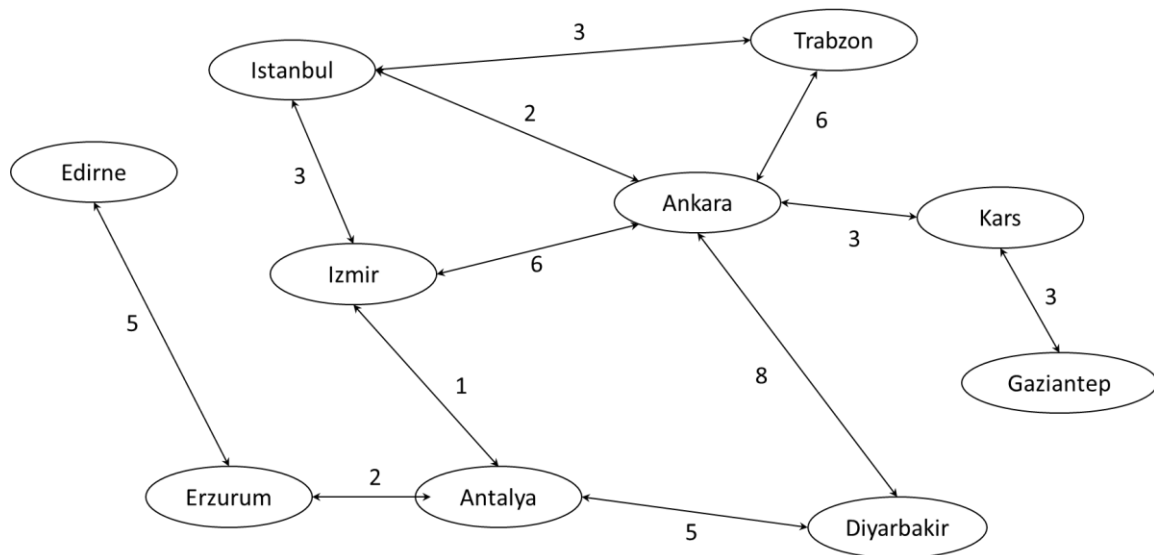
Your Prolog program should have all the facts and predicates/rules. See the following:

% knowledge base

…

flight(istanbul,izmir,3). % fact: Istanbul and Izmir has a flight with cost 3.

…

% rules

…

route(X,Y,C) :- flight(X,Y,C). % a predicate indicating there exist a route between

% X and Y if there is flight between X and Y with cost

% C.

…

A single query to complete your program should check if there is a direct route between two given cities. Alternatively, it can list all the connected cities for a given city. See the following:

?- route(edirne,X,C).

X = erzurum, C = 15 ;

X = antalya, C = 7 ;

…