CS F214 (LOGIC IN COMPUTER SCIENCE)

Assignment 1 (Prolog)

1. Create a well-commented knowledge base in Prolog for the given US Constitution document. The document consists of information about different bodies of the US government. Loading the knowledge base should be able to perform queries for the structure of the government, the power of different bodies of government, the various criteria for candidates to be eligible for a position, etc. as given in the document.

   Implement using recursive functions, lists and arithmetic wherever required.

   You must submit a PL file. The knowledge base should follow the following format:

```
/*
NAME:
ID:
*/

---------- Facts copied for implementation of test cases----------

% ARTICLE 1
% Section 1

---------- Statements for Section 1----------------------------------------

% Section 2

---------- Statements for Section 2----------------------------------------
…
…
...
---------- Statements for Amendment 27---------------------------------

% END
```

   i. Mention your name and ID within comments as shown.
   ii. The sections should be in the order given in the document.
   iii. You may make changes for the amendments specific to certain sections in the section/article itself if needed. However, mention 'Changes due to Amendment XX' in comments for the section/article.
   iv. Write 'END' within comments at the end of the file.
   v. The file should be neat and readable. You may add any other comments between your statements to make the file more readable.
   vi. Name the PL file with your ID as 20XXXXXXXXXXP_KB.pl

   [15 marks]

2. The knowledge base should be able to give corrects results for the given test queries. To be able to implement them add the following facts to the knowledge base:

```
/* age/2 gives the age and citizen/2 gives the years of citizenship of a person */

age(rohan, 23).

citizen(rohan, 23).

age(meera, 30).

citizen(meera, 8).

age(david, 35).

citizen(david, 35).

age(leonard, 40).

citizen(leonard, 40).

age(amy, 38).

citizen(amy, 5).


stateOfUS(newHampshire).

stateOfUS(massachusetts).

stateOfUS(connecticut).

stateOfUS(newYork).

stateOfUS(newJersey).

stateOfUS(pennsylvania).

stateOfUS(delaware).

stateOfUS(maryland).

stateOfUS(virginia).

stateOfUS(northCarolina).

stateOfUS(southCarolina).

stateOfUS(georgia).


monday(7, 1, 2019).

monday(2, 12, 2019).
```

The test queries to be performed on the knowledge base are:

- qualified(X, houseOfRepresentatives).
  qualified/2 has the names of those in first argument who are qualified for an election/appointment for the position in second argument

- power(congress, X).
  power/2 should have the all the powers of the govt. body in first argument as second argument
- executivePower(X).
  X should be the govt. body that has been vested executive power
- right(george, X).
  X are the rights of a citizen in the first argument
- protectionAgainstInvasion(georgia).
  Should be true if United States is liable to protect the atom given as the argument
- commanderInChiefOfArmy(X).
  X should be the appropriate govt. body
- power(X, grant(pardon(offenseAgainstUS))).
- power(northCarolina, collect(tax)).
- presidentOfSenate(X).
  X should be the appropriate govt. body
- meetingOfCongress(D, M, 2019).
  Arguments are date for when the congress should assemble

Perform the queries in the console and submit a PDF file consisting of the screenshot of the results along with the traces for each test query. Name the PDF file with your ID as 20XXXXXXXXXP_TQ.pdf

[5 marks]

3. There will be a viva based on the assignment and the tutorials based on Prolog **[20 marks]**

Submission Instructions:

- **YOU WILL BE GIVEN WITH A LINK TO SUBMIT YOUR ASSIGNMENT OVER NALANDA.**
- **ONLY ONE STUDENT PER GROUP SHOULD SUBMIT THE ASSIGNMENT ON THE GROUP'S BEHALF.**
- **THE SUBMISSION DEADLINE IS 5 PM OCT 11.**
- **PLEASE PUT ANSWERS TO Q1 AND Q2 IN A SINGLE ZIP FILE AND UPLOAD IT AT THE SUBMISSION LINK.**