Assignment 5

Ques:-You have to build a small natural language interface in Python that will provide inputs to your elective advisory system developed in Prolog. Make it effective and interesting, but keep it simple.

Code of natural language interface in Python:-

```
import nltk
from nltk.tokenize import word_tokenize
from nltk.stem import PorterStemmer
from pyswip import Prolog
#from pyswip.core import *
from pyswip.prolog import Prolog
from nltk import download
nltk.download('punkt')

swipl = Prolog()
swipl.consult("C:/Users/Sakshi/Desktop/AI/Assignment5/AI-A5-Sakshi_Kumari-MT21141/advisor
ySystem1.pl")

#taking user input for advisory system and processing it using nlp concept

#first input
inplist = []
inp1 = input("Are you interested in knowing the details of computer how it work or just happy
with using it?(yes/no)")
tok1 = word_tokenize(inp1)
print("\n\n...tokens are ...", tok1)

ps = PorterStemmer()
for wod in tok1:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'w')
if 'yes' in inplist or 'no' in inplist:
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    f.write("computer_systems({}).".format(inplist[0]))

#second input

inplist = []
inp2 = input("What would you prefer working on a computer or working
manually?(computer,manually)")
tok2 = word_tokenize(inp2)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'computer' in inplist or 'manually' in inplist:
    print("computer")
    f.write("\ncomputer_or_manually({}).".format(inplist[0]))



#third input
inplist = []
inp3 = input("Are you better in solving problems?(solving_problem,
solved_problem_as_application)")
tok2 = word_tokenize(inp3)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'solving_problem' in inplist or 'solved_problem_as_application' in inplist:
    print("computer")
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    f.write("\nbetter_in_solving_problem({}).".format(inplist[0]))

#fourth input

inplist = []
inp4 = input("Do you like dealing with numbers like manipulating it playing around it ?(yes,no)")
tok2 = word_tokenize(inp4)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\nwork_with_numbers({}).".format(inplist[0]))

#fivth input
inplist = []
inp5 = input("Would you like to develop technology or like to simply apply it?(apply, develop)")
tok2 = word_tokenize(inp5)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'apply' in inplist or 'develop' in inplist:
    print("computer")
    f.write("\ntechnology({}).".format(inplist[0]))

#sixth input
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```
inplist = []
inp6 = input("Do you have interest in Maths?(yes,no)")
tok2 = word_tokenize(inp6)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\nmaths({}).".format(inplist[0]))

#seventh input
inplist = []
inp7 = input("Are you interested in dealing with circuits and learning more about it?(yes,no)")
tok2 = word_tokenize(inp7)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\ndeal_with_circuits({}).".format(inplist[0]))

#eigth input
inplist = []
inp8 = input("Do you have interest in chemistry?(yes,no)")
tok2 = word_tokenize(inp8)
print("\n\n...tokens are ...", tok2)
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```
ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\nchemistry({}).".format(inplist[0]))

#ninth input
inplist = []
inp9 = input("Do you have interest in physics?(yes,no)")
tok2 = word_tokenize(inp9)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\nphysics({}).".format(inplist[0]))

#tenth input
inplist = []
inp9 = input("Do you have interest in biology?(yes,no)")
tok2 = word_tokenize(inp9)
print("\n\n...tokens are ...", tok2)

ps = PorterStemmer()
for wod in tok2:
    print("\n..word is..",wod)
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    stem1 = ps.stem(wod)
    print("...stem is ...", stem1)
    inplist.append(wod)

print("\n.. list is ", inplist)

f = open("Afacts.txt", 'a')
if 'yes' in inplist or 'no' in inplist:
    print("computer")
    f.write("\nbiology({}).".format(inplist[0]))

f.close()
```

Output of python file generated as natural language interface:-

```
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:\Users\Sakshi\Desktop\AI\Assignment5\AI-A5-Sakshi_Kumari-MT21141\advisorySystemInterface.py
[nltk_data] Downloading package punkt to
[nltk_data]     C:\Users\Sakshi\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
Are you interested in knowing the details of computer how it work or just happy with using it?(yes/no)yes


...tokens are ... ['yes']

..word is.. yes
...stem is ... ye

.. list is  ['yes']
What would you prefer working on a computer or working manually?(computer,manually)computer


...tokens are ... ['computer']

..word is.. computer
...stem is ... comput

.. list is  ['computer']
computer
Are you better in solving problems?(solving_problem, solved_problem_as_application)solving_problem


...tokens are ... ['solving_problem']

..word is.. solving_problem
...stem is ... solving_problem

.. list is  ['solving_problem']
computer
Do you like dealing with numbers like manipulating it playing around it ?(yes,no)yes


...tokens are ... ['yes']

..word is.. yes
...stem is ... ye

.. list is  ['yes']
computer
Would you like to develop technology or like to simply apply it?(apply, develop)develop
```

```
..word is.. develop
...stem is ... develop

.. list is  ['develop']
computer
Do you have interest in Maths?(yes,no)yes


...tokens are ... ['yes']

..word is.. yes
...stem is ... ye

.. list is  ['yes']
computer
Are you interested in dealing with circuits and learning more about it?(yes,no)no


...tokens are ... ['no']

..word is.. no
...stem is ... no

.. list is  ['no']
computer
Do you have interest in chemistry?(yes,no)no


...tokens are ... ['no']

..word is.. no
...stem is ... no

.. list is  ['no']
computer
Do you have interest in physics?(yes,no)no


...tokens are ... ['no']

..word is.. no
...stem is ... no

.. list is  ['no']
computer
Do you have interest in biology?(yes,no)no
```

```
...tokens are ... ['no']

..word is.. no
...stem is ... no

.. list is  ['no']
computer
```

.txt File generated from python code:-

computer_systems(yes).
computer_or_manually(computer).
better_in_solving_problem(solving_problem).
work_with_numbers(yes).
technology(apply).
maths(yes).

deal_with_circuits(no).
chemistry(no).
physics(no).
biology(yes).

Prolog code of Advisory System:-
%Modify the assignment 1 prolog code

```
% Made advisory system for Btech level stream selection based on some
% question asked to students/users. System will recommend the best
% suitable stream for user based on user_responses.For running this
% program simply consult the file in prolog and then type systems.

% starting of program
% it will calls different function and determine the suitable stream based on the user response
and
% also suggest some career path users can take after completion of the particular
stream/course.

systems :-
  %this file is generated by the python code and it contains facts about the user interest.
  consult("C:/Users/Sakshi/Desktop/AI/Assignment5/AI-A5-Sakshi_Kumari-MT21141/Afacts.txt"),
  start,
  find_stream(Stream).

start :-
  write('In which stream sholud I pursue in my B.Tech?'), nl.

% function for finding the suitable stream for student when he respond to some questions asked
find_stream(Stream) :-
  stream(Stream), !.

%btech_streams
% Btech_stream finding, it will asks some question to you and give the suitable response
according to your answer
% function called for different programs like cse,it,ece,me etc.

stream(computer_science) :-
  computer_systems(yes),
  computer_or_manually(computer),
  (better_in_solving_problem(solving_problem)),
  work_with_numbers(yes),
  (technology(develop);technology(apply)),
```

```
  maths(yes),
  deal_with_circuits(no),
  (chemistry(yes);chemistry(no)),
  (physics(yes);physics(no)),
  (biology(yes);biology(no)),
  write('Recommendation: Computer Science '),nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
  write('- Software Engineer'),nl,
  write('- System Engineer'),nl,
  write('- App Developer'),nl,
  write('- Game Developer'),nl,
  write('- Network Specialist'),nl,
  write('- Researcher'),nl,
  write('- Software Quality Assurance Engineer'),nl.

stream(information_technology) :-
  computer_systems(yes),
  computer_or_manually(computer),
  (better_in_solving_problem(solved_problem_as_application)),
  (work_with_numbers(yes);work_with_numbers(no)),
  technology(apply),
  maths(yes),
  deal_with_circuits(no),
  (chemistry(yes);chemistry(no)),
  (physics(yes);physics(no)),
  (biology(yes);biology(no)),
  write('Recommendation: Information Technology '),nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
 write('- Network Administrator'),nl,
  write('- Computer Support Specialist'),nl,
  write('- Information Technology Manager'),nl,
  write('- Database Administrator'),nl,
  write('- System Administrator'),nl,
  write('- Information Systems Manager.'),nl.

stream(electronic_engineering) :-
  computer_systems(no),
  computer_or_manually(manually),
  better_in_solving_problem(solving_problem),
  (work_with_numbers(yes);work_with_numbers(no)),
  technology(apply),
  maths(yes),
  deal_with_circuits(yes),
  (chemistry(yes);chemistry(no)),
```

```
  (physics(yes);physics(no)),
  (biology(yes);biology(no)),
  write('Recommendation: Electrical/Electronic Engineering '),
  nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
  write('- Electrical or Electronic Engineer'),nl,
  write('- Technical Director'),nl,
  write('- Network Planning Engineer'),
  write('- Desktop Support Engineer'),nl,
  write('- Electronics Device and Development Engineer').

stream(mechanical_engineering) :-
  computer_systems(no),
  computer_or_manually(manually),
  better_in_solving_problem(solved_problem_as_application),
  work_with_numbers(yes),
  technology(apply),
  maths(yes),
  deal_with_circuits(no),
  (chemistry(yes);chemistry(no)),
  (physics(yes)),
  (biology(yes);biology(no)),
  write('Recommendation: Mechanical Engineering '),
  nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
  write('- Mechanical Engineer'),nl,
  write('- Production Engineer'),nl,
  write('- Failure Analyst Engineer'),nl,
  write('- M&E Engineer'),nl,
  write('- QC Engineer'),nl,
  write('- Manufacturing Engineer'),nl,
  write('- R&D Engineer'),nl,
  write('- Design Engineer'),nl,
  write('- Product Engineer').

stream(chemical_engineering) :-
  computer_systems(no),
  computer_or_manually(manually),
  better_in_solving_problem(solved_problem_as_application),
  work_with_numbers(no),
  technology(apply),
  (maths(yes);maths(no)),
  deal_with_circuits(no),
  chemistry(yes),
```

```
  (physics(yes);physics(no)),
  (biology(yes);biology(no)),
  write('Recommendation: Chemical Engineering '),
  nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
  write('- Process Engineer'),nl,
  write('- Quality Assurance Engineer'),nl,
  write('- Chemical & Biochemical Engineer'),nl,
  write('- Contamination Engineer').

stream(biotechnology) :-
  computer_systems(no),
  computer_or_manually(manually),
  better_in_solving_problem(solved_problem_as_application),
  work_with_numbers(no),
  technology(apply),
  biology(yes),
  chemistry(yes),
  (maths(yes);maths(no)),
  (physics(yes);physics(no)),
  write('Recommendation: Biotechnology '),
  nl,
  write('After completion of recommended stream you can choose below career path:'),nl,
  write('- Pharmaceutical Research & Development'),nl,
  write('- Pharmaceutical Marketing Director'),nl,
  write('- Clinical Trial Manager'),nl,
  write('- Clinical Research Scientist'),nl,
  write('- Biomedical & Biotechnology Research Scientist'),nl,
  write('- Medical & Scientific Product Specialist'),nl,
  write('- Medical Laboratories Director'),nl,
  write('- Academia (Science Educator)').

stream(_):- write("Sorry no suitable Stream found").
```

Output of Advisory System:-