CSE 643
Artificial Intelligence
Assignment 5

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Creating an NLP interface in python for the Electives advisory system in Prolog

STEP 1:

Importing required libraries and installing dependencies

```
import nltk
#nltk.download('punkt')
from nltk.tokenize import word_tokenize
from nltk.stem import PorterStemmer
from pyswip import Prolog
import pandas as pd
import io
from pyswip import Functor, Variable, Query, call
import re
swipl = Prolog()
```

STEP 2:

Formatting and cleaning text:

a. Moving all the text to lower case
b. Remove question marks, commas, apostrophes etc and replace them with a space
c. Tokenize the sentence into individual words
d. Using stemming simplifying words

```
def format_text(text):
    text = text.lower()

    text = re.sub(r"([^0-9A-Za-z \t])|(\w+:\/\/\S+)|^rt|http.+?", " ", text)

    text = re.sub(r'\s+', ' ', text)

    text=word_tokenize(text)
    text_out = []
    stemmer = PorterStemmer()
    for word in text:
        word = stemmer.stem(word)
        text_out.append(word)
    text_out = list(set(text_out))

    return text_out
```

STEP 3:

Checking the data for key words and abbreviations-:

a. Writing corresponding facts in a temp.pl named file.

STEP 4:

Asking appropriate questions to make facts complementing important facts from the prolog file.

```
i=input("Please enter your interest :- math , sde , ai_ml , data_science , bio , cyber_sec , elec , ui_ux , eco , hum , psy , ")
interest=format_text(i)
print(interest)
for z in interest:
    if z == 'maths' or z =='mathematics' or z =='math':
        f.write(f'interest({"math"}).\n')
        break
    elif z == 'software' or z =='sde' :
        f.write(f'interest({"sde"}).\n')
        break
    elif z =='ai' or z =='ml' or z =='artificial' or z =='machine':
        f.write(f'interest({"ai_ml"}).\n')
        break
    elif z == 'data' or z =='science' :
        f.write(f'interest({"data_science"}).\n')
        break
    elif z == 'bio' or z =='biology':
        f.write(f'interest({"bio"}).\n')
        break
    elif z == 'cyber' or z =='security':
        f.write(f'interest({"cyber_sec"}).\n')
        break
```

A snippet of the Working program:

```
-------------------------------------------------------------------------------------------
Electives Advisory System
-------------------------------------------------------------------------------------------
----------By Shoumik Lodh - Roll no 2020407
What year are you currently studying in ? (1st , 2nd, 3rd, 4th or MTECH ?)
I am currently studying in third year
Please enter your interest :- math , sde , ai_ml , data_science , bio , cyber_sec , elec , ui_ux , eco , hum , psy ,
I have great interest in maths!
what is your plan? Aiming for campus placements or Higher Studies?
Currently aiming for campus placements and job offer
If you have done a project enter topic :- math , sde , ai_ml , data_science , bio , cyber_sec , elec , ui_ux , eco , hum , psy
 or enter no
Yes a project in machine learning
Is your CGPA above 8 or less than 8
it is above 8
```

After the user enters his prompts, a separate pl fact file is created based on the responses which is then consulted in the prolog program:-
Here is a sample of the temp fact file created:

temp.pl

```
1  year(3).
2  interest(math).
3  plans(1).
4  projects(ai_ml).
5  extra(y).
6  gpa(1).
```

Function consulting this file in the prolog code:

```
check:-
    consult("temp.pl")
```

```
?- main.


Note mandatory courses for placement
ada , dsa , os , dbms ,


Your GPA is fine!
these are the recommended courses based on your inputs(priority wise) :


tnt , cmpa , sc , ra2 , spa , ita ,

and their respective mandatory pre-requisites to be completed are


nt , ra1 , m1 , ra1 , pns , m4 ,

true
```

Given that the user inputted jobs, the portal suggested **mandatory courses for placement**: ada, dsa, os and dbms.
Now the user has interest in maths and has done project in ml,
He is suggested **technical maths courses** like Scientific Computing, Real Analysis, Number theory and other math courses.
Also suggested are their **respective pre-requisites** (if any, else left blank).