

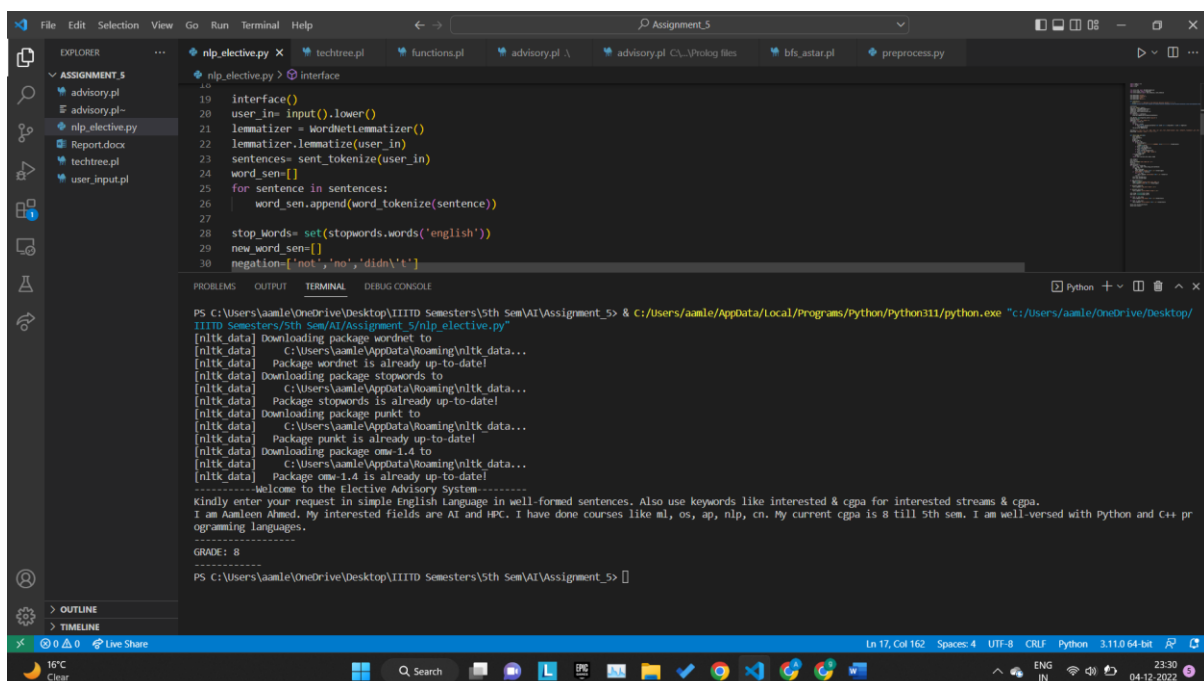
Assignment 5 – NLP + Prolog

Artificial Intelligence

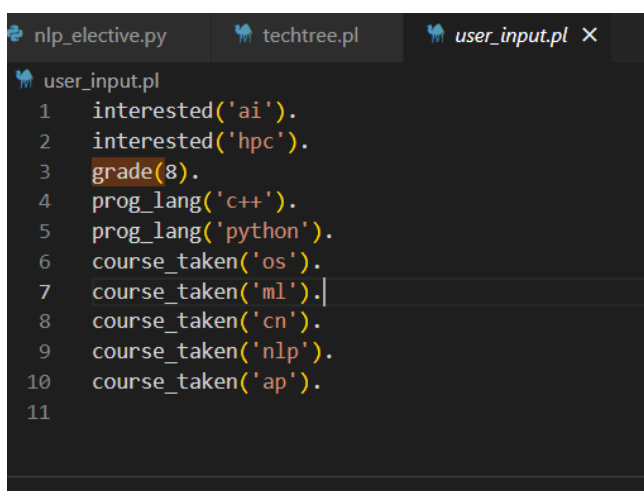
Instructions to work

Run python file first (nlp_electives.py). It will ask for user input, which you can provide in your simple english language. You just need to mention your interested stream in 1 sentence, and cgpa in 1 sentence. The highlighted words are keywords, along with any of their related words, so use them for the program to detect accordingly. Rest courses provided will be prerequisites.

Now once python file is completed, open prolog and consult and run the advisory.pl file. Change the path of other consulted files first. Then just write start. to start the elective advisory. Keep pressing ‘;’ after outputs to continue for next interested fields, unless Thank you message is printed.

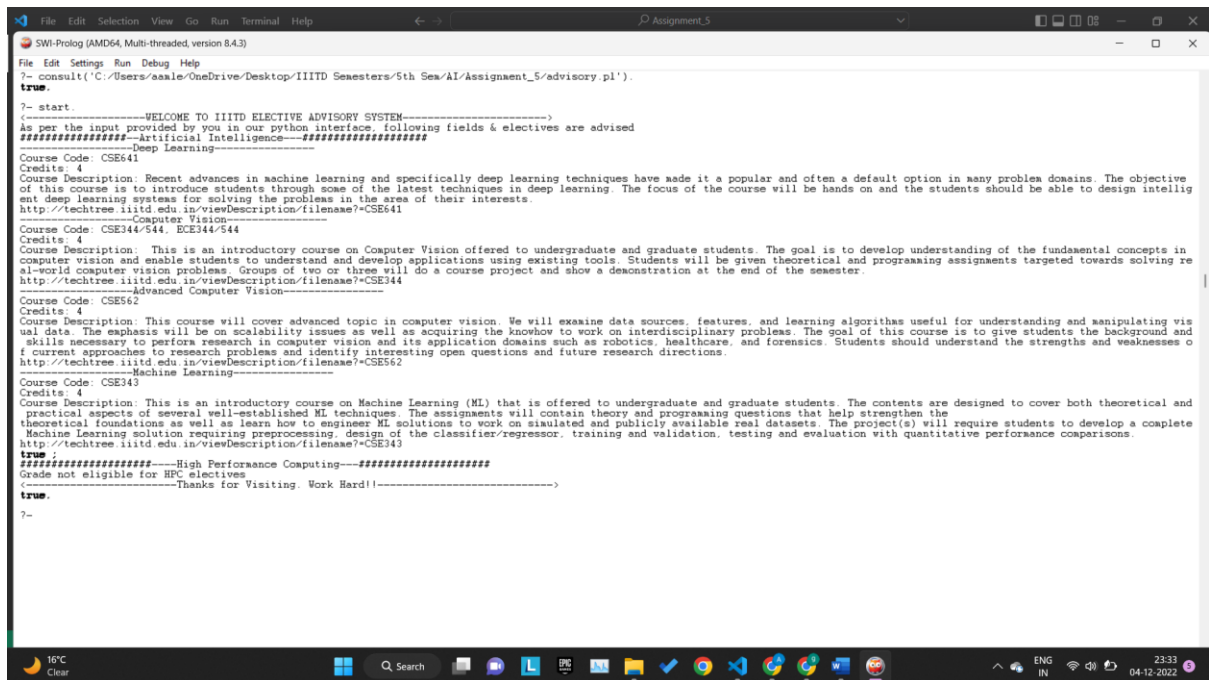


```
File Edit Selection View Go Run Terminal Help
Assignment_5
EXPLORER
  ASSIGNMENT_5
    advisory.pl
    advisory.pl~
    nlp_elective.py
    Report.docx
    techtree.pl
    user_input.pl
nlp_elective.py
  18 interface
  19 user_in = input().lower()
  20 lemmatizer = WordNetLemmatizer()
  21 lemmatizer.lemmatize(user_in)
  22 sentences = sent_tokenize(user_in)
  23 word_sen=[]
  24 for sentence in sentences:
  25     word_sen.append(word_tokenize(sentence))
  26
  27 stop_words = set(stopwords.words('english'))
  28 new_word_sen=[]
  29 negation=['not','no','didn\'t']
  30
  PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
  Python
  PS C:\Users\Aamle\OneDrive\Desktop\IIITD Semesters\5th Sem\AI\Assignment_5> & C:\Users\Aamle\AppData\Local\Programs\Python\Python311\python.exe "c:\Users\Aamle\OneDrive\Desktop\IIITD Semesters\5th Sem\AI\Assignment_5\nlp_elective.py"
  [nltk data] Downloading package wordnet to
  C:\Users\Aamle\AppData\Roaming\nltk_data...
  [nltk data] Package wordnet is already up-to-date!
  [nltk data] Downloading package stopwords to
  C:\Users\Aamle\AppData\Roaming\nltk_data...
  [nltk data] Package stopwords is already up-to-date!
  [nltk data] Downloading package punkt to
  C:\Users\Aamle\AppData\Roaming\nltk_data...
  [nltk data] Package punkt is already up-to-date!
  [nltk data] Downloading package omw-1.4 to
  C:\Users\Aamle\AppData\Roaming\nltk_data...
  [nltk data] Package omw-1.4 is already up-to-date!
  -----Welcome to the Elective Advisory System-----
  Kindly enter your request in simple english language in well-formed sentences. Also use keywords like interested & cgpa for interested streams & cgpa.
  I am Aamleen Ahmed. My interested fields are AI and HPC. I have done courses like ml, os, ap, nlp, cn. My current cgpa is 8 till 5th sem. I am well-versed with Python and C++ pr
  ogramming languages.
  -----
  GRADE: 8
  PS C:\Users\Aamle\OneDrive\Desktop\IIITD Semesters\5th Sem\AI\Assignment_5>
```



```
nlp_elective.py techtree.pl user_input.pl X
user_input.pl
1 interested('ai').
2 interested('hpc').
3 grade(8).
4 prog_lang('c++').
5 prog_lang('python').
6 course_taken('os').
7 course_taken('ml').
8 course_taken('cn').
9 course_taken('nlp').
10 course_taken('ap').
11
```

Facts file generated by NLP program



```
File Edit Selection View Go Run Terminal Help
SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)
File Edit Settings Run Debug Help
?- consult('C:/Users/aamle/OneDrive/Desktop/IIITD Semesters/5th Sem/AI/Assignment_5/advisory.pl').
true.
?- start.
-----WELCOME TO IIITD ELECTIVE ADVISORY SYSTEM-----
As per the input provided by you in our python interface, following fields & electives are advised
*****--Artificial Intelligence-----*****
*****--Deep Learning-----*****
Course Code: CSE641
Credits: 4
Course Description: Recent advances in machine learning and specifically deep learning techniques have made it a popular and often a default option in many problem domains. The objective of this course is to introduce students through some of the latest techniques in deep learning. The focus of the course will be hands on and the students should be able to design intelligent deep learning systems for solving the problems in the area of their interests.
http://techtree.iiitd.edu.in/viewDescription/filename?*=CSE641
*****--Computer Vision-----*****
Course Code: CSE344/544, ECE344/544
Credits: 4
Course Description: This is an introductory course on Computer Vision offered to undergraduate and graduate students. The goal is to develop understanding of the fundamental concepts in computer vision and enable students to understand and develop applications using existing tools. Students will be given theoretical and programming assignments targeted towards solving real-world computer vision problems. Groups of two or three will do a course project and show a demonstration at the end of the semester.
http://techtree.iiitd.edu.in/viewDescription/filename?*=CSE344
*****--Advanced Computer Vision-----*****
Course Code: CSE562
Credits: 4
Course Description: This course will cover advanced topic in computer vision. We will examine data sources, features, and learning algorithms useful for understanding and manipulating visual data. The emphasis will be on scalability issues as well as acquiring the knowhow to work on interdisciplinary problems. The goal of this course is to give students the background and skills necessary to perform research in computer vision and its application domains such as robotics, healthcare, and forensics. Students should understand the strengths and weaknesses of current approaches to research problems and identify interesting open questions and future research directions.
http://techtree.iiitd.edu.in/viewDescription/filename?*=CSE562
*****--Machine Learning-----*****
Course Code: CSE343
Credits: 4
Course Description: This is an introductory course on Machine Learning (ML) that is offered to undergraduate and graduate students. The contents are designed to cover both theoretical and practical aspects of several well-established ML techniques. The assignments will contain theory and programming questions that help strengthen the theoretical foundations as well as learn how to engineer ML solutions to work on simulated and publicly available real datasets. The project(s) will require students to develop a complete Machine Learning solution requiring preprocessing, design of the classifier/regressor, training and validation, testing and evaluation with quantitative performance comparisons.
http://techtree.iiitd.edu.in/viewDescription/filename?*=CSE343
true.
*****--High Performance Computing-----*****
Grade not eligible for HPC electives
-----Thanks for Visiting. Work Hard!!-----
true.
?-
```

Coding Procedure/Planning

Step 1: Started by taking input from the user.

Step 2: Preprocessing → Using various NLP libraries, preprocessed the data to extract meaningful tokens. In detail steps:

- Downloaded words, stoping words (general connecting words and all), and punctuation marks.
- Using lemmatizer, simplified the input to club multiple words of the same origin (root word) to be grouped under single root word. This will help us in reducing the data & just giving the context by the root words.
- Now tokenizing the input into sentences, and then further extracting each word as token from each sentence. Words of same sentence are stored in one list, and together all sentences form nested list.
- Next, removed the stopping words to simplify the data and remove any useless words. Avoided negation statements for proper context.
- Now using our predefined courses & programming languages, extracted the course choice and interested stream of user. Also took input of cgpa in 1 of the sentences. If not provided, cgpa input is taken separately.
- Now just writing all of this data as facts:
 - Interested() : contains the fields which interests user
 - Course_taken() : specifies the courses done by user already
 - Prog_lang() : specifies the user's programming languages known.
 - Grade() : specifies the user grade between 1-10, integer only.
- Now output file (user_input.pl) is ready

Step 3: Prolog-> Now consulting the user_input.pl file for input facts made using NLP, and also techtree.pl that contains all the course details.

Step 4: In prolog, checking for the interests of user, then checking for prereq courses done, and then grade requirement. If all requirements are met, then electives to be taken are shown else appropriate message is shown.
