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AI assignment-1

Career Advisory System for an IIITD B.Tech Student

Description of the system

This system:

1. Helps the user to find his core interest.
2. Helps the user to figure out which specialization of the corresponding field would be the best fit for him.
3. Helps the user to figure out whether to go for higher studies or industrial job.

The basic architecture of the system can be as:

Start the questioning by asking about the current stream --> Ask some more questions to finalize what is the core interest --> Ask questions to finalize in which area of the core interest would the user like to work -->Ask some more questions to advise whether to go for higher studies or placements.

Some assumptions:

1. The user is an IIITD B.Tech Student.
2. The user is only interested in a tech career. Since possibilities can be endless for a nontech profile.

A glance of prolog features used:

1. Lists.
2. Backtracking.
3. Recursion.
4. Dynamic assertion.

5. Retract

Basic functionality:

- ### Prediction of core interest.

  The prediction of the core interest is decided on
  1. Current Branch.
  2. In which domain, the majority of the projects are done.
  3. In which domain, the majority of the elective courses done (Since students take electives based on their liking).
  4. Do they like working on hardware more or on in Computer Science (or in general CS-related area).
  5. I have taken into consideration that IIITD has only 2 broad streams for UG (ECE or CSE), So any given student can be either interested in ECE or in CSE.

- ### Deducing specialization.

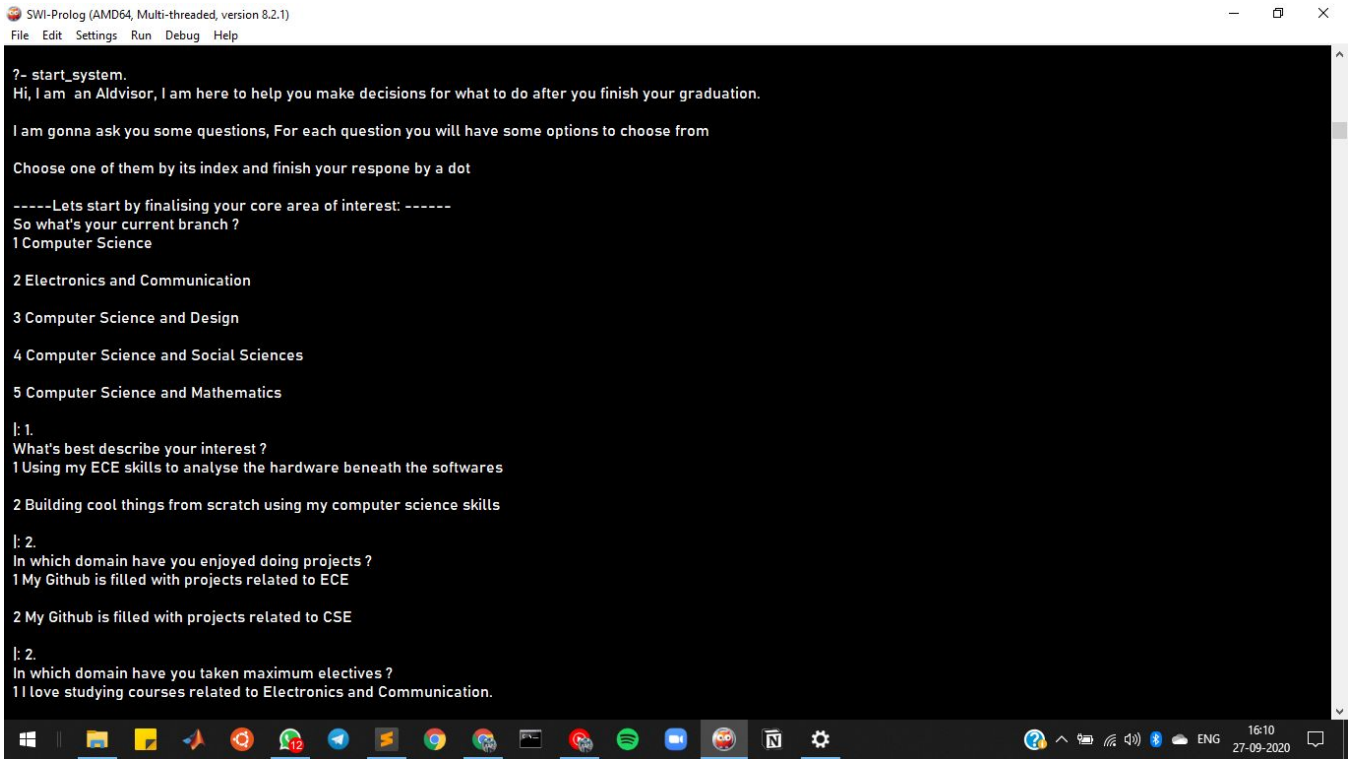
  This feature advises a specialization in the deduced core interest based on some questions.

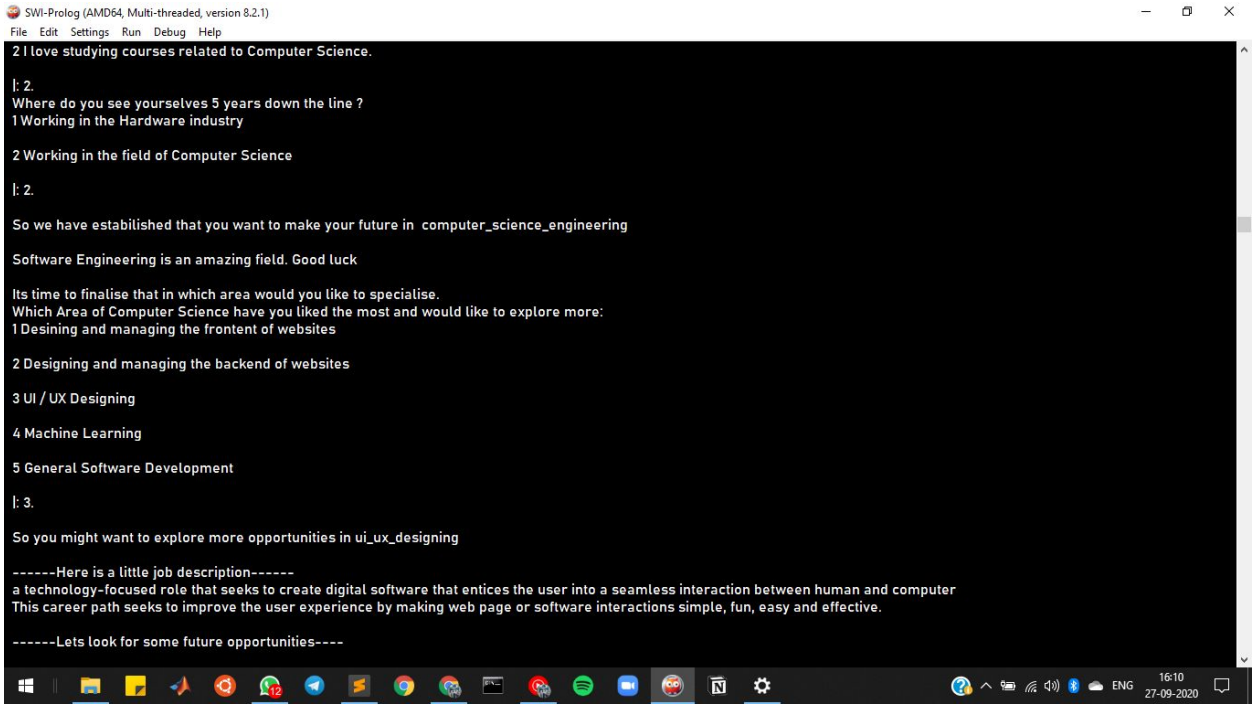
- ### Deducing future opportunities.

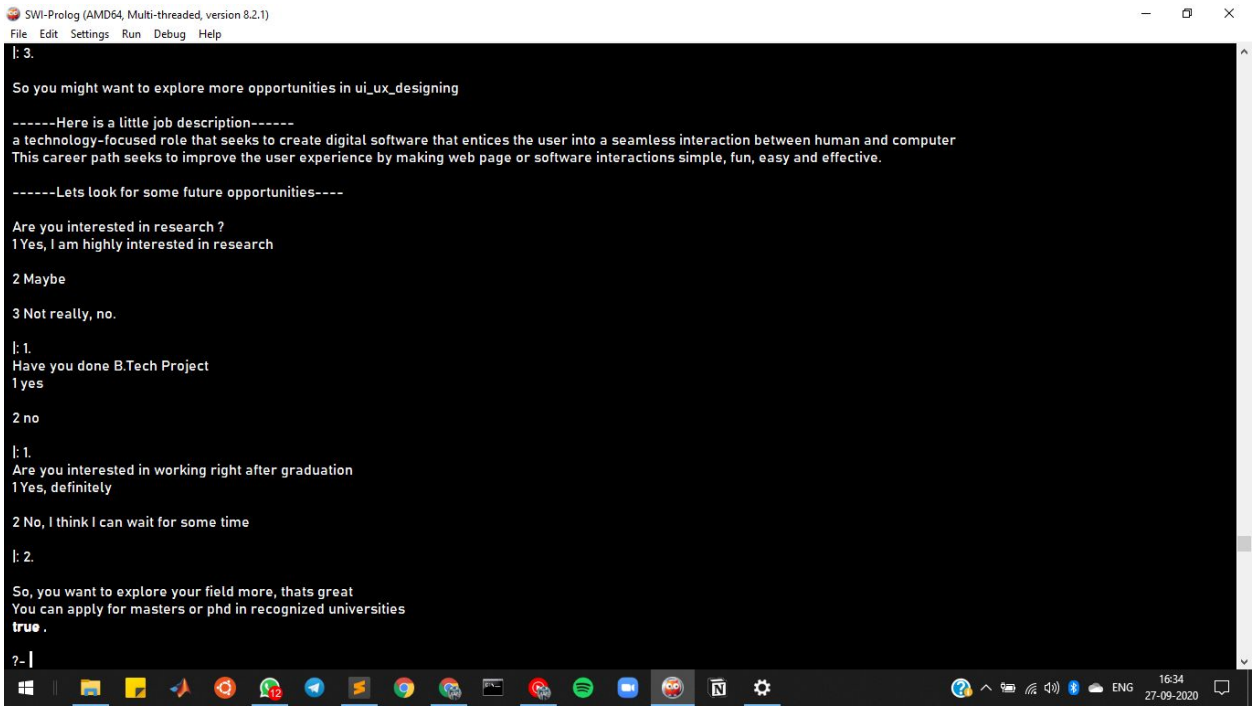
  This feature asks some questions and based on them advises on whether to go for higher studies or jobs right after graduation.

- For each question, some options would be given and the user has to choose from them only and respond by mentioning the index of the corresponding option followed by a dot to end the response.

Screenshots of working:







Source code:

```
start_system:-
        initsystem,
        reset,
        write('-----Lets start by finalising your core area of interest: ------'),nl,
        decide_core(Career),nl,
        write('So we have estabilished that you want to make your future in '),
        write(' '),
        write(Career),nl,nl,
        description(Career),nl,nl,
        write('Its time to finalise that in which area would you like to specialise.'),nl,
        choose_specialisation(Career,Choice),nl,
        write('So you might want to explore more opportunities in '),
        write(Choice),nl,nl,
        write('------Here is a little job description------'),nl,
        describe(Choice),nl,nl,
        write('------Lets look for some future opportunities----'),nl,nl,
        suggest_future(Future),nl,
        describe(Future).

start_system:-
        write('Sorry, Your choices seems too mixed up.').

initsystem:-
        write('Hi, I am  an AIdvisor, I am here to help you make decisions for what to do after
you finish your graduation.'),nl,nl,
        write('I am gonna ask you some questions, For each question you will have some options
to choose from'),nl,nl,
        write('Choose one of them by its index and finish your respone by a dot'),nl,nl.
```

```
:-dynamic(store_answers/2).

decide_core(Career):-
	career_choice(Career),!.  %TRIES FOR every possible outcome of Career and tries all the
sub queries untill one of them is satisfied.
suggest_future(Future):-
	future_options(Future),!.

reset:-
	retractall(store_answers(_,_)).

career_choice(electronics_and_communication_engineering):-
	current_branch(ece),
	interest(ece_interest),
	major_projects(ece_projects),
	%major_courses(ece_courses),
	seelater(chips).

career_choice(computer_science_engineering):-
	current_branch(_),
	interest(cse_interest),
	major_projects(cse_projects),
	major_courses(cse_courses),
	seelater(software).


choose_specialisation(Career,Choice):-
	(
		(Career==computer_science_engineering)->specialise_cse(Answer);
		(Career==electronics_and_communication_engineering)->specialise_ece(Answer)
	),
	Choice=Answer.

future_options(higher_studies):-
	(
		research(highly_interested);
		research(maybe)
	),
	btp_done(yes),
	instantwork(canwait).

future_options(industrial_job):-
	research(no_research),
	instantwork(yes_work).

future_options(research_lab):-
	(
		research(highly_interested);
		research(maybe)
	),
	instantwork(yes_work).

description(computer_science_engineering):-
	write('Software Engineering is an amazing field. Good luck').
description(electronics_and_communication_engineering):-
	write('Hardware engineers are the people behind everything. Good luck. ').
```

```
describe(higher_studies):-
	write('So, you want to explore your field more, thats great'),nl,
	write('You can apply for masters or phd in recognized universities').
describe(industrial_job):-
	write('So, you want to make your hands dirty right after graduation, thats great'),nl,
	write('You can start to apply for major industrial companies in this area'),nl,
	write('I am sure you would nail the work there too').
describe(research_lab):-
	write('Since you interested in doing research and also wants to work right after
graduation'),nl,
	write('I suggest you look for opportunities in research labs').

describe(frontend_development):-
	write('A front-end web developer is responsible for implementing visual elements that
users see and interact with in a web application'),nl.
describe(backend_development):-
	write('A back-end web developer is responsible for server-side web application logic
and integration of the work front-end web developers do'),nl.
describe(ui_ux_designing):-
	write('a technology-focused role that seeks to create digital software that entices the
user into a seamless interaction between human and computer'),nl,
	write('This career path seeks to improve the user experience by making web page or
software interactions simple, fun, easy and effective.').

describe(machine_learning_or_data_science):-
	write('Machine learning engineers feed data into models defined by data
scientists'),nl,
	write('They are also responsible for taking theoretical data science models and helping
scale them out to production-level models that can handle terabytes of real-time data'),nl,
	write('Meanwhile a job of a data scientist can be:'),nl,
	write('Collecting data through means such as analyzing business results or by setting
up and managing new studies. Transferring data into a new format to make it more appropriate
for analysis'),nl.
describe(software_development):-
	write('The one who can do everything'),nl,
	write('A Software Development Engineer (SDE) is responsible for creating cross-platform
applications and software systems, applying the principles of computer science, computer
engineering, information technology'),nl,
	write('and analysis to help organizations and individuals make informed decisions.').
describe(vlsi):-
	write('The VLSI Design Engineer is responsible for designing the functions of modules
of the system-on-chip (SOC) as per input and output specifications given').
describe(wireless_communication):-
	write('Wireless Network Engineer job description includes installing, configuring and
maintaining wireless network equipment, network management').
describe(digital_signal_processing):-
	write('A signal processing engineer is an information technologies expert that analyzes
and alters digital signals to make them more accurate and reliable').

question(current_branch):-
	write('So what''s your current branch ?'),nl.
question(interest):-
	write('What''s best describe your interest ?'),nl.
question(seelater):-
	write('Where do you see yourselves 5 years down the line ?'),nl.
question(major_courses):-
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        write('In which domain have you taken maximum electives ?'),nl.
question(major_projects):-
        write('In which domain have you enjoyed doing projects ?'),nl.
question(specialise_cse):-
        write('Which Area of Computer Science have you liked the most and would like to explore
more:'),nl.
question(specialise_ece):-
        write('Which Area of Electronics and Communication have you liked the most and would
like to explore more:'),nl.
question(research):-
        write('Are you interested in research ?'),nl.
question(instantwork):-
        write('Are you interested in working right after graduation'),nl.
question(btp_done):-
        write('Have you done B.Tech Project'),nl.

option(yes):-
        write('yes'),nl.
option(no):-
        write('no'),nl.

option(ece):-
        write('Electronics and Communication'),nl.
option(cse):-
        write('Computer Science '),nl.
option(csd):-
        write('Computer Science and Design'),nl.
option(csss):-
        write('Computer Science and Social Sciences'),nl.
option(csam):-
        write('Computer Science and Mathematics'),nl.


option(ece_interest):-
        write('Using my ECE skills to analyse the hardware beneath the softwares'),nl.
option(cse_interest):-
        write('Building cool things from scratch using my computer science skills'),nl.

option(chips):-
        write('Working in the Hardware industry'),nl.
option(software):-
        write('Working in the field of Computer Science'),nl.

option(ece_courses):-
        write('I love studying courses related to Electronics and Communication.'),nl.
option(cse_courses):-
        write('I love studying courses related to Computer Science.'),nl.

option(ece_projects):-
        write('My Github is filled with projects related to ECE'),nl.
option(cse_projects):-
        write('My Github is filled with projects related to CSE'),nl.

option(frontend_development):-
        write('Desining and managing the frontent of websites'),nl.
option(backend_development):-
        write('Designing and managing the backend of websites'),nl.
```

```
option(ui_ux_designing):-
       write('UI / UX Designing'),nl.
option(machine_learning_or_data_science):-
       write('Machine Learning / Data Science.'),nl.
option(software_development):-
       write('General Software Development'),nl.

option(vlsi):-
       write('Exploring and playing with IC/ Microprocessors'),nl.
option(wireless_communication):-
       write('Wireless, optical Communication or wireless networks'),nl.
option(digital_signal_processing):-
       write('Image and Signal Processing'),nl.

option(highly_interested):-
       write('Yes, I am highly interested in research'),nl.
option(maybe):-
       write('Maybe'),nl.
option(no_research):-
       write('Not really, no.'),nl.

option(yes_work):-
       write('Yes, definitely'),nl.
option(canwait):-
       write('No, I think I can wait for some time'),nl.

current_branch(Answer):-
       store_answers(current_branch,Answer),!.
current_branch(Answer):-
       \+ store_answers(current_branch,_),
       ask_question(current_branch,Answer,[cse,ece,csd,csss,csam]).

interest(Answer):-
       store_answers(interest,Answer),!.
interest(Answer):-
       \+ store_answers(interest,_),
       ask_question(interest,Answer,[ece_interest,cse_interest]).

seelater(Answer):-
       store_answers(seelater,Answer),!.
seelater(Answer):-
       \+store_answers(seelater,_),
       ask_question(seelater,Answer,[chips,software]).

major_courses(Answer):-
       store_answers(major_courses,Answer),!.
major_courses(Answer):-
       \+store_answers(major_courses,_),
       ask_question(major_courses,Answer,[ece_courses,cse_courses]).

major_projects(Answer):-
       store_answers(major_projects,Answer),!.
major_projects(Answer):-
       \+store_answers(major_projects,_),
       ask_question(major_projects,Answer,[ece_projects,cse_projects]).
specialise_cse(Answer):-
       store_answers(specialise_cse,Answer),!.
```

```
specialise_cse(Answer):-
       \+store_answers(specialise_cse,_),

ask_question(specialise_cse,Answer,[frontend_development,backend_development,ui_ux_designing,m
achine_learning_or_data_science,software_development]).

specialise_ece(Answer):-
       store_answers(specialise_ece,Answer),!.
specialise_ece(Answer):-
       \+store_answers(specialise_ece,_),

ask_question(specialise_ece,Answer,[vlsi,wireless_communication,digital_signal_processing]).

research(Answer):-
       store_answers(research,Answer),!.
research(Answer):-
       \+store_answers(research,_),
       ask_question(research,Answer,[highly_interested,maybe,no_research]).

instantwork(Answer):-
       store_answers(instantwork,Answer),!.
instantwork(Answer):-
       \+store_answers(instantwork,_),
       ask_question(instantwork,Answer,[yes_work,canwait]).
btp_done(Answer):-
       store_answers(btp_done,Answer),!.
btp_done(Answer):-
       \+store_answers(btp_done,_),
       ask_question(btp_done,Answer,[yes,no]).
%---------------------------------------------------------------------

ask_question(Question,Answer,Options):-
       question(Question),list_options(Options,1),read(Reply),
       find_option(Reply,Options,Selection),
       asserta(store_answers(Question,Selection)),
       Selection=Answer.

find_option(1, [Head|_] , Head).  % Base case-if the index is one then return the head of the
list.

find_option(Index, [_|Tail], Result) :-
       Nextindex is Index -1,
       find_option(Nextindex, Tail, Result).


list_options([],_).           %base case- options to be generated are empty
list_options([Head|Tail], Index):-
       write(Index), write(' '),
       option(Head), nl,
       Next is Index + 1,
       list_options(Tail, Next).
```