

# AI- Assignment 1

## Elective advisory/prediction system in Prolog for BTech or MTech students of IITD

This is an advisory system designed to help students with electives based on career choice and the prerequisite they have done.

### Input:

1. start. to start the code
2. user\_name
3. Choose any one of the available career options
4. Choose area of Interest/s from the available options
5. Enter the course code of the prerequisite courses if done any enter stop. when done

### Source Code:

```
% Type start. to run the code

:-style_check(-singleton).
:-style_check(-discontiguous).
career(1,ai, 'Artificial Intelligence').
career(2,qrs, 'Quantum Researcher').
career(3,ds, 'Data Scientist').
career(4,uiux, 'UI/UX designer').
career(5,econ, 'Economist').
career(6,na, 'Not Decided').

ssh(1,acting).
ssh(2,reading).
ssh(3,poerty).
ssh(4,history).
ssh(5,non).

start:-
    nl,write('_____ Electives advisory / prediction system for BTech or MTech student of IITD _____'),nl,
    setting_env,
    student_info,
    career_choice,
    interest_course,
    career_selected(na) ->nan,exiting;
pre_req_done(List),
print_choice_availble,
exiting.

setting_env:-
    % helper funtion used to set all facts and rules
    retractall(name(_)),
    retractall(course_done_or_not()),
    retractall(career_selected(_)),
```

```
retractall(course_chosen(_,_)),
retractall(course(_,_,_)),
retractall(course_to_print(_,_)),
retractall(pre_req(_,_)),
define_course,
define_prereq.
```

define\_course:-

```
retractall(course(_,_,_)),
retractall(course_to_print(_,_)),
assert(course(acting,'Theatre Appreciation',ssh211,2)),
assert(course(reading,'Introduction To The Study Of Literature',ssh214,2)),
assert(course(poetry,'Indian Poetry Through the Ages',ssh215,2)),
assert(course(history,'Nation and her Narratives',ssh215,2)),
```

```
assert(course(ai,'Introduction to Intelligent Systems',cse140,1)),
assert(course(ai,'Artificial Intelligence',cse643,6)),
assert(course(ai,'Machine Learning',cse343,3)),
assert(course(ai,'Natural Language Processing',cse556,5)),
assert(course(ai,'Data Mining',cse506,5)),
assert(course(ai,'Statistical Machine Learning',cse342,3)),
```

```
assert(course(qrs,'Quantum Mechanics',ece525,5)),
assert(course(qrs,'Photonics: Fundamentals & Applications',ece545,5)),
assert(course(qrs,'Quantum Materials and Devices',ece524,5)),
assert(course(qrs,'Introduction to Quantum Computing',cse622,6)),
```

```
assert(course(ds,'Fundamentals of Database Management System',cse202,2)),
assert(course(ds,'Big Data Analytics',cse557,5)),
assert(course(ds,'Data Warehouse',cse606,6)),
assert(course(ds,'Database System Implementation',cse507,5)),
```

```
assert(course(uiux,'Prototyping Interactive Systems',des130,1)),
assert(course(uiux,'Design Drawing & Visualization',des101,1)),
assert(course(uiux,'Design of Interactive Systems',des205,2)),
assert(course(uiux,'Visual Design & Communication',des202,2)),
assert(course(uiux,'Design Processes and Perspectives',des201,2)),
assert(course(uiux,'Human Computer Interaction',des204,2)),
assert(course(uiux,'Ergonomics/Human factors for Design',des524,5)),
```

```
assert(course(econ,'Econometrics I',eco221,2)),
assert(course(econ,'Macroeconomics',eco201,2)),
assert(course(econ,'Microeconomics',eco301,3)),
assert(course(econ,'Game Theory',eco311,3)),
assert(course(econ,'Foundations of Finance',eco331,3)),
```

```
assert(course(cse,'Data Structures & Algorithms',cse102,1)),
assert(course(cse,'Advanced Programming',cse201,2)),
assert(course(cse,'Introduction to Programming',cse101,1)),
assert(course(cse,'Algorithm Design and Analysis',cse222,2)),
```

```
assert(course(mth,'Linear Algebra',mth100,1)),
assert(course(mth,'Probability and Statistics',mth201,2)),
assert(course(mth,'Multivariate Calculus',mth203,2)),
assert(course(ece,'Fields and Waves',ece230,2)).
```

define\_prereq:-

```
retractall(pre_req(_,_)),
assert(pre_req(cse643,cse102)),
```

```

assert(pre_req(cse622,mth100)),
assert(pre_req(cse202,cse102)),
assert(pre_req(cse201,cse102)),
assert(pre_req(cse201,cse101)),
assert(pre_req(cse102,cse101)),
assert(pre_req(cse222,cse102)),
assert(pre_req(ece230,mth203)),
assert(pre_req(des202,des101)),
assert(pre_req(des201,des101)),
assert(pre_req(cse343,mth100)),
assert(pre_req(cse343,mth201)),
assert(pre_req(cse343,cse101)),
assert(pre_req(cse343,mth203)),
assert(pre_req(cse556,cse101)),
assert(pre_req(cse556,mth201)),
assert(pre_req(cse556,cse222)),
assert(pre_req(cse556,mth100)),
assert(pre_req(cse506,cse101)),
assert(pre_req(cse506,mth100)),
assert(pre_req(cse506,mth201)),
assert(pre_req(cse342,cse101)),
assert(pre_req(cse342,mth201)),
assert(pre_req(cse557,cse202)),
assert(pre_req(cse606,cse202)),
assert(pre_req(cse507,cse102)),
assert(pre_req(cse507,cse202)),
assert(pre_req(ece525,mth100)),
assert(pre_req(cse622,mth100)),
assert(pre_req(ece545,ece230)),
assert(pre_req(eco221,mth201)).

```

student\_info:-

```

nl,write('Please enter your name: '),nl,
    read(Name),nl,assert(name(Name)),
write('Hi '),write(Name),write('! Welcome, to Electives advisory / prediction system. '),nl,write('Please answer the questions:'),nl.

```

career\_choice:-

```

write('-----'),nl,
write('          Which career you want to pursue? '),nl,
forall(career(X,Y,Z), (write(X),write(' '),write(Z),nl)),
write('Enter option: '),
read(Option),(career(Option,X,Y),assert(career_selected(X))).

```

helper1([Ch|List]):- % get choice for area of interest

```

write('Enter Choice '),
read(Ch),
Ch \= 5->
(ssh(Ch,Type),course(Type,X,Y,Z)->(assert(course_chosen(X,Y)),helper1(List));helper1(List)).
helper1([]).

```

interest\_course:-

```

nl,write('-----'),nl,
write('          Ohter Area of Interest'),nl,
write('1. Acting'),nl,
write('2. Reading'),nl,
write('3. Poetry'),nl,
write('4. History'),nl,

```

```
write('5. No/Done'),nl,  
helper1(List),nl.
```

helper2:-

```
career_selected(ai),retractall(course(qrs,_,_,_)),retractall(course(ds,_,_,_)),retractall(course(uiux,_,_,_)),retractall(course(econ,_,_,_));  
career_selected(qrs),retractall(course(ai,_,_,_)),retractall(course(ds,_,_,_)),retractall(course(uiux,_,_,_)),retractall(course(econ,_,_,_));  
career_selected(ds),retractall(course(qrs,_,_,_)),retractall(course(ai,_,_,_)),retractall(course(uiux,_,_,_)),retractall(course(econ,_,_,_));  
career_selected(uiux),retractall(course(qrs,_,_,_)),retractall(course(ds,_,_,_)),retractall(course(ai,_,_,_)),retractall(course(econ,_,_,_));  
career_selected(econ),retractall(course(qrs,_,_,_)),retractall(course(ds,_,_,_)),retractall(course(uiux,_,_,_)),retractall(course(ai,_,_,_)),  
fail,true.
```

helper3:-

```
course(A,B,C,D),  
retract(course(A,B,C,D)),  
assert(course_to_print(B,C)),  
helper3,  
fail,true.
```

helper4([]). % delete all the course and pre\_req facts for the course that uses has completed

helper4([A|B]):-

```
(retractall(pre_req(_,A));retractall(course(_,_,A,_))),helper4(B).
```

helper5([Ch|List]):-

% get pre\_req course code

```
write('Enter course code (Enter stop. for stopping): '),  
read(Ch),  
dif(Ch,stop),  
course(A,B,Ch,D), retract(course(A,B,Ch,D)),helper5(List).
```

helper5([]).

helper6(X):- % print available course to select pre\_req done

```
course_to_print(A,B),  
retract(course_to_print(A,B)),  
write(X),write(" "),write(B),write(" "),write(A),nl,  
Y is X + 1,  
helper6(Y),fail,true.
```

pre\_req\_done(List):-

```
write('-----'),nl,  
write('Please Select Courses that you have done from given list of Pre-requisites'),nl,  
write('S.no. Course Code Course Name'),nl,  
helper2,  
helper3,  
helper6(1),  
define_course,  
helper5(List),  
helper2,  
helper4(List).
```

helper7:-

```
pre_req(A,B),  
retractall(pre_req(A,B)),retractall(course(C,D,A,F)),helper7,fail,true.
```

helper8:-

```
career_selected(Ch),course(Ch,A,B,C),retractall(course(Ch,A,B,C)),assert(course_chosen(A,B)).
```

helper9(X):-

```
course_chosen(A,B),define_course,course(M,N,B,P),  
retract(course_chosen(A,B)),
```

```
write(P),write("      "),write(B),write("      "),write(A),nl,  
Y is X + 1,  
helper9(Y),fail;true.
```

print\_choice\_availble:-

```
nl,write('-----'),nl,  
write('Here are the recomended list of Electives according to your answers'),nl,  
write('Course Level  Course Code  Course Name'),nl,  
helper7,  
helper8,  
helper9(1),  
fail;true.
```

nan:-

```
career_selected(na),  
write('-----'),nl,  
write('Looks like you haven\'t decided yet'),nl,  
write('No worries! Here are some Introductory courses to Help you. '),nl,  
write('1: Introduction to Intelligent Systems - cse140'),nl,  
write('2: Human Computer Interaction - des204'),nl,  
write('3: Fundamentals of Database Management System - cse202'),nl,  
write('4: Fundamentals of Database Management System - cse202'),nl,  
write('5: Econometrics I -eco221'),nl,  
fail;true.
```

exiting:-

```
nl,write('-----'),nl,  
write('Thanks for using our course prediction system'),nl,  
write('-----'),nl.
```

# Screenshots:

Career AI:

```
SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help
% c:/Users/Mohit Sharma/Documents/Prolog/2020086.pl compiled 0.00 sec, 34 clauses
?- start.

_____Electives advisory / prediction system for BTech or MTech student of IIITD_____

Please enter your name:
|: mohit.

Hi mohit!, Welcome, to Electives advisory / prediction system.
Please answer the questions:

-----
Which career you want to pursue?
1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided
Enter option: |: 1.

-----
Ohter Area of Interest
1. Acting
2. Reading
3. Poetry
4. History
5. No/Done
Enter Choice |: 5.

-----
Please Select Courses that you have done from given list of Pre-requisites
S.no. Course Code Course Name
1 ssh211 Theatre Appreciation
2 ssh214 Introduction To The Study Of Literature
3 ssh215 Indian Poetry Through the Ages
4 ssh215 Nation and her Narratives
5 cse140 Introduction to Intelligent Systems
6 cse643 Aritificial Intelligence
7 cse343 Machine Learning
8 cse556 Natural Language Processing
9 cse506 Data Mining
10 cse342 Statistical Machine Learning
11 cse102 Data Structures & Algorithms
12 cse201 Advanced Programming
13 cse101 Introduction to Programming
14 cse222 Algorithm Design and Analysis
15 mth100 Linear Algebra
16 mth201 Probability and Statistics
17 mth203 Multivariate Calculus
18 ece230 Fields and Waves
Enter course code (Enter stop. for stopping): |: cse101.
Enter course code (Enter stop. for stopping): |: cse201.
Enter course code (Enter stop. for stopping): |: mth100.
Enter course code (Enter stop. for stopping): |: mth201.
Enter course code (Enter stop. for stopping): |: stop.

-----
Here are the recomended list of Electives according to your answers
Course Level Course Code Course Name
1 cse140 Introduction to Intelligent Systems
5 cse506 Data Mining
3 cse342 Statistical Machine Learning

-----
Thanks for using our course prediction system
-----
```

?- start.

Electives advisory / prediction system for BTech or MTech student of IIITD

Please enter your name:

|: mohit.

Hi mohit!, Welcome, to Electives advisory / prediction system.

Please answer the questions:

Which career you want to pursue?

1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided

Enter option: |: 2.

Other Area of Interest

1. Acting
2. Reading
3. Poetry
4. History
5. No/Done

Enter Choice |: 1.

Enter Choice |: 3.

Enter Choice |: 5.

Please Select Courses that you have done from given list of Pre-requisites

S.no.	Course Code	Course Name
1	ssh211	Theatre Appreciation
2	ssh214	Introduction To The Study Of Literature
3	ssh215	Indian Poetry Through the Ages
4	ssh215	Nation and her Narratives
5	ece525	Quantum Mechanics
6	ece545	Photonics: Fundamentals & Applications
7	ece524	Quantum Materials and Devices
8	cse622	Introduction to Quantum Computing
9	cse102	Data Structures & Algorithms
10	cse201	Advanced Programming
11	cse101	Introduction to Programming
12	cse222	Algorithm Design and Analysis
13	mth100	Linear Algebra
14	mth201	Probability and Statistics
15	mth203	Multivariate Calculus
16	ece230	Fields and Waves

Enter course code (Enter stop. for stopping): |: ece230.

Enter course code (Enter stop. for stopping): |: mth100.

Enter course code (Enter stop. for stopping): |: stop.

Here are the recommended list of Electives according to your answers

Course Level	Course Code	Course Name
2	ssh211	Theatre Appreciation
2	ssh215	Indian Poetry Through the Ages
5	ece525	Quantum Mechanics
5	ece545	Photonics: Fundamentals & Applications
5	ece524	Quantum Materials and Devices
6	cse622	Introduction to Quantum Computing

Thanks for using our course prediction system

true .

File Edit Settings Run Debug Help

```
?-
% c:/Users/Mohit Sharma/Documents/Prolog/2020086.pl compiled 0.02 sec, 34 clauses
?- start.
```

\_\_\_\_\_Electives advisory / prediction system for BTech or MTech student of IIITD\_\_\_\_\_

Please enter your name:  
|: mohit.

Hi mohit!, Welcome, to Electives advisory / prediction system.  
Please answer the questions:

-----  
Which career you want to pursue?

1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided

Enter option: |: 4.

-----  
Ohter Area of Interest

1. Acting
2. Reading
3. Poetry
4. History
5. No/Done

Enter Choice |: 4.

Enter Choice |: 5.

-----  
Please Select Courses that you have done from given list of Pre-requisites

S.no.	Course Code	Course Name
1	ssh211	Theatre Appreciation
2	ssh214	Introduction To The Study Of Literature
3	ssh215	Indian Poetry Through the Ages
4	ssh215	Nation and her Narratives
5	des130	Prototyping Interactive Systems
6	des101	Design Drawing & Visualization
7	des205	Design of Interactive Systems
8	des202	Visual Design & Communication
9	des201	Design Processes and Perspectives
10	des204	Human Computer Interaction
11	des524	Ergonomics/Human factors for Design
12	cse102	Data Structures & Algorithms
13	cse201	Advanced Programming
14	cse101	Introduction to Programming
15	cse222	Algorithm Design and Analysis
16	mth100	Linear Algebra
17	mth201	Probability and Statistics
18	mth203	Multivariate Calculus
19	ece230	Fields and Waves

Enter course code (Enter stop. for stopping): |: des201.

Enter course code (Enter stop. for stopping): |: stop.

-----  
Here are the recomended list of Electives according to your answers


Course Level	Course Code	Course Name
2	ssh215	Nation and her Narratives
1	des130	Prototyping Interactive Systems
1	des101	Design Drawing & Visualization
2	des205	Design of Interactive Systems
2	des204	Human Computer Interaction
5	des524	Ergonomics/Human factors for Design

-----  
Thanks for using our course prediction system

-----  
true .



Career AI with no prerequisite done:

 SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

?- start.

\_\_\_\_\_Electives advisory / prediction system for BTech or MTech student of IIITD\_\_\_\_\_

Please enter your name:

|: mohit.

Hi mohit!, Welcome, to Electives advisory / prediction system.

Please answer the questions:

-----  
Which career you want to pursue?

1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided

Enter option: |: 1.

-----  
Other Area of Interest

1. Acting
2. Reading
3. Poetry
4. History
5. No/Done

Enter Choice |: 5.

-----  
Please Select Courses that you have done from given list of Pre-requisites

S.no.	Course Code	Course Name
1	ssh211	Theatre Appreciation
2	ssh214	Introduction To The Study Of Literature
3	ssh215	Indian Poetry Through the Ages
4	ssh215	Nation and her Narratives
5	cse140	Introduction to Intelligent Systems
6	cse643	Artificial Intelligence
7	cse343	Machine Learning
8	cse556	Natural Language Processing
9	cse506	Data Mining
10	cse342	Statistical Machine Learning
11	cse102	Data Structures & Algorithms
12	cse201	Advanced Programming
13	cse101	Introduction to Programming
14	cse222	Algorithm Design and Analysis
15	mth100	Linear Algebra
16	mth201	Probability and Statistics
17	mth203	Multivariate Calculus
18	ece230	Fields and Waves

Enter course code (Enter stop. for stopping): |: stop.


-----  
Here are the recommended list of Electives according to your answers

Course Level	Course Code	Course Name
1	cse140	Introduction to Intelligent Systems

-----  
Thanks for using our course prediction system

-----  
**true** .

Career Economist:

 SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

?- start.

\_\_\_\_\_Electives advisory / prediction system for BTech or MTech student of IIITD\_\_\_\_\_

Please enter your name:

|: mohit.

Hi mohit!, Welcome, to Electives advisory / prediction system.

Please answer the questions:

-----  
Which career you want to pursue?

1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided

Enter option: |: 5.

-----  
Other Area of Interest

1. Acting
2. Reading
3. Poetry
4. History
5. No/Done

Enter Choice |: 1.

Enter Choice |: 4.

Enter Choice |: 5.

-----  
Please Select Courses that you have done from given list of Pre-requisites

S.no.	Course Code	Course Name
1	ssh211	Theatre Appreciation
2	ssh214	Introduction To The Study Of Literature
3	ssh215	Indian Poetry Through the Ages
4	ssh215	Nation and her Narratives
5	eco221	Econometrics I
6	eco201	Macroeconomics
7	eco301	Microeconomics
8	eco311	Game Theory
9	eco331	Foundations of Finance
10	cse102	Data Structures & Algorithms
11	cse201	Advanced Programming
12	cse101	Introduction to Programming
13	cse222	Algorithm Design and Analysis
14	mth100	Linear Algebra
15	mth201	Probability and Statistics
16	mth203	Multivariate Calculus
17	ece230	Fields and Waves

Enter course code (Enter stop. for stopping): |: mth100.

Enter course code (Enter stop. for stopping): |: stop.


-----  
Here are the recommended list of Electives according to your answers

Course Level	Course Code	Course Name
2	ssh211	Theatre Appreciation
2	ssh215	Nation and her Narratives
2	eco201	Macroeconomics
3	eco301	Microeconomics
3	eco311	Game Theory
3	eco331	Foundations of Finance

-----  
Thanks for using our course prediction system

-----  
true .

Career Not decided:

 SWI-Prolog (AMD64, Multi-threaded, version 8.4.3)

File Edit Settings Run Debug Help

Welcome to SWI-Prolog (threaded, 64 bits, version 8.4.3)

SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.

Please run `?- license.` for legal details.

For online help and background, visit <https://www.swi-prolog.org>

For built-in help, use `?- help(Topic).` or `?- apropos(Word).`

`?-`

`% c:/Users/Mohit Sharma/Documents/Prolog/2020086.pl compiled 0.00 sec, 34 clauses`

`?- start.`

\_\_\_\_\_Electives advisory / prediction system for BTech or MTech student of IIITD\_\_\_\_\_

Please enter your name:

`|: mohit.`

Hi mohit!, Welcome, to Electives advisory / prediction system.

Please answer the questions:

-----  
Which career you want to pursue?

1. Artificial Intelligence
2. Quantum Researcher
3. Data Scientist
4. UI/UX designer
5. Economist
6. Not Decided

Enter option: `|: 6.`

-----  
Other Area of Interest

1. Acting
2. Reading
3. Poetry
4. History
5. No/Done

Enter Choice `|: 5.`

-----  
Looks like you haven't decided yet

No worries! Here are some Introductory courses to Help you.

- 1: Introduction to Intelligent Systems - cse140
- 2: Human Computer Interaction - des204
- 3: Fundamentals of Database Management System - cse202
- 4: Fundamentals of Database Management System - cse202
- 5: Econometrics I -eco221

-----  
Thanks for using our course prediction system

**true.**