AI ASSIGNMENT 1

ADVISORY SYSTEM

Functionality:

- The program runs for students of every branch and can suggest electives for all their semesters.
- Till the 4th semester, the offered electives are suggested and the derivation is straightforward.
- 5th sem onwards, the suggestions are made on a priority basis:
    - Their career plan is kept foremost
    - If the necessary courses according to the career choice have been done.
    - Marks obtained in the essential courses.
    - If BTP has been completed.
    - If credits are over the allowed number of credits
    - Finally, electives based on their interests.
- The system takes into account the necessary courses, relevance to career and finally the driving interest towards the courses.
- The freedom of electives has been taken care of. Interbranch electives are suggested as and when found suitable.

1. For the First Semester

Here no elective courses are available to anyone despite the branch. Thus, just a Hello to the user.

```
?- start.


Welcome to the Advisory! Let's discuss your dilemmas :)

Enter your name:
|: ananya.

Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: csd.

Enter your semester(1-8)
|: 1.

Hello ananya, csd branch!
You are in 1st year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.

No electives to choose in 1st sem, see you next time!

Choose again!
1.Restart
2.Terminate.
|: 1.
```

2. For the Second Semester

Cse, Csss, Csai, Csam and Ece, are offered SSH electives based on their interest. Csd is not offered any choice.

```
Choose again!
1.Restart
2.Terminate.
|: 1.


Welcome to the Advisory! Let's discuss your dilemmas :)

Enter your name:
|: ananya.

Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: cse.

Enter your semester(1-8)
|: 2.

Hello ananya, cse branch!
You are in 1st year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.

Which of the following is your area of interest?
1.Indian Social Sciences.
2.Finance
3.Philosophy/Ethics
|: 3.

You have these SSH courses to choose from!

Introduction to Philosophy
Theory and Practice of Engineering Ethics


Choose again!
1.Restart
2.Terminate.
```

3. For the Third Semester

Cse, Csam and Ece, are offered SSH electives.
Cse, Csd and Ece are offered Math choices.
Csb, Csss, Csai are not offered any choice.

```
Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: ece.

Enter your semester(1-8)
|: 3.

Hello ananya, ece branch!
You are in 2nd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.

What are you more interested in?:
1. Social Sciences
2. Programming
|: 2.

You should go with the following course!
Advanced Programming

Choose again!
1.Restart
2.Terminate.
|:
```

4. For the Fourth Semester

Cse and Ece, are offered SSH electives.
Csd has to choose between math and SSH electives.
Csam, Csss and Csb are offered no choice.
Csai has been given a range of options.

I have implemented the prediction system by prompting the user to tell about their interest.
Based on that an electives are suggested.

```
Welcome to the Advisory! Let's discuss your dilemmas :)

Enter your name:
|: ananya.

Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: csai.

Enter your semester(1-8)
|: 4.

Hello ananya, csai branch!
You are in 2nd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.

What are you most likely to practice in future?
1. Artificial Intelligence
2. Algorithm Design
3. Software Development

|: 1.

You should go with the following electives:
Ethics in AI
Maths IV
Statistical Inference
```

```
Welcome to the Advisory! Let's discuss your dilemmas :)

Enter your name:
|: ananya.

Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: csai.

Enter your semester(1-8)
|: 4.

Hello ananya, csai branch!
You are in 2nd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.

What are you most likely to practice in future?
1. Artificial Intelligence
2. Algorithm Design
3. Software Development

|: 2.

You should go with the following electives:
Graph Theory
Introduction to Mathematical Logic
Theory of Computation
```

5. For the Fifth and Seventh Semester (5 & 7 have same electives)

Here the complexity of the program goes on to increase. All the branches are given a wide range of alternatives and options based on:

- their career choice
- grades in previous courses
- btp and credits acquired

1. **Checks if the student has minimum requirements for the career choice.**
    - if not done then it is suggested to complete the basic courses.

```
Welcome to the Advisory! Let's discuss your dilemmas :)

Enter your name:
|: ananya.

Enter your branch(cse/csam/csai/csb/csd/csss/ece):
|: csss.

Enter your semester(1-8)
|: 5.

Hello ananya, csss branch!
You are in 3rd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.


Where do you see yourself in 5 years...
What is your career choice?
1. Data Analysis
2. Artificial Intelligence
3. Software Development
4. Designing
5. Electrical
6. Research

|: 3.


Have you done all of the following courses? (yes/no)

Complex Analysis
Scientific Computing
Real Analysis II
|: no.
Following are the relevant courses!
Complex Analysis
Scientific Computing
Real Analysis II
```

2. Checks if grades are more than 7 in each of them
    - if it is suggested to **repeat the courses** if grades are less than 7

```
Hello ananya, ece branch!
You are in 3rd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.


Where do you see yourself in 5 years...
What is your career choice?
1. Data Analysis
2. Artificial Intelligence
3. Software Development
4. Research

|: 1.


Have you done all of the following courses? (yes/no)

ML
Data Science
Math 3
PnS
|: yes.
It is suggested to repeat courses less than 7 grade. Do you want to consider repeating some?(y/n)
|: y.


Enter grades of each of them:
1. ML:  |: 6.
2. Data Science:  |: 7.
3. Math 3:  |: 8.
4. PnS:  |: 8.


You have a low grade in this course. Try improving the grades in the same!
 - Machine Learning


Choose again!
1.Restart
2.Terminate.
|: ■
```

3. Checks if BTP is completed or not
    - if they don't want to repeat, **BTP** is asked
    - if they have not done BTP, it is suggested to complete it
    - also checks if **Credits** are enough for a BTP

```
Enter your semester(1-8)
|: 5.

Hello ananya, csam branch!
You are in 3rd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.


Where do you see yourself in 5 years...
What is your career choice?
1. Data Analysis
2. Artificial Intelligence
3. Software Development
4. Research

|: 3.


Have you done all of the following courses? (yes/no)

Data Structures and ALgorithms
Algorithm Design and Analysis
DBMS
CN
|: yes.
It is suggested to repeat courses less than 7 grade. Do you want to consider repeating some?(y/n)
|: n.


Have you completed your BTP? (yes/no)
|: no.


How many credits have you already taken? (16/18/20/22/24)|: 18.

Go for a BTP in Software Development!

Choose again!
1.Restart
2.Terminate.
|: 1.
```

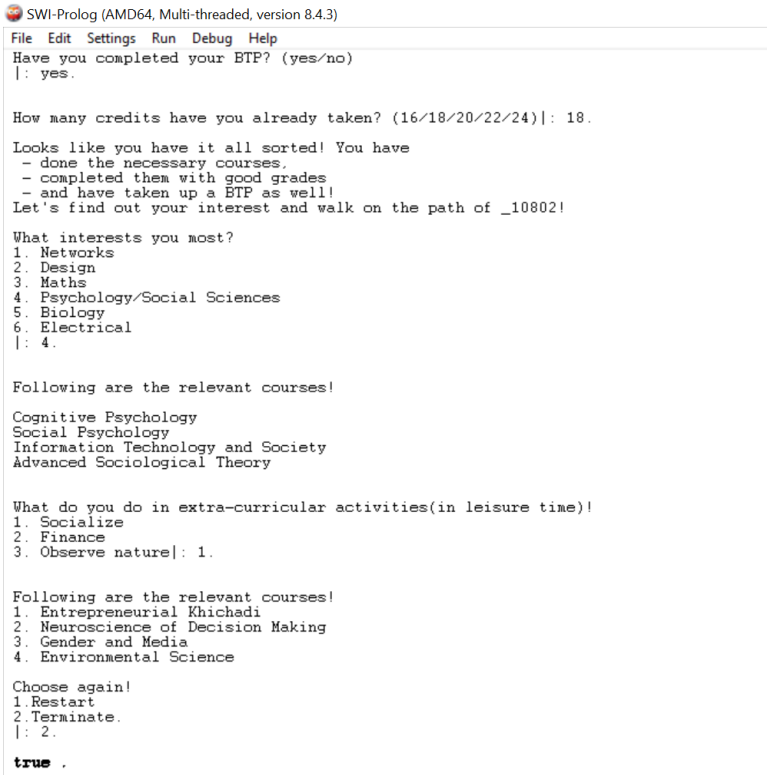
4. **Checks if Credits are not enough for a BTP or a course**
    - if they have Credits>=22, they are not allowed to take up more courses

```
Hello ananya, csd branch!
You are in 3rd year!!

Choose 1-3:
1.Show Electives
2.Restart
3.Terminate.
|: 1.


Where do you see yourself in 5 years...
What is your career choice?
1. Data Analysis
2. Artificial Intelligence
3. Software Development
4. Research

|: 1.


Have you done all of the following courses? (yes/no)

ML
Data Science
Math 3
PnS
|: yes.
It is suggested to repeat courses less than 7 grade. Do you want to consider repeating some?(y/n)
|: n.


Have you completed your BTP? (yes/no)
|: yes.


How many credits have you already taken? (16/18/20/22/24)|: 22.

You can't take another course!

Choose again!
1.Restart
2.Terminate.
|:
```

5. **Asks the student about Interests**
    - if they have done BTP, then <u>Interests</u> are asked

```
File  Edit  Settings  Run  Debug  Help
Where do you see yourself in 5 years...
What is your career choice?
1. Data Analysis
2. Artificial Intelligence
3. Software Development
4. Research

|: 3.


Have you done all of the following courses? (yes/no)

Data Structures and ALgorithms
Algorithm Design and Analysis
DBMS
CN
|: yes.
It is suggested to repeat courses less than 7 grade. Do you want to consider repeating some?(y/n)
|: n.


Have you completed your BTP? (yes/no)
|: yes.


How many credits have you already taken? (16/18/20/22/24)|: 16.

Looks like you have it all sorted! You have
 - done the necessary courses,
 - completed them with good grades
 - and have taken up a BTP as well!
Let's find out your interest and walk on the path of Software Development!

What interests you most?
1. Networks
2. Design
3. Maths
4. Psychology/Social Sciences
5. Biology
6. Electrical
|: 4.


Following are the relevant courses!Cognitive Psychology
Social Psychology
Information Technology and Society
Advanced Sociological Theory
```

6. Finally checks if they have Research and completed BTP, then Extra-curriculars are asked
    - if they are willing to go for Research, further electives are suggested based on Extra-curriculars



6. For the Sixth and Eighth Semester (6 & 8 have same electives)

Here the complexity of the program goes on to increase. All the branches are given a wide range of alternatives and options based on:

- their career choice
- grades in previous courses
- btp and credits acquired

1. **Checks if the student has minimum requirements for the career choice.**
    - if not done then it is suggested to complete the basic courses.

2. **Checks if grades are more than 7 in each of them**
    - if it is suggested to **repeat the courses** if grades are less than 7

3. **Checks if BTP is completed or not**
    - if they don't want to repeat, **BTP** is asked
    - if they have not done BTP, it is suggested to complete it
    - also checks if **Credits** are enough for a BTP

4. **Checks if Credits are not enough for a BTP or a course**
    - if they have Credits>=22, they are not allowed to take up more courses

5. **Asks the student about Interests**
    - if they have done BTP, then **Interests** are asked

6. **Finally checks if they have Research and completed BTP, then Extra-curriculars are asked**
    - if they are willing to go for Research, further electives are suggested based on Extra-curriculars

Functionality is same as the 5th and 7th semesters, just the electives are different according to the semesters, 6 and 8.

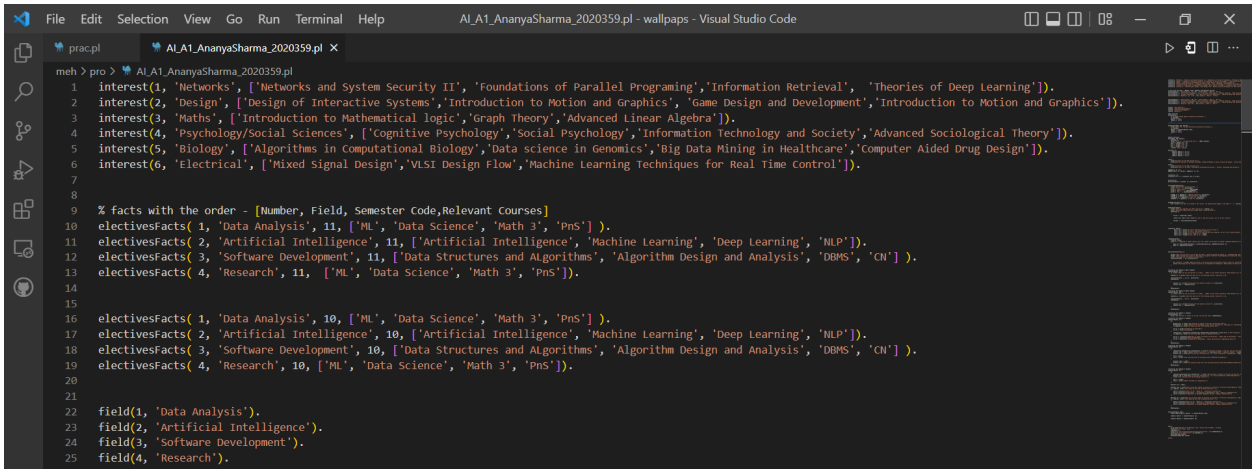
ABOUT THE CODE

Functionality:

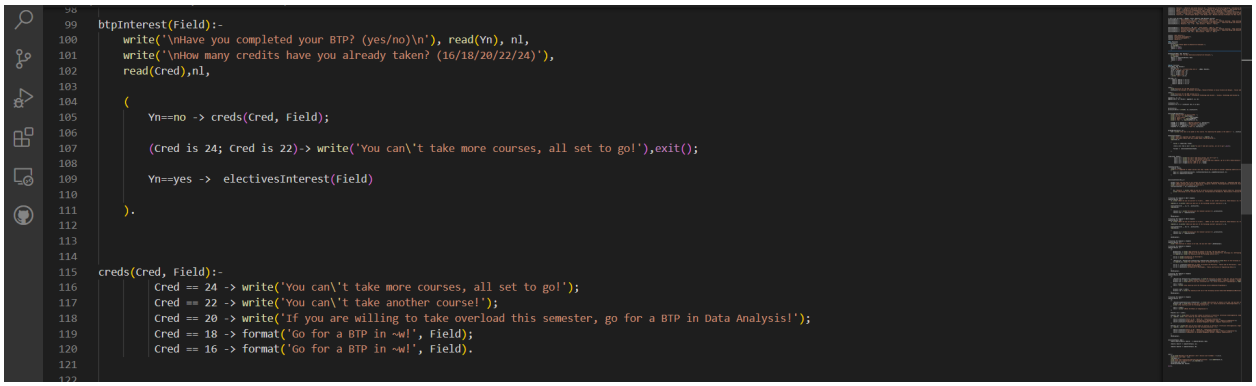
- Lists, Input/ Output, Recursion, Backtracking and Binding have been used.
- Use of Lists
- Recursion and Backtracking in append to list, calculate size, print list

```
appendl([], L2, L2).
appendl([H|T], L2, [H|L3]):- appendl(T, L2, L3).


listSize([], 0).
listSize([_|Y], N ):- listSize(Y, N1), N is N1+1.


printList([]).
printList([H|T]):- write(H), nl, printList(T).
```

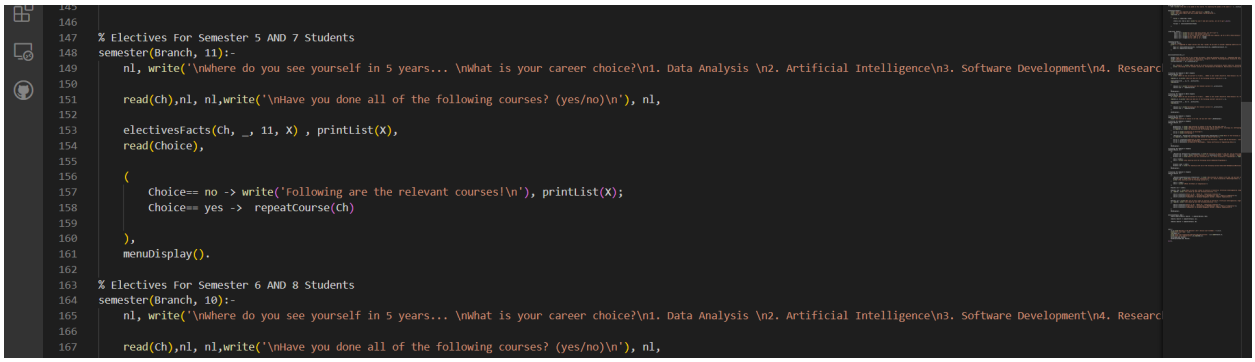
- Binding and facts



- Credits evaluation

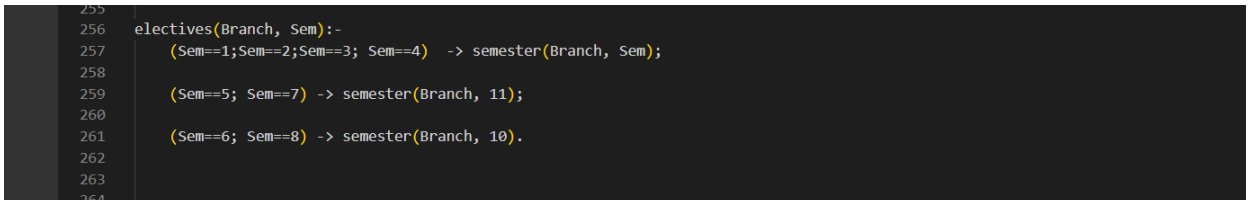


- Semester wise code



```
% Electives For Semester 5 AND 7 Students
semester(Branch, 11):-
    nl, write('\nWhere do you see yourself in 5 years... \nWhat is your career choice?\n1. Data Analysis \n2. Artificial Intelligence\n3. Software Development\n4. Researc

    read(Ch),nl, nl,write('\nHave you done all of the following courses? (yes/no)\n'), nl,

    electivesFacts(Ch, _, 11, X) , printList(X),
    read(Choice),

    (
        Choice== no -> write('Following are the relevant courses!\n'), printList(X);
        Choice== yes ->  repeatCourse(Ch)

    ),
    menuDisplay().

% Electives For Semester 6 AND 8 Students
semester(Branch, 10):-
    nl, write('\nWhere do you see yourself in 5 years... \nWhat is your career choice?\n1. Data Analysis \n2. Artificial Intelligence\n3. Software Development\n4. Researc

    read(Ch),nl, nl,write('\nHave you done all of the following courses? (yes/no)\n'), nl,
```

- Semester Classification



```
electives(Branch, Sem):-
    (Sem==1;Sem==2;Sem==3; Sem==4)  -> semester(Branch, Sem);

    (Sem==5; Sem==7) -> semester(Branch, 11);

    (Sem==6; Sem==8) -> semester(Branch, 10).
```