Book Recommendation System

1. Introduction: In our current world, we have lots of kinds of recommendation system like food, cloth, etc. Every system utilizes the user data and generates proper response. In order to process such huge amount of data we need expert systems which can learn from user behavior. Now-a-days AI is everywhere. So to familiarize ourselves to the state of the art of AI we used logical programming language like prolog to develop our project.

2. Design: The Book Recommendation System is designed into two parts. In one part, the system recommend genres based on the age and mood of the user. Picture is shown below:

```
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).

?- start.
Expert System - Book Recommender
What is your name?
|: shovon.

Hello shovon
Do you like us to recommend genres or recommend book?
write genres/book
|: genres.

What is your age?
|: 24.

What is your mood?
1.sad
2.happy
3.normal
|: sad.

You can read books in the following genres: Romance, Comedy, Thriller
true .

?- ■
```

Figure 1Genre recommendation

If a user is below 18 years the expert system will suggest Child Story to him.

Another part of our system is to recommend books to the user. The system can recommend books using genres or the book's writer. The picture is shown below:

```
?- start.
Expert System - Book Recommender
What is your name?
|: shovon.

Hello shovon
Do you like us to recommend genres or recommend book?
write genres/book
|: book.

What do you like to read?(Foreign/Bengali book)
1.Foreign
2.Bengali
|: Foreign.

Do you have any favourite writer?
1.yes
2.no
|: yes.

yes
Write the name of your writer:(In CamelCase format)
|: 'Lewis Carroll'.

You should read this book written by himAlice's Adventures in Wonderland
true.

?- ▮
```

Figure 2 Book Recommendation using writers name

In this part, the system recommends book based on the language of the book and the writer's name of the book. If the writer's name is not in the knowledge base then the

There is another part in this system. This part recommends book based on the language and genre of the book. Picture is shown below:

```
?- start.
Expert System - Book Recommender
What is your name?
|: shovon.

Hello shovon
Do you like us to recommend genres or recommend book?
write genres/book
|: book.

What do you like to read?(Foreign/Bengali book)
1.Foreign
2.Bengali
|: Bengali.

Do you have any favourite writer?
1.yes
2.no
|: no.

no
Write the name of your favourite genre:
|: ChildStory.

You can read this book The Little Prince by Antoine de Saint-Exupry
true.
```

Figure 3 Book Recommendation using genre.

3. Methodology: The code is divided in to several parts. The first part is the knowledge base. The knowledge base is shown below:

```prolog
%% Knowledge Base
%Story
book('The Little Prince','Antoine de Saint-Exupry',ChildStory,Foreign).
book('Harry Potter and the Sorcerer\'s Stone',ChildStory,Foreign).
book('Alice\'s Adventures in Wonderland','Lewis Carroll',ChildStory,Foreign).
book('The Lion, the Witch and the Wardrobe',' C. S. Lewis',ChildStory,Foreign).
book('The Adventures of Pinocchio','Carlo Collodi',ChildStory,Foreign).

%novels

book('Deyal','Humayun Ahmed', Novel, Bengali).
book('Megheder din','Sadat Hossain',Novel,Bengali).
book('Misir Ali Somogro', 'Humayun Ahmed', 'Thriller',Bengali).
book('Kishore Golpo Somogro', 'Robindra Nath Tagore', ChildStory, Bengali).

book('To Kill a Mockingbird','Harper Lee',Novel,Foreign).
book('Lolita','Vladimir Nabokov',Novel,Foreign).
book('The Lord of the Rings','J.R.R. Tolkien',Novel,Foreign).
book('The Brothers Karamazov','Fyodor Dostoevsky',Novel,Foreign).

book('The Great Gatsby',' F. Scott Fitzgerald','Tragedy',Foreign).

book('Grown Ups','Marian Keyes',Comedy,Foreign).
book('A Very Punchable Face: A Memoir','Colin Jost',Comedy,Foreign).
book('Slouchers: The Novelization','Mike Sacks',Comedy,Foreign).

book('Little Miss Little Compton: A Memoir','Arden Myrin','Biography',Foreign).
```

Another part is rules of the system. The rules of the system is shown below:

```prolog
%%Rules

foreign_book(X,Y) :- book(X,_,_,Y) , Y == Foreign.
bengali_book(X,Y) :- book(X,_,_Y) , Y \== Foreign.

written_by(X,Y) :- book(X,Y,_,_).

genre(X,Y) :- book(X,_,Y,_).

% X = book Y = writer Z = genres K = Language A = age

suggest_book(X,Y,Z,K) :- book(X,Y,_,K).

recommendation(X,Y,O) :- X =< 18 , Y == 'sad' , O = 'ChildStory, Comedy, Biography'.
recommendation(X,Y,O) :- X =< 18 , Y == 'happy' , O = 'ChildStory, Novel, Thriller'.
recommendation(X,Y,O) :- X =< 18 , Y == 'normal' , O = 'ChildStory, Comedy, Novel'.
recommendation(X,Y,O) :- X > 18 , Y == 'sad' , O = 'Romance, Comedy, Thriller'.
recommendation(X,Y,O) :- X > 18 , Y == 'happy' , O = 'Biography,Story,Novel'.
recommendation(X,Y,O) :- X > 18 , Y == 'normal' , O = 'Romance,Tragedy,Travelling'.
```

Expert System is shown below:

```prolog
49
50   %% Expert System
51   start:-
52       write('Expert System - Book Recommender'),nl,
53       write('What is your name?'),nl,
54       read(Name),nl,
55       write('Hello '),
56       write(Name),nl,
57       write('Do you like us to recommend genres or recommend book?'),nl,
58       write('write genres/book'),nl,
59       read(Dec),nl,
60       (Dec == 'genres' -> write('What is your age?'),nl,
61                           read(Age),nl,
62                           write('What is your mood?'),nl,
63                           write('1.sad'),nl,
64                           write('2.happy'),nl,
65                           write('3.normal'),nl,
66                           read(Mood),nl,
67                           recommendation(Age,Mood,Genre),
68                           write('You can read books in the following genres: '),
69                           write(Genre)
70
71                           ;
72                           write('What do you like to read?(Foreign/Bengali book)'),nl,
73                           write('1.Foreign'),nl,
74                           write('2.Bengali'),nl,
75                           read(Language),nl,
76                           write('Do you have any favourite writer?'),nl,
77                           write('1.yes'),nl,
78                           write('2.no'),nl,
79                           read(Favourite),nl,
```
Line 51, Column 1

```prolog
74                   write('2.Bengali'),nl,
75                   read(Language),nl,
76                   write('Do you have any favourite writer?'),nl,
77                   write('1.yes'),nl,
78                   write('2.no'),nl,
79                   read(Favourite),nl,
80                   write(Favourite),nl,
81                   (Favourite == 'yes' -> write('Write the name of your writer:(In CamelCase format)'),nl,
82                                          read(Writer),nl,
83                                          (written_by(X,Writer) -> suggest_book(X,Writer,_,Language),
84                                              write('You should read this book written by him'),
85                                              write(X)
86                                          ; write('Writer is not present in our knowledge base.'))
87
88                                          ; write('Write the name of your favourite genre:'),nl,
89                                          read(Genre),nl,
90                                          (genre(X,Genre) -> suggest_book(X,Y,Genre,Language),
91                                                          write('You can read this book '),
92                                                          write(X),write(' '),
93                                                          write('by'),write(' '),
94                                                          write(Y)
95                                                          ; write('This genre is not in our KB')
96                                          )
97                   )
98       ).
99
100
```

4. Conclusion: The objective of this project is to build an expert system that can recommend books depending on small number of factors. In future, we may build a robust system depending on a large number of factors.