

# DTI5125[EG] Data Science Applications

## Chatbot Development Assignment: Book Recommendation System ChatBot (ktaby)

Kareem Atif Mohamed Bakli<sup>1</sup>, Mostafa Mahmoud Nofal<sup>2</sup>, Gehad Hisham Hassanr<sup>3</sup>, and Kareem Khaled Moner Waly<sup>4</sup>

<sup>1</sup>kbakl031@uOttawa.ca

<sup>2</sup>mnofa091@uottawa.ca

<sup>3</sup>gsoma101@uOttawa.ca

<sup>4</sup>kwaly008@uOttawa.ca



### 1-DATA SCIENCE SUBJECT:

We choose a book recommendation system Chatbot is an intelligent assistant recommendation system where we have to recommend similar or new books to the reader based on his interest.

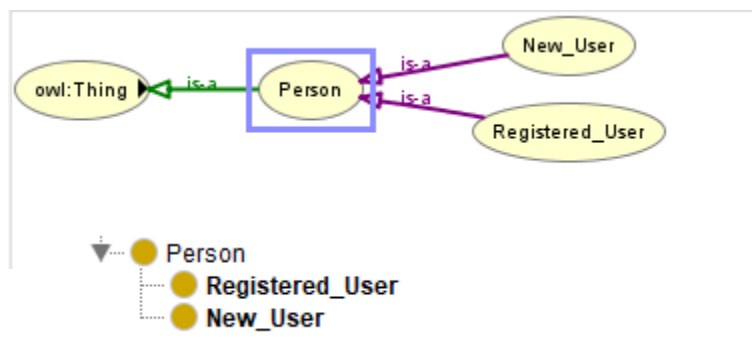
### 2-CREATE THE ONTOLOGY :

First we determine our ontology classes:

- **Person Class** which include two sub classes:

1-New user

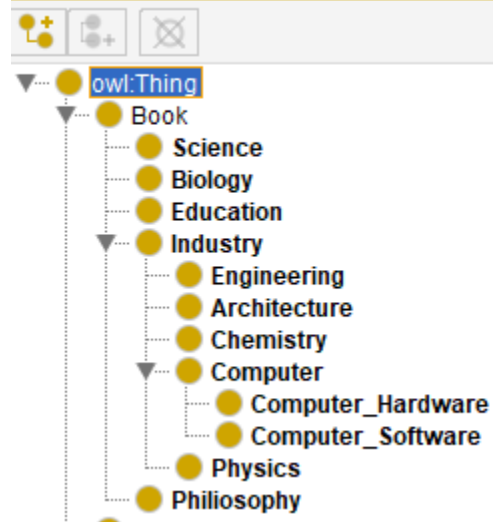
2-Registered user.



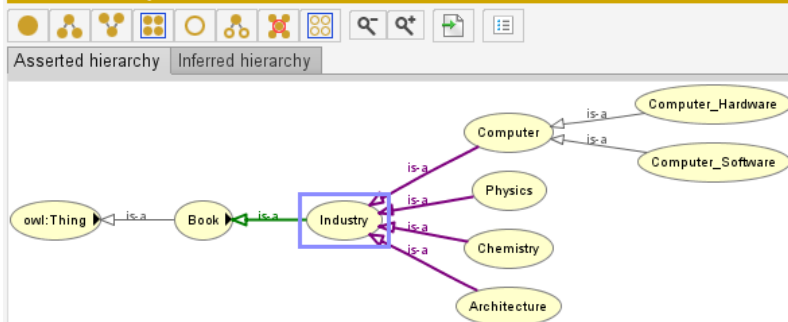
- **Book Class** which include Five sub classes:

- 1-Biology
- 2-Education
- 3-Science
- 4-Philosophy
- 5-Industry

#### Class hierarchy: owl:Thing



#### OWLviz: Industry



**Then,**

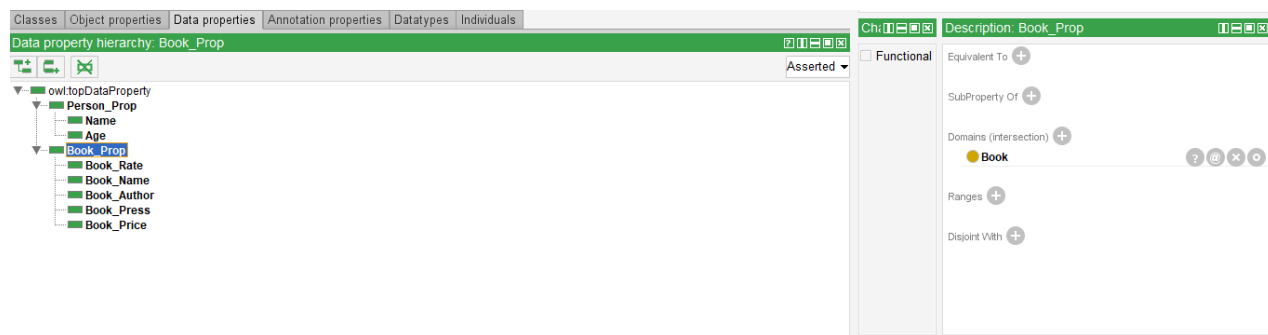
**Sub Class** Industry have 5 sub classes:

- 1-Engineering
- 2-Physics
- 3-Computer Hardware Software
- 4-Architecture
- 5-Chemistry

## **Data Properties:**

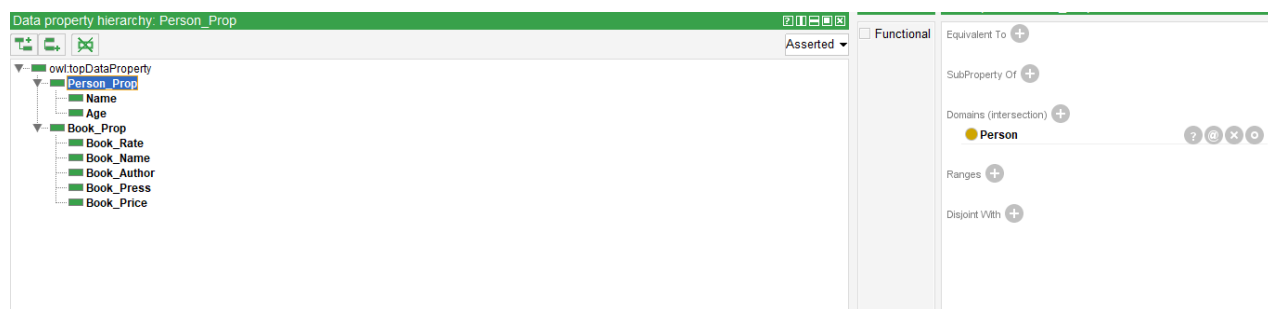
**-Each sub class of Book have following attributes:**

- 1-Book Author
- 2-Book Price
- 3-Book Nam
- 4-Book Press
- 5-Book Rate

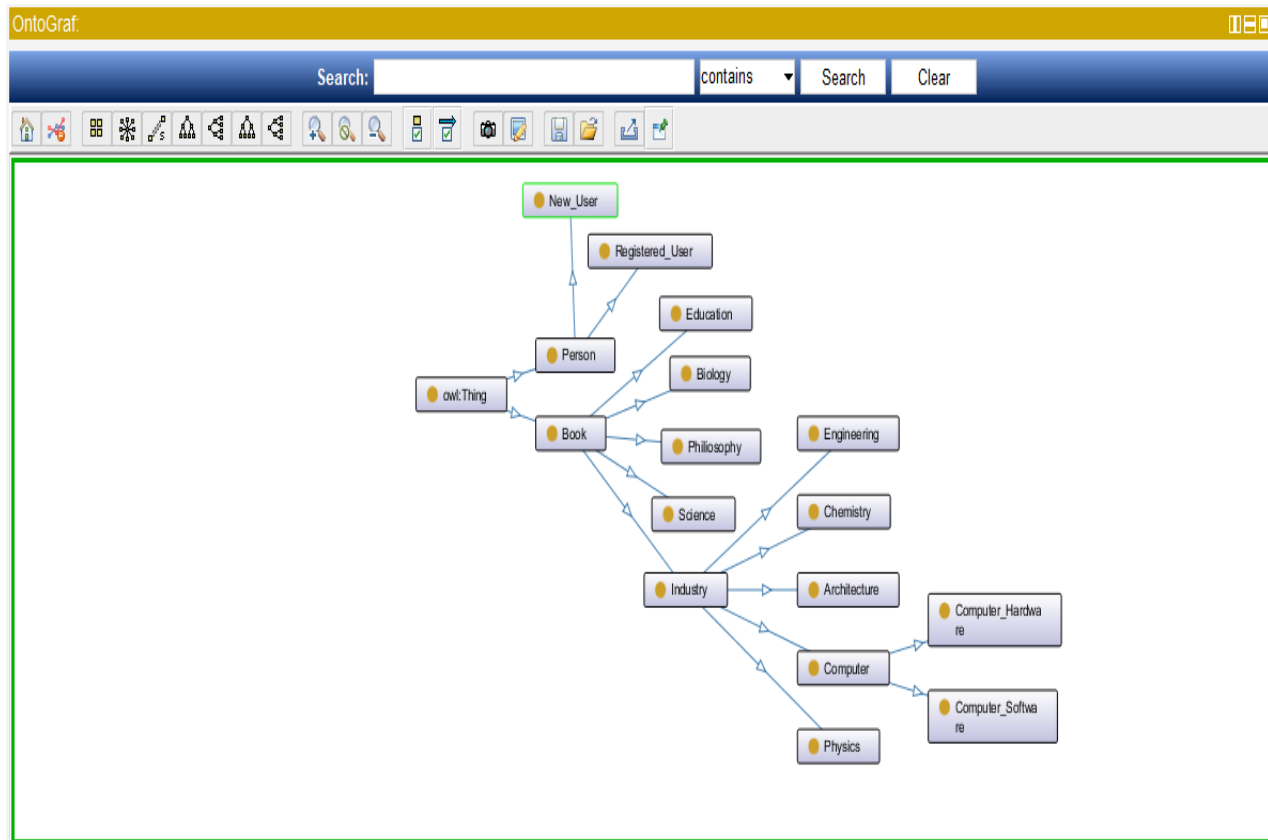


**-Each sub class of Person have attributes**

- 1-Person Age
- 2-Name
- 3-Interest



## ● Knowledge Structure



### 3-COMPETENCY QUESTIONS:

- Can you suggest to me a good Industry book ?
- I would like to read education book.
- I am a casual reader and love to read sci-fi and fantasy books.
- The last book I read was Harry Potter.
- I do not have an information right now for this request.
- I want to search for a book.

## 4-TRAINING QUESTION-ANSWERS:

### Intents

The screenshot shows the Dialogflow Intents page. On the left is a sidebar with navigation options: Ktaby, en, Intents (selected), Entities, Knowledge [beta], Fulfillment, Integrations, Training, Validation, History, and Analytics. The main area is titled 'Intents' and has a 'CREATE INTENT' button. Below the title is a search bar labeled 'Search intents'. A list of intents is displayed, including '1. Default Welcome Intent', '2. Search-for-books', '3. Books-genre', '4. Books examples', '5. Biology Books', '5.1. Industry books', '5.2. Education Books', '5.3. Philosophy Books', '5.4. Science books', '6. Do not know', '7. Goodbye', and 'Default Fallback Intent'.

First is have the welcome intent. Intent to search for the books. and ask the user about his favorite genre. Then the intents which include the variety of specializations

### Entities

The screenshot shows the Dialogflow Entities page. The sidebar is identical to the Intents page, with 'Entities' selected. The main area is titled 'Entities' and has a 'CREATE ENTITY' button. Below the title are tabs for 'Custom' and 'System'. A search bar labeled 'Search entities' is present. A list of entities is displayed, including '@ Biology', '@ books-genre', '@ Education', '@ Industry', '@ Philosophy', and '@ Science'.

We made 2 of them. One is book genre which is general form of searching for the genre and we have also specific entities for specific keywords in the genre. Now we will take a closer look at the training and responses of the intents



## 1.Default Welcome Intent

For the default welcome intent, we have the basic sentences to open the dialogue and the chatbot will respond with the name and small description about it.

### Training phrases

” hi
” hello
” hey
” lovely day isn't it
” I greet you
” a good day

### Responses

Text Response 	
1	Hello! I am Ktaby Recomendation book Chatbot Developed by amazing DEBI team : ) .
2	Greetings! I am Ktaby Recomendation book Chatbot Developed by amazing DEBI team : ) .
3	Good day! I am your Recomendation book Chatbot.
4	Enter a text response variant 

### Test Cases:

- heya
- howdy
- hi there
- greetings
- hello again



## 2.Search-for-books

Now we have the step to search for the books. The user can ask questions whether its suggesting, recommending or searching for books. In our scenario we made the chatbot ask the user about his favorite genre.

## Training phrases

”	Suggest me book to read
”	Can you recommend me a book?
”	I want to search for a book.
”	I want to read a book

## Responses

Text Response		
1	Of course, which genre do you like to read?	
2	Yes of course, tell me about the genre you like the best.	
3	What genre do you prefer to read?	
4	Enter a text response variant	

## Test Cases

- Book recommendation
- Recommend me a good book
- Let's buy a book
- I hope to read a book
- I would like to read a book



## 3.Books-genres

So next is books-genres intent. It includes the books-genre entity which decided the field of the book the user interested in. Here the chatbot will respond with some good responses include the same field that he chose and then ask him for the name of the last book he read.

## Training phrases

”	I prefer <b>historical</b> books
”	I want stories for <b>children</b>
”	I love <b>romance</b> books.
”	I am a casual reader and love to read <b>sci-fi</b> and <b>fantasy</b> books.

## Responses

Text Response		
1	It's great to hear that you like \$books-genre books. what is the last book you read?	
2	I also like \$books-genre books, we have common taste. what is the last book you read?	
3	Great!! I am wondering what is the last book you read?	
4	Cool!! Tell me more about the last book you read.	
5	Enter a text response variant	

## Test Cases




- I want something for my children
- I like to read action books
- Fiction
- horror

Now we have 2 options whether the user knows the name of the book or he doesn't know



### 4.First scenario: The user knows the last book.

For the first scenario he will recommend him books related to the book he chose.

## Training phrases

 I love The Fellowship of the Ring.
 I read lord of the rings.
 The last book I read was Harry Potter.

## Responses

Text Response		
1	So you will like Pennyroyal Academy Series. by M.A. Larson	
2	Ok then of course you will like the Hobbit.	
3	So I recommend you to read The Return of the King.	
4	Enter a text response variant	

## Test Cases

- The last book I read was Rebecca.
- The last book was Rebecca
- I read The Frankenstein
- I love The Westing Game



## 5.Second scenario: The user doesn't Know

The second scenario is that he doesn't know or he don't remember so we will recommend him books directly

### Training phrases

- ” I am not sure about that
- ” I do not have that information right now
- ” I do not remember
- ” I really do not know, can you help me?

### Responses

#### Text Response



- 1 So let me recommend you one of our top rated books which name is The Lord of the Rings .
- 2 Ok no problem. I will recommend you one that has also a trailer you can watch in the weekend which name is Harry Potter.
- 3 Enter a text response variant

### Test Cases

- I am not 100% sure
- I forgot
- I have no idea
- I haven't a clue
- I haven't got the faintest idea

## 6.Intent for a specific genre

Now these are the intents that we discussed before. It's for every specific genre individually. We made 4 genres: industry, education, philosophy and science. We did the same steps for every genre and everyone has its own entity

### 6.1. Training phrases for industry

- ” can you suggest to me an industry book.
- ” I would like to read industry books
- ” I prefer industry books

## Responses

### Text Response



- 1 The \$100 Startup by Chris Guillebeau is a good \$Industry book.
- 2 Suggest to read Structures – or Why Things Don't Fall Down by J.E. Gordon is a good Engineering \$Industry book.
- 3 A Brief History of Time is a good choice for physics \$Industry book.
- 4 Enter a text response variant



## 6.2. Training phrases for education

- ” I prefer Education
- ” I would like to read education book.
- ” Can you suggest for me an education book?

## Responses

### Text Response



- 1 Invaluable  
Master the 10 Skills You Need to Skyrocket Your Career, is a good \$education book choice .
- 2 Thrive Through the Five  
Practical Truths to Powerfully Lead through Challenging Times is a good \$education book.
- 3 I suggest you to read Design Thinking for School Leaders  
Five Roles and Mindsets That Ignite Positive Change as you interested in \$education books.
- 4 Enter a text response variant



## 6.3. Training phrases for philosophy

- ” I would prefer to read Philosphy books.
- ” I would like to read Philosphy books
- ” Can you suggest for me a Philosphy book?

## Responses

Text Response



- 1 suggest to read The Prince By Niccolò Machiavelli , you will like it.
- 2 Great Philosophers Volume One is a good choice for \$Philiosphy book.
- 3 Principles of Cartesian Philosophy is the best \$Philiosphy book I suggest , wish you will enjoy reading it.
- 4 Enter a text response variant

## 6.4. Training phrases for science

” can you suggest to me science book ?

” I like to read science book.

” I would prefer to read Science books

## Responses

Text Response



- 1 Sapiens: A Brief History of Humankind is a good \$science book.
- 2 The Gene: An Intimate History is a good choice for \$science books.
- 3 Suggest to read ON THE ORIGIN OF SPECIES , you will like it : ).
- 4 Enter a text response variant

## Test cases for genres:

- I want something for my fictional interests
- I like to read action books
- Detective books
- Mathematics books

## 7. Goodbye Intent

Finally, the intent for goodbye and thanks

### Training phrases

” See you later

” Goodbye

” Bye

” Thanks a lot

### Responses

Text Response



- 1 have a nice day
- 2 It was nice to talk to you
- 3 Come again
- 4 Peace out
- 5 Enter a text response variant



### Test Cases

- see you soon
- have a nice day
- good night
- farewell

## 6-EVALUATE TO ISOLATE WEAKNESSES:

We tried the chatbot with our test cases. Most of them were correctly identified because they have relative words with the trainings intents but some of them were hard to identify and the chatbot returned to the default fallback intent.

The screenshot shows the Ktaby chatbot interface. The header includes the Ktaby logo and the text "POWERED BY Dialogflow". The chat history shows the following messages:

- User: Hi
- Bot: Greetings! I am Ktaby Recomendation book Chatbot Developed by amazing DEBI team : ) .
- User: Can you recommend me a book?
- Bot: Of course, which genre do you like to read?

The input field at the bottom contains the text "Ask something..." and a microphone icon.

The screenshot shows the Ktaby chatbot interface. The header includes the Ktaby logo and the text "POWERED BY Dialogflow". The chat history shows the following messages:

- User: read?
- User: let's buy a book
- Bot: Of course, which genre do you like to read?
- User: I would like to read a book
- Bot: Of course, which genre do you like to read?

The input field at the bottom contains the text "Ask something..." and a microphone icon.

The screenshot shows the Ktaby chatbot interface. The header includes the Ktaby logo and the text "POWERED BY Dialogflow". The chat history shows the following messages:

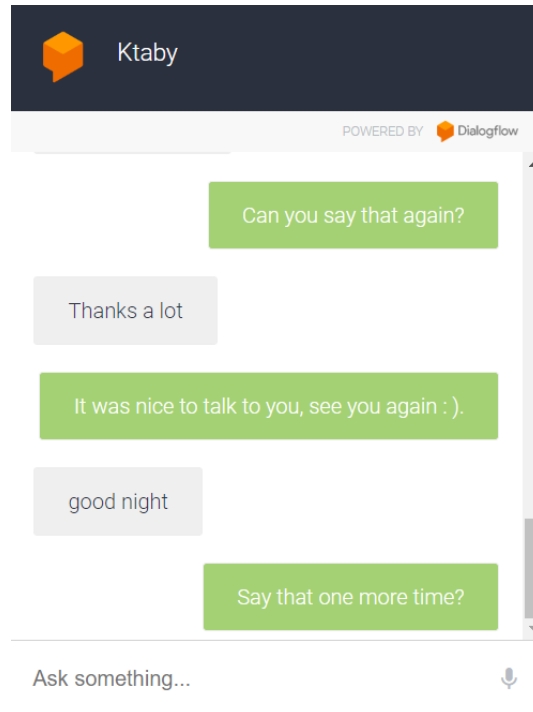
- User: I love romance books
- Bot: I also like romance books, we have common taste. what is the last book you read?
- User: I like to read action books
- Bot: Yes of course, tell me about the genre you like the best.

The input field at the bottom contains the text "Ask something..." and a microphone icon.

The screenshot shows the Ktaby chatbot interface. The header includes the Ktaby logo and the text "POWERED BY Dialogflow". The chat history shows the following messages:

- User: like the best.
- User: I am not sure about that
- Bot: So let me recommend you one of our top rated books which name is The Lord of the Rings .
- User: I have no idea
- Bot: Can you say that again?

The input field at the bottom contains the text "Ask something..." and a microphone icon.



Here are some of the weaknesses:

- **The intents are limited. We included just 4 genres so if the user entered different genre, it will not be identified.**
- **Some intents may contain similar keywords with each other's, so this confuses the chatbot and give us the wrong response.**
- **When we tried to input words but in different languages, it didn't catch it.**

## **7-Chatbot link**

<https://bot.dialogflow.com/8b25ae0d-f2ff-4248-a3fe-0fab03545c62>