CSCI 722 : Data Analytics with Cognitive Computing

Mood-Based Activity Recommendation System

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AIM

The aim of this project is to build a chatbot that can detect a user's tone or mood and recommend activities to either improve his mood (if user is in a negative mood) or to enhance the mood (if user is in a positive mood).

INTRODUCTION

- Used IBM Watson’s Tone Analyzer and Conservation service.
- Conversation Service was used to build a chatbot to interact with the users.
- Tone Analyzer was used to detect moods such as anger, disgust, fear, joy and sadness of the users through the conversations.
- Depending upon the mood detected, activities such as Jokes, Movies, Books, Online Shopping websites were recommended to the users to improve/enhance their mood.

DATA DESCRIPTION

- Used Jokes, Movies and books dataset to recommend activities to the users.
  - Jokes Dataset: Joke ID and Joke
  - MovieLens Dataset: Movie Name and Movie Genre
  - Books DataSet: Book ID, Book Title, Book Author and Book Genre
- Also, used a list of online shopping websites for recommending to the user.

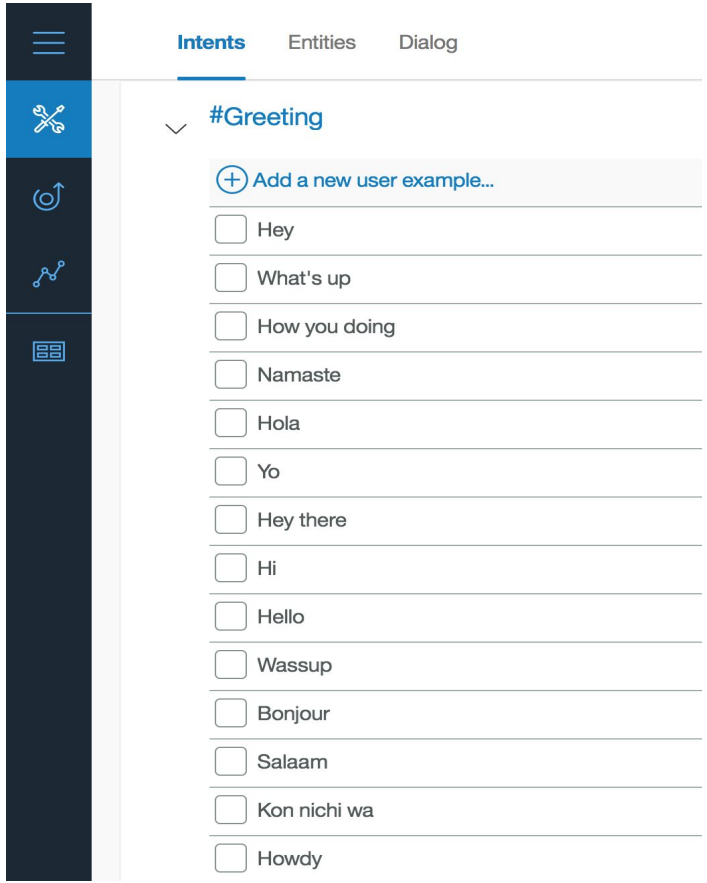
IMPLEMENTATION

Implementation consists of 3 main parts:

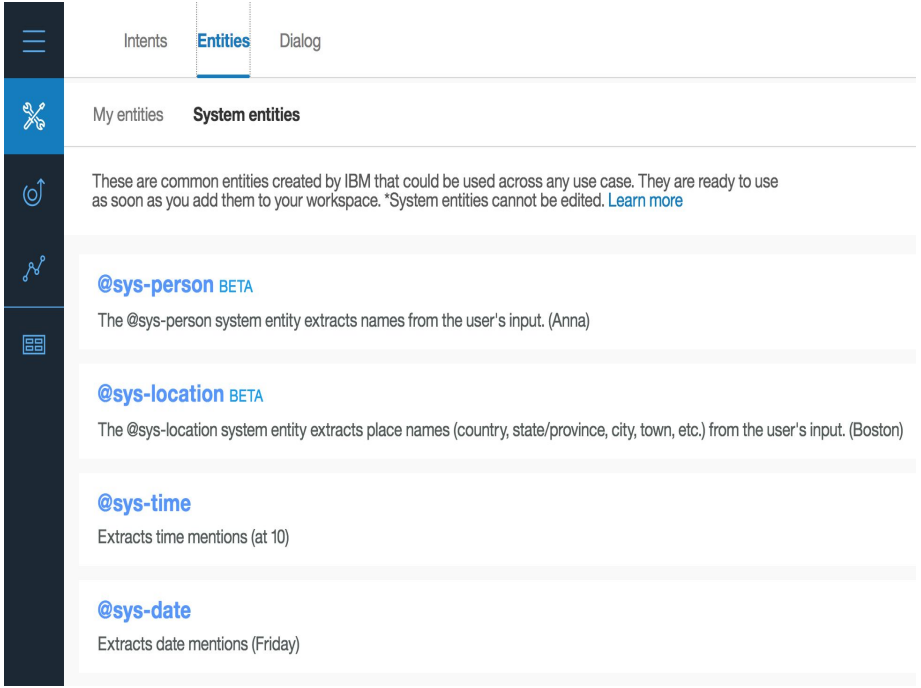
1) Training the Conversation and defining Intents, Entities and Dialog.
2) Using Watson Developer Cloud and Python API.
3) Activity Recommendation.

Training the Conversation

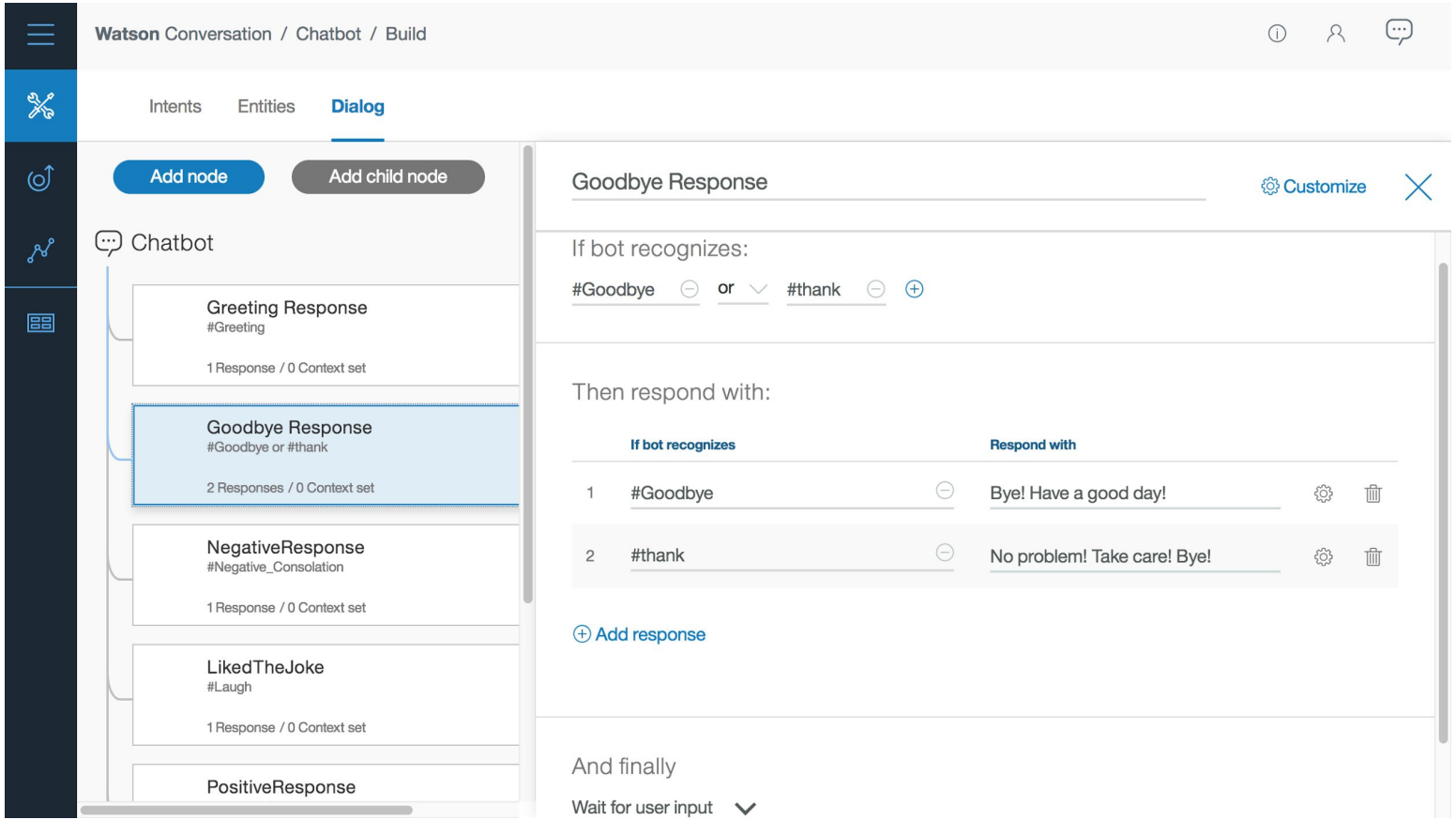
- Intents are used to identify the user input and it's purpose in the conversation flow.
- Must be defined for each input scenario.
- Multiple synonyms are provided for each intent so that Watson can train more efficiently.

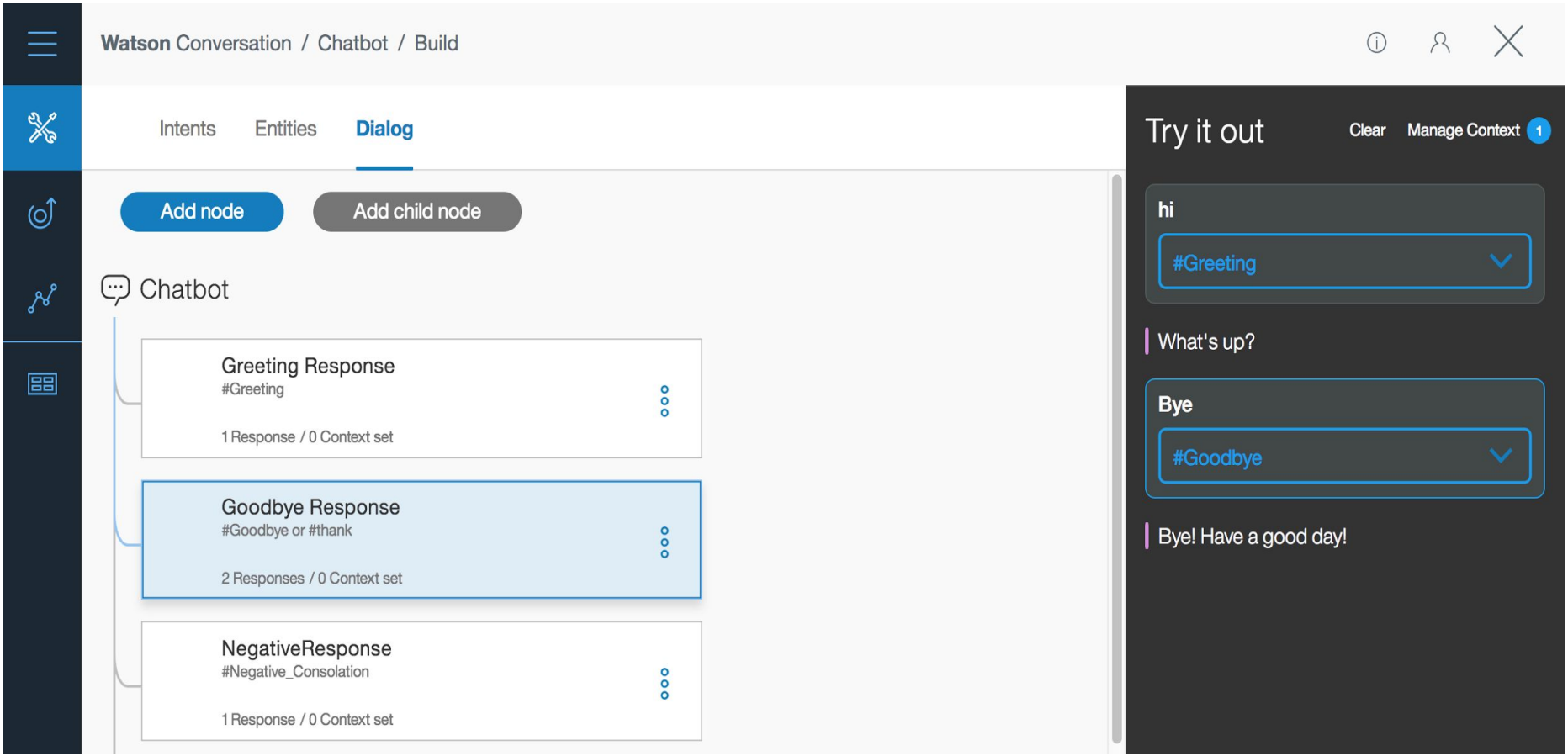


- Entities are objects that are relevant to the user's input and purpose.
- Can be defined explicitly or system entities can also be used.



Dialog uses intents and entities to create the conversation flow.




Watson Conversation / Chatbot / Build
Intents
Entities
Dialog
Add node
Add child node
Chatbot
Greeting Response
#Greeting
1 Response / 0 Context set
Goodbye Response
#Goodbye or #thank
2 Responses / 0 Context set
NegativeResponse
#Negative_Consolation
1 Response / 0 Context set
Try it out
Clear
Manage Context
1
hi
#Greeting
What's up?
Bye
#Goodbye
Bye! Have a good day!

Watson Developer Cloud and Python API

- To be able to use Watson locally, install Watson Developer Cloud on local machine.
- Python provides an API, with the help of which we can create instances of Conversation and Tone Analyzer and link them together.
- Two main methods used:
  - watson_developer_cloud.ConversationV1.message()
  - watson_developer_cloud.ToneAnalyzerV3.tone()

Activity Recommendation

- Activity Recommendation is done using the Python API.
- Messages are fetched using ConversationV1.message() and passed to ToneAnalyzerV3.tone().
- Based on the tone detected, corresponding books and movies are suggested.
- For example, if the tone detected is fear, movies and books belonging to genres like horror or thriller will not be recommended.

LIMITATIONS

- Watson Conversation fails to accept negation in sentences. For example, sentences like “I am not feeling well” are not recognised.
- Conversation also needs perfect grammar.
- Words can exist in one intent only.

ETHICAL CONSIDERATIONS

- Usually emotions guide our emotions and interacting with such systems means giving them access to our thoughts and feelings.
- Recommender systems based on emotions can be manipulated by tailoring the recommendations as per the developer's wish.
- Users having the same emotion regarding a topic can be identified on social media and they can be targeted with more articles related to the same topic. Can be used to incite users against certain individual or organisation. Example : Facebook makes it easier for groups to target certain users with ads.
- Can be used in a good way by identifying users suffering from mental disorders and recommend activities that will ease their pain.

FUTURE SCOPE

- This application can be used as a boilerplate for several other applications such as customer satisfaction.
- The dialog flow can be improved using Watson Conservation Service.
- Books or movies could be recommended as per users choice of interest.
- Other recommendation such as different foods, music or physical activities can be suggested to enhance the mood.

DEMO