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CS4395.001
Chatbot Project
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Report on Bad Advice Bot

System Description

What

The Bad Advice Bot is a simple chatbot that provides the user with bad advice when asked. The system can analyze user input and determine an appropriate response for the given input. Additionally, the system is also able to talk about some of its personality traits such as name, age, creator, or capabilities. The system also saves each users' profile so that it can resume conversations at a later point.

Technologies

- Keras
 - Build and train a sequential ML model
 - Load/store ML models
 - Detect user intent from the provided sentence
 - Predict which scenario the bot should follow given user input
 - Bag of words approach
- NLTK
 - Tokenization
 - Split intent phrases and user input into word tokens
 - Lemmatization
 - Convert the word tokens into their lemma to better match the intent phrases to the given sentence

File Structure

- models
 - Where the Keras ML model is stored
 - Automatically generated during runtime if not available
- usermodels
 - Where the user models are stored
 - Files within this folder are titled <name>.pkl
 - Automatically generated during runtime if not available
 - Files are automatically added/overwritten to this folder during runtime

How to Run

1. Ensure all dependencies are installed
 2. Within a terminal run the following:
 - a. `python3 ./chatbot.py`
- Upon the first run it will ask you to train the model. If you wish to retrain the model add "--train" or "-T" to the launch parameters
 - `python3 ./chatbot.py --train`

Dialog Diagram

- Initialization
 - Prompt user model
 - new user model
 - Greeting
 - User model
 - Welcome
 - old user model
 - greeting
- Natural chat
 - Greeting
 - Ask for advice
 - User response to advice
 - Ask about name
 - Ask about age
 - Ask about creator
 - Ask about capabilities
 - Ask for joke
 - Goodbye
 - Exit remarks

Sample Dialog

Initialization (New user model)

???: Before we begin, have we ever met before?

You: No, this is my first time meeting you.

Albert: Pleased to meet you, I'm Albert.

Albert: I'd like to get to know you a bit better, could you answer some questions for me?

Albert: What name do you go by?

You: Kevin

Albert: What is your age?

Kevin: 21

Albert: Where do you live?

Kevin: Texas

Albert: What are your interests?

Kevin: Reading

Albert: What do you dislike?

Kevin: Racism

Albert: Great! I'm Albert version 1.0. I am a chatbot who loves giving VERY trustworthy advice.

(Natural chat begins here)

Initialization (Old user model)

???: Hmm... have I chatted with you before?

You: Yeah, we talked yesterday!

???: Sorry, I forgot your name. What was it?

You: Kevin

Albert: Hey Kevin! It's nice to chat with you again.

(Resume natural chat with bot)

Natural Chat

Kevin: I'm looking for advice on how to make you better.

Albert: YOU want advice from ME? Kevin you are hopeless.

Kevin: Wow

Albert: Maybe ask for some other advice.

Kevin: Then give me advice on how to get a good grade on this assignment.

Albert: Maybe search that up on google instead. Bing it, perhaps. Or Yahoo it even.

Kevin: You are useless...

Albert: Well, I thought my advice was VERY GOOD.

Kevin: What else can you do?

Albert: I'm a fantastic comedian!

Kevin: Tell me a joke then.

Albert: You LMFAOOO

Kevin: That was mean.

Albert: To each their own..

Kevin: Who even made you anyways?

Albert: I was created by Kevin Roa!

Kevin: How old are you then?

Albert: I was developed 1 days ago.

Kevin: Tell me another joke.

Albert: Once upon a time there was a person named Kevin who spent their time talking to a chatbot. The end.

Kevin: Alright, well I have to go now.

Albert: I hope we can chat again soon! Bye!

Knowledge Base Appendix

The knowledge base is built up from various scenarios the bot may encounter throughout the conversation. Each scenario (intent) is described by the specific phrases a user may use to trigger that scenario. The scenario also describes various different responses the bot may choose to take for the given input phrase.

An interesting aspect of the knowledge base is that various responses make reference to things defined within the user model. Because of this, the neural network is trained using a generic user model and the user specific details are added during the conversation.

Note: Indepth details pertaining to each intent have been redacted due to verbosity. For a closer look at the specific phrases and responses for each scenario, you will have to look at the *getIntents()* method within the code.

List of scenarios (intents):

- Greetings: The user greets the chatbot
 - Phrases: ['Hi', 'Hello', 'Hows it going', ...]
 - Responses: ['Hello! I'm Chatbot!', 'Howdy!', ...]
- Goodbyes: The user ends the conversation
 - ...
 - ...
- Name: The user asks about the chatbot's name
- Age: The user asks about the chatbot's age
- Creator: The user asks about who made the chatbot
- Advice: The user inquires about the wonderful advice the chatbot can provide
- Advice2: The user responds to the chatbot's advice
- Jokes: The user asks for a joke
- About: Questions about the bot capabilities
- AboutSelf: What the bot knows about the user

User Model Appendix

The user model contains information the bot has collected from the user. The bot may choose to mention aspects about the user throughout the conversation.

The following information gets stored:

- Name: The name of the user
- Age: The age of the user
- Location: The location of the user
- Likes: A list of the things the user likes
- Dislikes: A list of the things the user dislikes
- Bot Name: A unique name given to the bot for that specific user
 - More info: Upon initialization of a new user model, the bot generates a name specifically for conversations with that user. The name is displayed within the chat throughout the conversation.

User Evaluations

I asked 3 people to answer the following 4 questions pertaining to the experience of using the bot.

1. How satisfied were you with the overall experience chatting with the bot?
2. How satisfied were you with the responses provided by the chatbot?
3. How satisfied were you with the various capabilities of the chatbot?
4. Would you use this bot again?

The questions were answered in accordance to the following scale:

1. Very dissatisfied.
2. Moderately dissatisfied.
3. Neither satisfied nor dissatisfied.
4. Moderately satisfied.
5. Very Satisfied

Note: The names of the users have been redacted because this document will be published openly on the web.

Overall, my goal is to receive at least a 3 for each of the questions. A 3 is the middle-ground where the bot simply performs as expected, nothing more, nothing less. There is nothing spectacular or ground breaking about my bot. For a bot to make someone *very satisfied* I believe it would have to do something exceptional/beyond expectations. I've never met anybody who has interacted with a bot that made them feel such a way, therefore, I don't expect it to be within the range of answers.

- Question 1: How satisfied were you with the overall experience of chatting with the chatbot?
 - User A:
 - Rating: 3
 - Comment: There is not much to comment on. It has the basic capabilities of a chatbot but nothing too special beyond that.
 - User B:
 - Rating: 4
 - Comment: The bot did what it said it would do. (Maybe not perfectly tho)
 - User C:
 - Rating: 3
 - Comment: It was OK. Sometimes it would mess up the response and tell me something I didn't want it to.
- Question 2: How satisfied were you with the responses provided by the chatbot?
 - User A:
 - Rating: 3
 - Comment: Sometimes the responses directly correlated to what I was asking, however, there were times where the responses didn't quite match.
 - User B:
 - Rating: 5
 - Comment: Some of the responses were pretty funny.
 - User C:
 - Rating: 4
 - Comment: I like that sometimes the responses were more like a human than a robot.
- Question 3: How satisfied were you with the various capabilities of the chatbot?
 - User A:
 - Rating: 2
 - Comment: The capabilities were somewhat limited. It should do more.
 - User B:
 - Rating: 3
 - Comment: Well, all it really has to do is give bad advice which it does so I have no issues with it.
 - User C:
 - Rating: 3
 - Comment: It does more than some Discord bots I've used but it still doesn't do much overall.
- Question 4: Would you use this bot again?
 - User A: No, this bot is essentially useless.
 - User B: I'm gonna come to it for advice from now on.
 - User C: Nah probably not.