Name: Haodan (Caroline) Xue

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1   Brief description

On the basis of the previous assignment, I added a function of doing a psychological test to do a psychological test for a person, in order to determine whether or not his/her mental state during the current period is positive or negative. In addition to GUI, Stanford NLP and WordNet toolkits are also used.
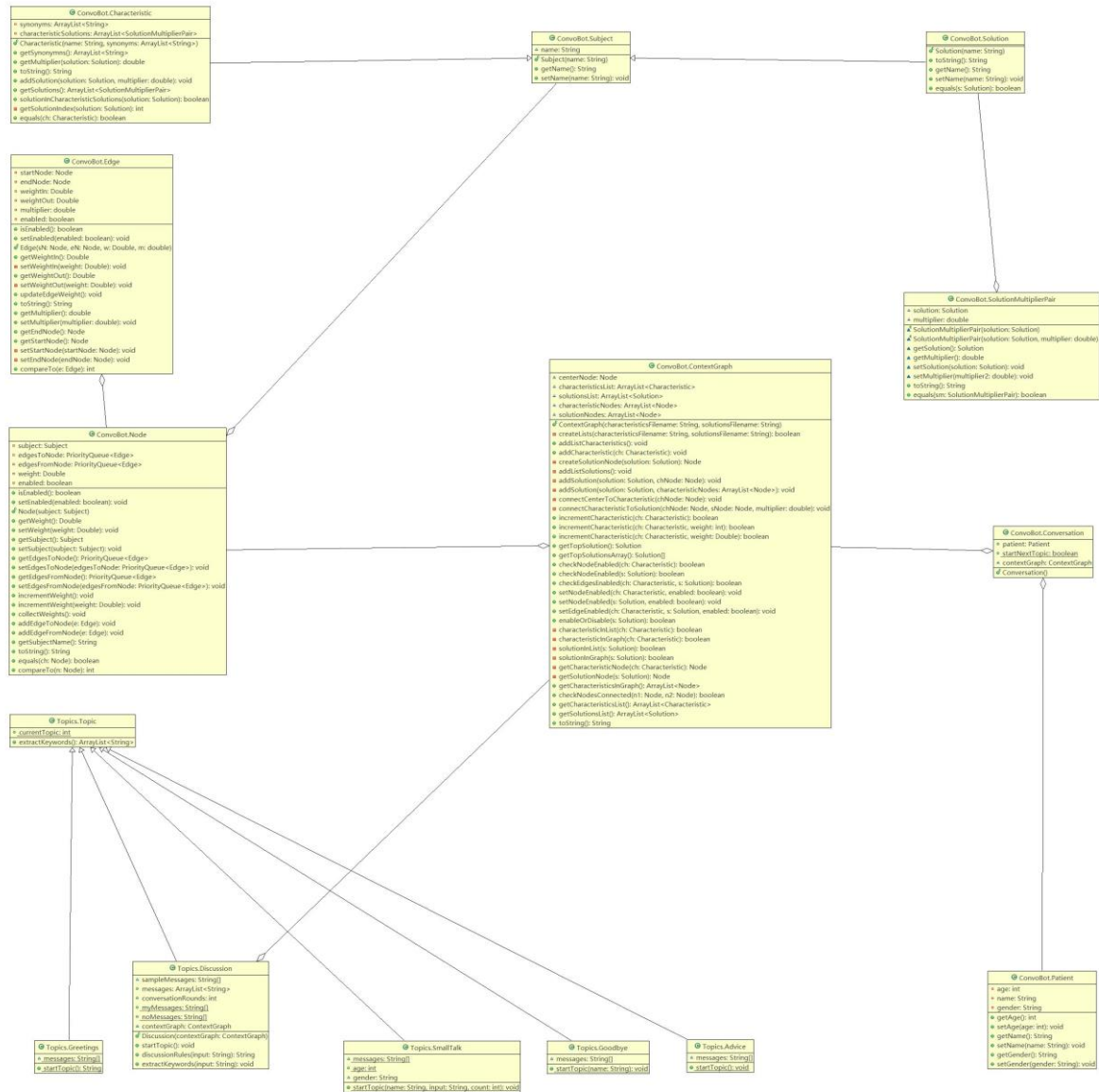

Figure 1: UML Diagram
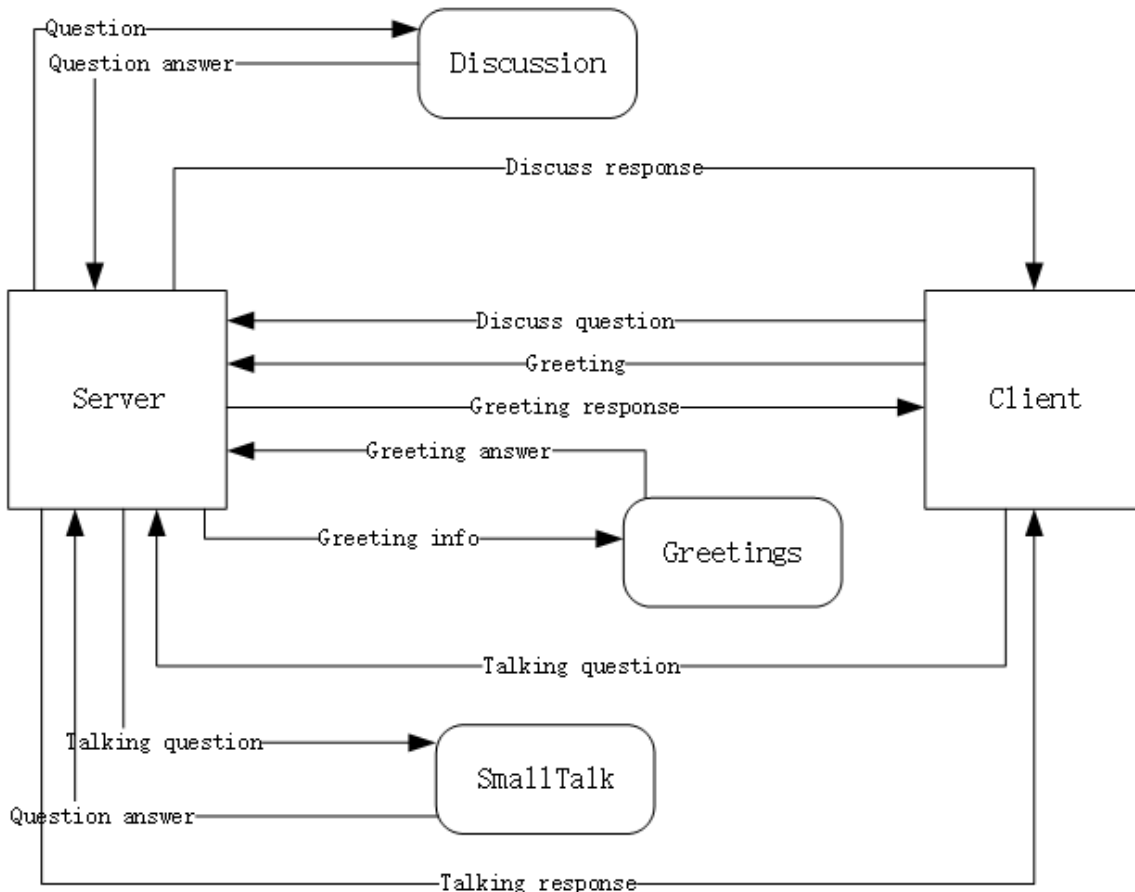
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Figure 2: Level 0 DFD

2   Function List and System Improvement

2.1   TestConversation class

Server-side Class Start Services. In the **TestConversation** class, I added a function menu to choose between therapy testing or psychological testing. If the input function does not match, the user will be asked to choose again.

2.2   Talking class

Client-side GUI interface. During chatting, the reason why it may take very long time and not receive responses from the server is because the tool analysis of OpenNLP is too slow. During this period, please do not enter anything. Otherwise, the input will be considered by the server as the input of next question.

2.3   Utils class

2.3.1   The public static ArrayList getSynonym (String words) method.
- Function: Synonym recognition gets all synonyms of parameter words.

2.3.2   Public static String sentiment (String line) method.
- Function: Sentiment analysis to analyze whether or not the emotions of sentences are positive or negative.

2.3.3   The public static ArrayList < String > getPOS (String field, String line) method.
- Function: POS tagging to obtain the corresponding part of speech word set.

2.3.4   The public static ArrayList < String > getNamed Entity Recognition (String field, String line) method.
- Function: Named entity recognition retrieves a collection of named entities of the corresponding type.

2.3.5   The Public static Array List < String > get Coreference Resolution (String line) method.
- Function: Coreference Resolution takes the same word key as the person in the sentence, which means the person in the sentence is the same.

2.3.6   The public static Boolean check (String sentence) method.
- Function: Check for erroneous words.

2.4   MyConversation class

Psychological test class.
- In this psychometric logic, you first ask the user about his/her **occupation**. Then, according to the Named entity record function, you first look at the words in the answer to see if the answer contains the words appeared in the word.txt. The word.txt is a lexicon.

  If the answer does not contain the words appeared in the word.txt, this means that the input is wrong. If the right words were said to be wrong words, it is because the information of the lexicon is incomplete. You can add a new column and find the word which its type is "TITLE" in the answer. This word is the **occupation** in the answer.
- Then ask the user's **gender**. POS tagging function finds the word which its part of speech is "NN" in the answer. That is, the noun, which is the gender noun in the answer.
- Then start the psychological test. Whenever asking a question, the corresponding answer will be analyzed by Sentiment Analysis function to determine whether the emotion of the answer is positive or negative. After the final test, the emotion of the user will be eventually determined based on the analysis result.

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3   Sample Output

```
robot:  what do you want to do,a psychological test or a psychotherapy
psychotherapy
robot:  *************Starting Greetings topic************
robot:  Hi! My name is Thebo (THErapy BOt). What's your name?
Lili
robot:  Welcome Lili, can I ask you a few questions before we start?
yes
robot:  **********Starting SmallTalk**********
robot:  Thank you! What do you do for work or school?
i am a student
robot:  **********Starting SmallTalk**********
robot:  Count = 1
robot:  You say that you are a  student. That sounds interesting. And how old are yo
i am 22
robot:  **********Starting SmallTalk**********
robot:  Count = 2
robot:  So you're 22. Thank you! Are you male or female?
female
robot:  **********Starting SmallTalk**********
robot:  Count = 3
robot:  So you're a girl!Thank you! That's all I needed. How are you feeling today?
robot:  current topic: 2
robot:  ******Starting Discussion*****
Tired
robot:  Do you excercise? It can help with sleeping better.
i do exercise
robot:  Good for you! Excercise has been proven to improve concentration, helps yo
```

Send

robot: Good for you! Excercise has been proven to improve concentration, helps y◄
yes
robot: Thats good, keeping a regular sleep schedule has been proven to improve sl
robot: The national sleep foundation reccomends 7 - 9 hours for adults between 18
robot: Apart from that you seem to have excellent sleep habits, if you have trouble
robot: Have you been feeling stressed or anxious lately?
maybe
robot: You?re not alone in that feeling. One in five university students suffer from a
yes
robot: That's good! I'm glad you're being proactive about you're problems. What el:
stressed
robot: I'm sorry to hear that, make sure to block out time for yourself to unwind.
robot: Remeber, things you can't change aren't worth worrying about! Whats been
school
robot: I'm sorry schools been so stressful lately. Hopefully it will be worth all of the
robot: You can try to free up some extra time by improving your time management
robot: Did you have anything else you wanted to talk about?
procrastinate
robot: There are many tools to help with procrastination! Have you tried keeping a j
yes
robot: It's good that you're trying to improve yourself! Procrastination can also be a
yes
robot: You?re not alone in that feeling. One in five university students suffer from a
yes
robot: That's good! I'm glad you're being proactive about you're problems. What el:
goodbye
robot: bye!

Send

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4   Development schedule

Schedule of Work			
Sub task	Start time	Time-consuming(days)	Completion time
Identify the required toolkits and technologies	2019-03-24	2	March 26th
Learning and Application of Standford CNLP	2019-03-26	8	April 3rd
Learning and Application of WordNet	2019-03-27	9	April 5th
Using GUI and add an extra topic	2019-03-31	3	April 3rd
Modify the code, debug the program	2019-03-27	9	April 5th