CSCI 538 – Artificial Intelligence
Assignment 1 - ELIZA Program
Spring 2019

Due Date: Wednesday, February 13, 2019
Total Points: 100

Part I (70 POINTS)

In this part of this assignment you are going to develop an ELIZA program similar to the original ELIZA that was introduced in 1966. In order to implement this program, you need to use a set of regular expression rules that would be able to respond in a similar way to the conversation shown below.

User	ELIZA
Men are all alike.	*In what way*
They're always bugging us about something or other.	*Can you think of a specific example*
Well, my boyfriend made me come here.	***Your boyfriend made you come here***
He says I am depressed much of the time.	*I am sorry to hear you are depressed*
It's true, I am unhappy.	*In what way are you unhappy*
I need some help; that much seems certain.	*What would it mean to you if you got some help*
Perhaps I could learn to get along with my mother.	*Tell me more about your family*
My mother takes care of me.	*Who else in your family takes care of you*
My father.	*Your father*
You are like my father in some ways.	*What resemblance do you see*
You are not very aggressive but I think you don't want me to notice that.	*What makes you think I am not very aggressive*
You don't argue with me.	***Why do you think I don't argue with you***
You are afraid of me.	*What makes you think I am afraid [of you]*
My father is afraid of everybody.	*What else comes to mind when you think of your father*
quit	

The programming language should be in Python. Make sure to run your ELIZA program on different dialogues including the one given to you. Your program should include the following:

1. Allows the user to enter one sentence, Eliza replies to what the user entered. Then, the user enters another sentence. This process repeats until the user enters the word "quit'. This terminates the program.
2. Your regular expression rules should be applied to one sentence at a time in order to extract the meaningful information.
3. Some regular expression rules have one response while other rules have more than one response. In case the regular expression has more than one response then your program should randomly choose between the possible replies.
4. The regular expression rules are ordered according to priority. Rules that appear first in the list are of higher priority.

5. In some rules you only need to write regular expressions that finds a keyword in an input sentence. We can see this case in the rule "%X alike %Y" where the response is generic and independent of the of the other contents of the sentence. Other rules require the regular expression to find the keyword and also extract other parts of the sentence.
6. Feel free to modify some of the rules from the list below so they return better responses.

Rules:

```
%X hello %Y
       Hi there. Please state your problem.
%X name %Y
       Great, good to know that.
       I am not interested in names
%X sorry %Y
       Please don't apologize.
       Apologies are not necessary.
       What feelings do you have when you apologize?
%X I remember %Y
       Do you often think of %Y?
       Does thinking of %Y bring anything else to mind?
       What else do you remember?
       Why do you recall %Y right now?
       %X if %Y
       Do you really think it is likely that %Y?
       Do you wish that %Y?
       What do you think about %Y?
       Really-- if %Y?
%X dream %Y
       Really-- %Y?
       What does this dream suggest to you?
       Do you dream often?
       Have you dreamt %Y before?
       %X dream about %Y?
       How do you feel about %Y in reality?
%X my mother %Y
       Who else in your family %Y?
       Tell me more about your family.
%X my father %Y
       %X my father %Y
       Your father?
       Does he influence you strongly?
       What else comes to mind when you think of your father?
%X I want %Y
       What would it mean for you if you got %Y
       Why do you want %Y
       Suppose you got %Y soon
%X I am glad %Y
       How have I helped you to be %Y
       What makes you happy just now
       Can you explain why you are suddenly %Y
%X I am sad %Y
       I am sorry to hear you are depressed
       I am sure it's not pleasant to be sad
%X are like %Y
       What resemblance do you see between %X and %Y
%X is like %Y
       In what way is it that %X is like %Y
       What resemblance do you see?
       Could there really be some connection?
%X alike %Y
       In what way?
       What similarities are there?
```

```
%X same %Y
       What other connections do you see?
%X I was %Y
       Were you really?
       Why do you tell me you were %Y now?
%X I am %Y
       In what way are you %Y
       Do you want to be %Y?
%X am I %Y
       Do you believe you are %Y
       Would you want to be %Y
       You wish I would tell you you are %Y
       What would it mean if you were %Y
%X you are %Y
       What makes you think I am %Y?
%X because %Y
       Is that the real reason?
       What other reasons might there be?
       Does that reason seem to explain anything else?
%X were you %Y
       Perhaps I was %Y
       What do you think?
       What if I had been %Y
%X I can't %Y
       Maybe you could %Y now
       What if you could %Y?
%X I feel %Y
       Do you often feel %Y?
%X I felt %Y
       What other feelings do you have?
%X why don't you %Y
       Should you %Y yourself?
       Do you believe I don't %Y
       Perhaps I will %Y in good time
%X yes %Y
       You seem quite positive
       Are you sure?
       I understand
%X no %Y
       Why not?
       You are being a bit negative
       Are you saying "NO" just to be negative?
%X someone %Y
       Can you be more specific?
%X everyone %Y
       Can you think of anyone in particular?
       Who for example?
%X always %Y
       Can you think of a specific example?
       What incident are you thinking of?
       Really—always
%X perhaps %Y
       You do not seem quite certain
%X are %Y
       Did you think they might not be %Y?
       Possibly they are %Y
%X
       Very interesting
       I am not sure I understand you fully
       Please continue
       Do you feel strongly about discussing such things?
```

Part II (30 POINTS)

Modify both your data rules and the ELIZA program in order to run in a different context. You may choose any domain other than a Rogerian psychologist. Run your program on at least on three different dialogues.

What to hand in

Submit your project electronically through D2L. Please hand in the following for each question:

- The set of rules used
- The Python program
- The dialogues used to test your program