

Artificial Intelligence (The ELIZA Program)

Objectives

- Read in command-line arguments
- Read in data from files
- Read in user input
- Create and loop through a 2-D array

Artificial Intelligence

ELIZA

ELIZA was an artificial intelligent system that plays “psychologist”. It is set up to respond to the user based on what they type, and then ask follow-up questions. An example transcript is shown below. The system responses are in black, the user’s responses are in blue.

I am the psychotherapist. Please, describe your problems. Each time you are finished talking, type RET twice.

I am unhappy.

Are you unhappy often?

Yes.

Can you elaborate on that?

Too much work.

Why do you say too much work?

I am working a lot.

Earlier you said you felt unhappy?

Yes.

I would appreciate it if you would continue.

Well, I don't know what to do.

Maybe your plans have something to do with this.

No they don't.

Go on, don't be afraid.

I'm depressed.

What causes you to be depressed?

There are plenty of example programs emulating ELIZA on the internet. For example,

<http://www.masswerk.at/eliza/>



ELIZA was a computer program written by Joseph Weizenbaum [2] of MIT University in the late 60s which is considered to be the first chatterbot, i.e. a program that can partially mimic a human in a conversation with a human. In many ways ELIZA has provided insights not just into what a serious NLP system should achieve but also has provided a lot of insight into human reactions to computer systems which look like “intelligent” systems but are not so. ELIZA was not meant to be an AI system, it was meant to be a toy or a parody system.

As Weizenbaum mentions ELIZA was supposed “to play (or rather, parody) the role of a Rogerian psychotherapist engaged in an initial interview with a patient” [1]. However, the reaction to the ELIZA program by the test subjects was completely unexpected and many formed an emotional attachment to the “therapist”. Weizenbaum was very disturbed by the unexpected reaction to ELIZA by lay and that was one of the reasons why he wrote the book “Computer Power and Human Reason” an attempt to clarify his position on computer science, AI, and its relations to human society.

More detailed information about ELIZA:

<http://www.cs.umd.edu/class/fall2012/cmsc828d/oldreportfiles/guha1.pdf>

AI about C++

Your program will act ‘smart’ like the ELIZA program but deal questions about C++! And we will call it CLiza as a play on ELIZA. The goal is to have responses for particular keywords about the C++ programming language. When the user enters a keyword, you will look for these keywords in the list of keyword/response pairs to figure out what response to give.

You will get the name of a file from command-line-arguments. Each line in the file has a one-word description of a topic keyword, the ‘@’ sign as a delimiter, and then the response to the user based on the topic keyword.

Your program will read in this file, create a 2-D array, and store the topic keywords in the first column of the array and the responses in the second column in the array. *Since we don’t know how big the file is, create the array to be a size of 100 rows.*

Then you will prompt the user for a topic using this exact wording:
“What question do you have about C++?”.

Read in a keyword from the user.

Loop through the keywords in your 2D array and check to see if the keyword matches the user’s input. If it does, then use the matching response to print back to the user.

If you loop through the entire list of keywords and do not find a match, then print to the user this exact output: “Sorry, I don’t know. What else can we talk about?”

Lastly, the user should be able to type “quit” at any time to quit the program.

Example

responses.txt

```
syntax@C++ is case-sensitive.
loops@There are 3 types of loops in C++: while, do...while, and for loops.
loop@A loop is used for repeating statements multiple times.
array@An array is designated using square brackets.
list@A list is represented as an array in C++.
switch@Switch statements are another form of an if-else if-else type statement.
variable@A variable must be declared with a data type.
```

Example run (Program output is in black, what the user types while interacting with the program are shown in blue).

```
What question do you have about C++?
loop
A loop is used for repeating statements multiple times.
loops
There are 3 types of loops in C++: while, do...while, and for loops.
list
A list is represented as an array in C++.
array
An array is designated using square brackets.
quit
```

Hint: For getting the keyword and the response, take the string and find the index of the delimiter '@', then use `substr` to find the keyword and `substr` again to get the response.

Additional Requirements

- The name of the file must be called **CppLiza.cpp**
- Comments at the top of your program
 - Your name
 - Date
 - Assignment #8
 - Brief description of the assignment (one or two lines max)
- Comments throughout your program explaining what it is doing
- The program takes one command-line argument:
`responses_filename`
- You may not create your own functions, classes, linked lists, or Vectors (*e.g., do not use things that we have not covered yet unless you get permission from the instructor first*).
- The output must match exactly to the examples provided (given appropriate inputs).



- If you do not use command-line arguments for the name of the file then you will receive a zero for this assignment.
- You may only read the data file once! Make sure you loop through the 2D array to provide the answers, do not re-open the data file.
- *We will run your program with different input files. So test by changing and using different example files!*
- Program must be written in C++ and submitted in Moodle.
- Zip the CppLiza.cpp and submit to Moodle as ***Firstname_Lastname_HW8.zip***.