CSC 204 Lab 8: Using If Statements--The Chatbot

From Eliza in the 1960s to Siri, Alexa, Google Assistant, and Watson today, the idea of talking to computers in natural language has fascinated people. More and more computer programs let people interact with them by typing (or speaking) English sentences. The field of computer science that addresses how computers can understand human language is called Natural Language Processing (NLP).

NLP is a field that attempts to have computers understand natural (i.e. human) language. There are many exciting break-throughs in the field. While NLP is a complicated field, it is fairly easy to create a simple program to respond to English sentences.

For this lab, you'll explore some of the basics of NLP. As you do it, you'll work with a variety of methods of the String class and practice using the `if` statement. You'll trace a complicated method to find words in user input.

Make a copy of this lab and store it on your Google Drive for the class. Name it "Lab 8 - YourName" (without quotes). Fill in answers to questions as you go along.

Activity 1: Getting Acquainted with Chatbots

Chatbots are programs which are designed to respond like humans to natural language input. Before you write code to create your own chatbot, you will explore some existing chatbots.

Start:

Go to https://sites.google.com/site/webtoolsbox/bots . Try out several of the chatbots and find one to use for this activity.

Exploration:

Have several conversations with **BearBot** and answer the following questions.
How does it respond to "where do you come from?"
In response to "Where do you come from?" its answer was "I am originally from England. Now I live in Yorkshire. Where are you?"

What's the most interesting response?
When you type in the same word over and over again, it goes on a strike until you type in another word.

What's the most peculiar response?
I asked "why are we here" and its answer was "Humans are part of an alien experiment which went wrong."

How does it respond to asdfghjkl;?
In response to "asdfghjkl;" its answer was "Sorry to change the subject, but if I make a mistake or my reply doesn't make sense, just say 'bad answer" to me and you can correct me. Did you know that?"

Exercises: Work with another person and have 2 different chatbots converse with each other.

Questions:

Simple chatbots act by looking for keywords or phrases and responding to them.

1. Can you identify keywords to which your chatbot responds?
   Alive, Humans, AI, Square Bear, Bot
2. Think of several keywords and the responses they might cause.
   If you ask about if the bot is sentient, it will respond with how it is an AI, a bot or who its creator is and if you ask if it has emotions, it responds with that humans are the ones capable of it and loops back to how it is a bot. If you type in "yes" or "no" in response to a question Bearbot asked you, then Bearbot will be happy, but if you type in "yes" or "no" randomly, it will reply with random singular words which a person may respond with if someone said "yes" or "no" to them randomly in real life.

Activity 2: Introduction to the Magpie Class

In this activity, you'll work with Magpie, a simple implementation of a Chatbot. You'll see how it works with some keywords and add some more keywords of your own.

Prepare:

In Eclipse, create a Lab 8 project, save it in your workspace (maybe on Orion). Copy the 2 files from Blackhawk Lab8 folder into your project's src folder.

Start:

Run the program in MagpieRunner.
How does it respond to:

- My mother and I talked last night.
- I said no!
- The weather is nice.
- Do you know my brother?

```
Hello, let's talk.
My mother and I talked last night.
Tell me more about your family.
I said no!
Why so negative?
The weather is nice
You don't say.
Do you know my brother?
Why so negative?
```

Exploration:

Look at the code. See how the `if` statement assigns a value to the response and returns that response. The method `getRandomResponse` picks a response from a group of Strings.

Exercises:

Alter the code:

- Have it respond "Tell me more about your pets." when the statement contains the word "dog" or "cat." For example, a possible statement and response would be:

  Statement: I like my cat Mittens.

  Response: Tell me more about your pets.

- Have it respond favourably when it sees the name of your teacher. Be sure to use appropriate pronouns! For example, a possible statement and response would be:

  Statement: Dr. Allen is telling us about chatbots.

  Response: Sounds like you have a good teacher.
- Have the code check that the statement has at least one character. You can do this by using the trim method to remove spaces from the beginning and end and then checking the length of the trimmed string. If there aren't any characters, the response should tell the user to enter something. For example, a possible statement and response would be:

  Statement:

  Response: Say something, please.
- Add two more noncommittal responses to the possible random responses.
- Pick three more keywords, like "no" and "brother" and edit the `getResponse` method to respond to each of these. Put the three keywords and the response below:

keyword	Response
no	"Oh, I'm sorry I asked." and "Please don't hit me!"
brother	"What's your brother's name?" and "Did he go to Mercer University?"
(nothing entered)	"… Are you going to type something?" and "Hurry up, I've not got all day…"

- What happens when more than one keyword appears in a string? Consider the string "My mother has a dog but no cat." Explain how to prioritize responses in the reply method.

Eclipse will go in the order of the "else if" statements until a singular keyboard is entered.
If "dog" was entered, "Tell me more about your pets" would be the response.
If "dog mother" was entered, the response would be "Tell me more about your family" since "mother is the first keyboard entered in the "else if" statements and would respond with that.

Question:

What happens when a keyword is included in another word? Consider statements like "I know all the state capitals." and "I like vegetables smothered in cheese." Explain the problem with the responses to these statements.

It will be the same as the above, if it picks up a keyword inside a string, the response for that keyword will be used. In the statement "I know all the state capitals", the response will be "why so negative" since it picks up the keyword "no".

Deliverables

Copy your Eclipse project's src folder to your shared Google folder, and rename it "Lab8". Move your copy of this document into your Lab8 folder on Google Drive.