Eric Heitman

Chatterboy: An Academic Assistant

Project Assignment #1: Write-Up

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Chatterboy: An Academic Assistant

Background:

The introduction to a college career for some aspiring computer scientists can be somewhat daunting. While trying to acquire new knowledge in the introductory concepts of computer science, a balance between general education requirements and other major-required courses must be maintained. Students will tend to struggle in courses which are not related directly to their program of study, potentially compromising a high overall GPA. Ultimately, this can lead to potentially harmful effects, such as reduction of internship and job-related opportunities or potentially dropping out of school altogether. Therefore, a solution which can guide a student to academic success in a wide array of subjects must be identified.

Hypothesis:

In order to guide a student to academic success, they must have a way to access and research topics which they are unfamiliar with. Luckily, the internet exists as a valuable resource for anyone with a burning question. However, internet searches tend to be very broad, and can sometimes lead a student down the wrong path. In order to simplify this process and ease worried minds, let's make it personal. With the implementation of a tool such as a chatbot, a student can say hello, and ask a question to receive a response to a question they may have about a potential roadblock in the resources available online. This begs the question, how can a chatbot be implemented and tested as to simulate a one-on-one interaction between an individual and say, a professor or advisor?

Data:

In order to efficiently implement a chatbot, a simplified programming language was used. The popular programming language Python was leveraged for this task, as there are many language processing tools available which will be used for interpreting a user's input and analysis by the bot. The data which was used in this project was the language processing tool coupled with the input from the user. Potential issues with the data involved matching up proper inputs to outputs from the chatbot. For example, if a user typed "I would like help with researching Psychology," the response should not have been something like "My name is Chatterboy!" This was mediated by altering the input string requirements for desired responses, and making each of them unique.

Analysis Steps:

First, a proper Python IDE was downloaded in order to write, test, and execute Python code. A Python file was created, importing the relevant packages and tools in order to begin writing out the program. The program was able to identify input from the user, send it to the chatbot, and have the chatbot display a response along with the user's initial input in the terminal. By leveraging the Python library nltk.chat.util, I was able to effectively process words so that the chatbot could understand what the user was typing. Hence, the chatbot was able to reference the key value pair linked to the user's question and output the proper response. Customizable responses to questions with links displaying references to the user's question about aid with subject matter were provided, such as responses for "I need help with programming". The end product allowed for a user to provide the chatbot with a question regarding needing a good reference website for a subject, and the chatbot returning that resource to the user.

Results:

In the resulting program, I provided resources for the following subject areas in the key value pairs: Psychology, Computer Science, Science, and Math. When a user would type in a string similar to: “I need help in Math,” the chatbot would reply with the website I deemed most relevant to Math queries. I also incorporated different greetings to add realism to the chatbot, such as when a user would say “My name is user,” the chatbot would reply with, “Hello user, my name is Chatterboy!” All of these entries and responses were outputted into the Python terminal window.

Challenges and Roadblocks:

Issues surrounding the ease of accounting for a wide array of responses from a user and responses from the bot will need to be taken into consideration if this project is to expand moving forward. Issues with importing the proper packages, implementing proper syntax, and handling errors with the bot may also need to be considered in the future. At this point and time, there are not any straightforward methods leveraging the nltk python library to set up conditional statements to distinguish similar responses from one another. This was something which needed to be considered in creating the bot, and was ultimately remedied through altering string inputs for similar responses.

Reflection:

The project, I feel, was a great success in establishing a strong foundation for a chatbot with the ability to assist students in areas of academic shortcomings of students. By developing python code to interact with a user in the terminal and provide them with basic, general references for a select few subjects, the project was able to display potential for a larger, more integrated

solution. In the future, it is my intention to develop this idea further, and potentially have the program read in specific files containing common inputs and outputs, so that customized responses do not need to be as prevalent in the code in the key value pairs. Additionally, I hope to create some type of GUI for the user as well to aid with readability.