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NIP1 — NIP1 TASK 1: CHATBOT

The chatbot was designed to help students in deciding their career path by asking them a series of questions, and based off of the supplied answers, the chatbot recommends to them a career path that suits their experience and interests. This bot will be able to relieve the career advising team of being overloaded by students asking for simple career advice. With those small requests and questions no longer burdening the career advising team, they will be able to focus on the more complex questions that are asked by the students. This will ultimately result in a less exhausted team, as well as, reducing the overall wait time that student experience when reaching out to the career advising team.

Nick Ismail's 2019 article published on Information Age provided insight into the importance of mapping out how a chatbot functions during the requirements and design phase. This emphasizes how making the bot's behavior predictable makes it more secure (Ismail, 2019).

Published as an article in 2018 on Ayehu, Gabby Nizri illustrated how to define how you measure success when implementing a chat bot. This was incredibly helpful by providing perspective on how to determine the appropriate metrics to track (Nizri, 2018).

With chat bots, it is important to identify and provide value to a user that is preferable to a human counterpart. Juned Chanchi's 2019 article on Chatbotslife helped me analyze and implement the GlassDoor job results page as a value to the user (Chanchi, 2019).

The article on Chatbotsjournal written by Gina Shaw on January 9, 2020 emphasized how important the ability for a chatbot to hand off the conversation to a human agent if need be. This inspired me to build functionality into the bot to communicate to the user that an appointment will need to be made (Shaw, 2020).

Snigdha Patel's article published on December 24, 2019 by Revechat was instrumental in the development of the chatbot by showing many examples of chatbot implementations by very well known companies. This helped me determine how to lead the conversation with the chatbot to ensure a predictable outcome (Patel, 2019).

As you will be able to see in the included chatbot codebase, the chatbot has the ability to recommend five different jobs in technology based on the user's input. I picked jobs from specific categories as it made it easier to ask the right questions to the user. I picked two jobs that were focused on systems administration: Linux Architect and

Database Administrator. I then identified two other jobs focused more on software development: Software Engineer and Web Developer. Lastly I picked one that was a middle ground between the two categories: Devops Engineer.

The first step in training the chatbot was identifying the technology careers that I wanted to target with the bot and grouping them in ways that would simplify the decision trees that the bot would need to traverse.

The chatbot was then tested in its ability to communicate with a user. I determined that the best way to tackle communication between the user was to put the conversation on rails. I did this by using the reply function in AIML to force the user into only answering questions with yes or no. If the user deviates from the chatbot's directed path, the chatbot then recommends the user to set up an appointment with a career advisor for further assistance.

I then tested all of the functions of the bot by traversing the bot's decision tree to ensure that it was working consistently and correctly. An example of how I tested it was by impersonating a student needing help. After engaging the bot, the bot introduces itself to me and asks me if I have an experience or interest in systems administration. I answer yes to the question. Next it asks me if I have any Linux experience. Answering yes to that question prompts the chatbot to recommend that the user look into becoming a Linux Architect and provides the user with an overview and link to a jobs website.

Another example of testing the chatbot interacting with it again, but providing it with a different set of answers. This time, I answered no to having experience or interest in systems administration. The bot then asks if I have an experience or interest in software development. If yes, the bot then inquires as to if the user has any experience or interest in web development. If the question is answered with a "yes", the bot recommends that the user become a Web Developer and provides the user with information about the career and a link to job listings.

To optimize the bot, I hand picked job careers that would make the decision tree that the bot would have to traverse incredibly simple. This allows the development and implementation of the bot to be easy and predictable.   Also, to reduce the user's likeliness of traveling outside of the bot's directed conversation, I implemented the quick reply functionality that is provided by pandorabots and AIML to encourage the user to quickly click through the bot and avoid using the chat text area. While the text area

does still function, any attempt to steer the conversation by the user results in the chatbot telling the user to make an appointment for assistance.

The metrics needed to measure the bots effectiveness were difficult to determine. The ability of the bot to quickly determine the best fit career for a student was very important. In most cases, the bot reaches a decision after three targeted questions. There is one case where the bot can reach its conclusion in only two. The bot is also able to function as a catch-all by recommending that the user make an appointment while also providing the user with the avenue for doing just that. The bot also is very effective on providing the user with the resources to help find available jobs in the market.

The bot in its current state does not need much maintenance. Updating links and email addresses could be required, but in general it should be able to run smoothly for a long time. If other features are added, the maintenance could balloon and become quite cumbersome. Improvements could be determined by looking at the logs of the bot and gathering information on what kinds of questions that the users are asking the bots and building functionality to handle those common cases.

Designing and implementing the bot was quite challenging. Learning AIML and Pandorabots took some time. I was able to leverage a Udemy course that was recommended by Pandorabots to reduce the learning curve and speed up the process. Also, selecting the right jobs was very important. Fortunately for me, I was able to put a lot of my domain knowledge and experience to be able to determine the right careers and the right questions to ask. This simplified the entire development process for me tremendously and save me time in the long run.

Using Pandorabots for developing the bot made the process generally pain-free. Pandorabots being a web application made switching workstations and working while not at my desk trivial. The service also allows for bots to work together effortlessly and allows for building bots for specific functions that can be reusable.

A weakness of using Pandorabots was that it relied fully on a web platform. This created some scenarios where not having an available network restricted my ability to test the bot. Since it was written in AIML, I could use any basic code editor, but without a network connection, access to the chatbot engine was denied. Fortunately, that was not a common scenario.

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How-To Installation Guide:
1. Download the included archive
2. Extract the included archive
3. Log in to pandorabots.com
4. On the left side of the dashboard, click the "+" button next to "MY BOTS"
5. Enter a name for the bot and user defaults for the rest of the fields
6. Once created, open up the Code Editor for the bot
7. Click File -> Upload
8. Select the extracted archive

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