

Pokemon Recommendation Chatbot

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Knowledge Based Systems

Design and implementation of a chatbot in the
context of Pokémon recommendation

Jan Bellavista, Marc Escoté & Spencer James Johnson

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Abstract

The Pokémon Recommendation Chatbot project aims to build a personalized and interactive chatbot system to help users find the Pokémon that most closely matches their way of being. With the increasing popularity of Pokémon and the large number of species that exist, this chatbot leverages user input and a comprehensive collection of Pokémon traits, skills, and kinds as a suggestion tool.

The knowledge-based technique of this project employs a questionnaire to gather information on the user's personality characteristics and preferences. The responses are then matched with the appropriate Pokémon traits using a recommendation method that creates a compatibility score. Additional factors are used to increase the suggestions' accuracy, such as Pokémon kinds and user preferences.

The chatbot interface offers consumers a simple and fun way to communicate with the program. Users obtain individualized suggestions along with pertinent information about the suggested Pokémon, such as its name, picture, and important characteristics, through a series of guided questions and comments.

The introduction of this Pokémon recommendation chatbot intends to give Pokémon fans and enthusiasts a fun and personalized experience. The chatbot provides a unique and enjoyable method for locating the best Pokémon based on unique tastes and features by fusing user input, Pokémon data, and a recommendation algorithm.

Keywords: Chatbot, Pokémon, User Preferences, Personality Traits, and Compatibility Score.

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1. Introduction

1.1 Context

In the Knowledge-Based Systems Project for the academic year 2022/23, we were asked to design and implement a recommendation system with the support of a chatbot. We were required to investigate the concept of chatbots, what their functionalities they have, and design the considerations that we found necessary. Additionally, we had to choose a domain, define a problem that we would address, and finally, develop an effective chatbot that a user could interact with. The main goal consisted on getting an accurate recommendation in relation to the chosen domain.

1.2 Chatbot Definition

According to the Cambridge Dictionary, a chatbot can be defined as:

A computer program designed to have a conversation with a human being, especially over the internet.

Artificial intelligence (AI) software, called a chatbot, uses natural language processing to mimic human conversation and communicate with people. To understand user queries or orders and provide a response, it combines pre-programmed answers with machine learning techniques. The goal of chatbots is to enable automated and effective communication by helping users complete tasks, responding to questions, or making suggestions. Chatbots can be used in a variety of platforms, including messaging applications, websites, or voice assistants.

1.3 Brief History of Chatbots

The history of chatbots spans several decades. The creation of ELIZA, a computer intended to mimic discussion with a psychiatrist, gave rise to the idea of conversational agents and automated dialogue systems in the 1960s. In order to communicate via text, ELIZA employed pattern matching and basic linguistic conventions.

Rule-based systems and expert systems were introduced in the years that followed, advancing chatbot technology even further. When a user input is received, rule-based chatbots employ predetermined sets of rules to answer, whereas expert systems use domain-specific knowledge to offer more specialized assistance.

The development of chatbots like A.L.I.C.E. (Artificial Linguistic Internet Computer Entity), which used natural language processing to provide increasingly complex interactions, began in the 1990s. A.L.I.C.E. used pattern matching, language parsing, and knowledge databases to replicate human-like interactions.

The emergence of the internet and messaging services enhanced the accessibility and popularity of chatbots. Companies started using chatbots for interactive experiences, information retrieval, and customer service. Artificial intelligence and machine learning advancements have

further enhanced chatbot capabilities by enabling more sophisticated sentiment analysis, natural language understanding, and context-aware answers.

Chatbots have grown in popularity over the past several years across a number of industries, including e-commerce, healthcare, and virtual assistants. Deep learning models, neural networks, and reinforcement learning approaches are now available, enabling more sophisticated and interesting dialogues.

Chatbots are anticipated to play a crucial role in boosting user experiences, simplifying corporate procedures, and promoting effective communication between humans and machines as technology continues to advance. Even more advanced conversational agents with the ability to comprehend users and reply in increasingly natural and context-relevant ways are what the future of chatbots have in store.

1.4 Our Chatbot

In line with the project requirements, our idea revolves around developing a chatbot that recommends a Pokémon based on a user's personality. The chatbot will converse with the user and filter information about their preferences, character characteristics, and hobbies. The chatbot will produce tailored Pokémon suggestions for the user, based on their replies and personality. In order to help Pokémon fans choose their ideal Pokémon partner, the project aims to give them an engaging and entertaining experience. Our chatbot will provide precise and customized suggestions by combining natural language processing and knowledge-based reasoning, improving the user's overall Pokémon experience. Throughout the development of the project, we aimed to demonstrate the practical applications of natural language processing in order to create a recommendation system, showcasing how it can be utilized to enhance users experience in specific domains, such as our Pokémon choice.

2. Proposal

2.1 Problem description

During the early stages of our project, we thought of a domain that would not only attract consumers but also effectively solve a significant issue. We realized the importance of the relationship between users and the video game characters they select to play with. By enabling consumers to fully identify with their selected character, we hoped to improve the experience people had when playing games. We chose the Pokémon domain as our major focus in order to have a more efficient development process and take advantage of the popularity of the Pokémon franchise. Through our exploration of the Pokémon universe, we aimed to develop a chatbot that would suggest Pokémon characters based on a user's characteristics, allowing gamers to establish stronger bonds with their virtual friends. With this strategy, we hoped to provide Pokémon fans a customized experience that would improve their gameplay experience.

2.2 Solution

This project was developed in Python using the power of natural language processing techniques. As mentioned before, the goal of our project is to create a chatbot that makes Pokémon suggestions based on a user's personality test.

The intention of this chatbot is to ask questions to the users for the purpose of learning about their preferences, personality traits, and interests. The chatbot will examine and understand the user's replies using natural language processing techniques to gather the most important data about their personality and interests.

Our chatbot will use a knowledge-based reasoning algorithm to offer precise and customized Pokémon advice. This system will integrate a comprehensive database of Pokémon attributes, characteristics, and compatibility factors. By combining the user's input with this knowledge base, the chatbot will generate personalized recommendations that align as much as possible with the user's personality.

Our project's main objective is to improve user's experiences with Pokémon by giving them a fun and enjoyable way to choose their ideal Pokémon companion. Our chatbot will provide accurate and personalized advice to customers, assisting them in finding the ideal Pokémon buddy by utilizing the capabilities of natural language processing and knowledge-based reasoning.

In order to facilitate the interaction between the chatbot and users but also provide the best user experience, we used Telegram's API to load our project there so users will be able to use the chatbot with an app that can be downloaded in any smartphone or computer. By using Telegram's messaging platform, we were able to deploy our chatbot directly within the Telegram application, this integration allowed users to easily access and interact with the chatbot, all within the familiar Telegram interface. The utilization of Telegram's API enhanced the accessibility and convenience of our chatbot, enabling users to effortlessly use this recommendation system.

Throughout the development of the project, we aimed to demonstrate the practical applications of natural language processing in order to create a recommendation system, showcasing how it can be utilized to enhance users experience in specific domains, such as our Pokémon choice.

2.3 Knowledge

The Pokémon Recommendation Chatbot' knowledge base was built using the Pokémon data that was gathered from the PokeAPI (explained in detail in section 3.2) where numerous details regarding different Pokémon species, including their qualities, skills, attributes, types, evolutionary history, and more can be found.

There are many major categories into which the knowledge base may be divided:

- **Pokémon Attributes:** These attributes give details on the physical traits of each Pokémon, such as height, weight, color, and shape.
- **Pokémon Abilities:** Special capabilities, advantages, and disadvantages that each Pokémon possesses. Essential for matching user preferences with the most appropriate Pokémon suggestions.
- **Pokémon Types:** There are many distinct types of Pokémon, including Fire, Water, Grass, Electric...
- **Pokémon Evolution:** We retrieve the evolutionary relationships between Pokémon species from the API.

In order to effectively retrieve and use the data gathered, it must be organized in a systematic way for the knowledge base's design. It entails developing suitable data structures, such as dictionaries or classes, to describe the characteristics and connections of each Pokémon.

Overall, the knowledge base acts as a thorough archive of Pokémon data, enabling the chatbot to make use of this information to produce tailored suggestions and give consumers complete information about different Pokémon species.

3. Software implementation

Considering the context of this project, Python was the best option to choose as the programming language due to its adaptability, simplicity, and comprehensive support for NLP tasks. Python is a logical choice for creating a chatbot due to how easy it is to comprehend and produce dialogues that are human-like since it has a large ecosystem of tools and frameworks designed for NLP.

The clean syntax and easy readability of code that Python offers was also very important when developing the chatbot. The straightforward structure was appreciated making it very easy to learn how to code since it was our first time using this language.

Furthermore, all the tutorials, information and Python's active community facilitated the problem solving and debugging of the code, ensuring a more efficient development experience.

Lastly, Python's compatibility with platforms such as Telegram which we used to integrate our chatbot, made it a clear choice for our project requirements.

Overall, thanks to all the powerful and very useful NLP libraries that Python offers, and high compatibility with external platforms and APIs, the development of the project using this language was very entertaining and interesting to work on.

3.2 Extracting data

The <https://pokeapi.co> API data extraction was a critical component of our approach. The PokeAPI offered a thorough and trustworthy source of information on Pokémon, including information on their traits, skills, kinds, and many more attributes. By utilizing this API, we have access to a sizable database of Pokémon data, allowing our chatbot to give consumers accurate and updated information.

With the help of this API, we were able to quickly and easily get particular Pokémon data using a straightforward request mechanism. For information like a Pokémon's name, height, weight, and even its evolutionary history, we could quickly access the API. Making HTTP calls to the API's endpoints and parsing the JSON answers that were returned allowed for the data extraction procedure.

We made sure that our chatbot could provide users accurate information about Pokémon by making use of the PokeAPI. This improved our recommendation algorithm and improved the user experience overall. Our chatbot was able to dynamically gather and deliver the most pertinent and up-to-date Pokémon information thanks to the integration of the data extraction capabilities, keeping users interested and informed throughout their contact with the chatbot.

3.3 Generating responses

To offer a smooth and usable user experience, we decided to connect our chatbot to the Telegram platform, a popular messaging service app that has a large user base and an easy-to-

use design. By linking our chatbot to Telegram, we made it accessible to everyone who uses the app and made it simple for people to find and communicate with our chatbot.

Users may easily access our chatbot over Telegram without doing any additional installs or preparations. The Telegram app allows users to easily search for our chatbot, start a conversation, and begin interacting with it. Users were able to interact with our chatbot right away thanks to this simplified method, which removed all complications to access it.

The rich features and capabilities that Telegram provides further improved the operation of our chatbot. By enabling the chatbot to show Pokémon pictures and related media, it improved the user experience by supporting multimedia material, including photographs of the recommended Pokémon. Additionally, Telegram's messaging platform made it possible for users to communicate with our chatbot in real-time, with reliability and providing quick questions to user replies making the discussion flow very naturally.

Overall, the Telegram integration made our chatbot more widely accessible and gave consumers a convenient way to communicate with our recommendation engine. We were able to reach a wider audience and provide a smooth and interesting chatbot experience by using Telegram's capabilities and user base.

4. Result & Tests

The Pokémon Recommendation Chatbot project was effective in achieving its goals of improving the overall Pokémon experience and offering tailored Pokémon choices depending on user input. The chatbot was able to learn about user preferences, assess personality features, and produce precise Pokémon suggestions by using knowledge-based reasoning and natural language processing techniques.

The PokeAPI (Pokémon API) connection assisted the chatbot's recommendation system, ensuring that consumers got current and pertinent information regarding Pokémon species, qualities, and characteristics. The chatbot may pull useful information from the huge database made available by the PokeAPI and utilize it to provide personalized suggestions for each user.

Throughout the development process, rigorous testing was conducted to ensure the chatbot's correct functioning, accuracy, and user-friendliness. To assess the chatbot's capacity to comprehend user input, and offer tailored Pokémon suggestions, several tests were run asking some colleagues and friends to try the chatbot in order to give us feedback. The testers gave positive feedback when playing with the bot demonstrating the correct functioning and the capability of understanding user inputs to generate accurate recommendations.

The chatbot received highly good user feedback, with many users praising the tailored Pokémon suggestions and the entire user experience. The chatbot's accessibility through the Telegram platform was well-liked by users since it made it simple for them to start discussions and get suggestions without the need for any additional installs or registrations.

5. Final appraisal

Pros: The suggested chatbot solution comes with a number of benefits. First of all, it boosts productivity by automating processes and offering prompt and precise solutions. Through a user-friendly UI and natural language interaction, it improves user experience. Thirdly, it guarantees constant accessibility, enabling consumers to talk to it whenever they want. Last but not least, it offers scalability making this chatbot be able to recommend characters for other games.

Cons: The Chatbot system has certain drawbacks despite its advantages. For example, it can have trouble recommending Pokémon if difficult or confusing answers that are not part of its preset knowledge base are answered.

6. Conclusions & Future Ideas

In conclusion, the Pokémon Recommendation Chatbot project was successful in creating an interactive and personalized chatbot system to help users identify the Pokémon that most closely resembles their personality.

The chatbot efficiently understands user responses, then it compares it to Pokémon features and attributes, and produces precise suggestions by using natural language processing and knowledge-based reasoning. Utilizing the PokeAPI ensured access to the most recent Pokémon data, further enhancing the user experience and recommendation system.

The chatbot's connection with the Telegram platform made it more accessible and provide users a nice interface for communication. Users are able to interact with the chatbot and obtain tailored Pokémon suggestions within the comfortable messaging app.

Globally, the Pokémon Recommendation Chatbot project showed how chatbot technology can be used to improve user experiences and offer personalized suggestions. Extending the knowledge base, introducing more sophisticated natural language processing methods, and connecting the chatbot with new platforms or voice assistants might all be considered as future possibilities for development.

Some other future ideas include:

1. **Improved Recommendation Algorithm:** Add machine learning strategies to the recommendation algorithm. This would enable the chatbot to gain knowledge from user responses and eventually offer more precise and individualized Pokémon suggestions.
2. **Natural Language Processing:** Expand the chatbot's ability to improve the processing the natural language to comprehend user input and context.
3. **Support for several languages:** Increase the chatbot's linguistic capabilities to serve a larger user base. This would help give suggestions in several languages and could

include creating a language translation technology and introducing support for numerous languages.

4. User feedback: Implementing a rating system or performing user surveys to gauge user satisfaction and improve areas that are criticised.

Overall, the Pokémon Recommendation Chatbot has a lot of room for improvement and growth. The chatbot may benefit Pokémon lovers by offering them individualized suggestions, current information, and an engaging user experience by embracing these next concepts.

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