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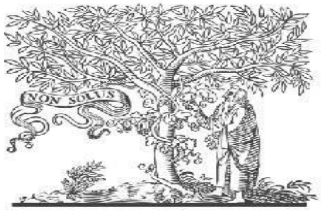

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College Enquiry Chatbot Using AI

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Abstract
The College bot is a Graphical User Interface based application built using Artificial Intelligence algorithms that analyze users' queries and understand the user's message and resolve it. The student just has to query through the bot, the responses are appropriate and accurate. The user can query any college-related activities starting from Blue Print to statistics related to college like placement percentage graphs. This system is developed using Python Programming Language and AI (RNN).

The chatbot is designed to answer questions related to college admission procedures, eligibility criteria, course details, fees, scholarships, campus life, and other relevant topics. It uses a database of frequently asked questions and answers to provide instant responses to the user's queries.

The chatbot is accessible through various platforms such as websites, mobile apps, or social media channels. It provides an intuitive and user-friendly interface that makes it easy for students to navigate and find the information they need.

Keywords: Artificial intelligence, Chatbot, RNN

Introduction

The College Enquiry Chatbot using RNN (Recurrent Neural Network) is an advanced conversational system that uses neural network architecture to simulate human-like interactions with students. The chatbot is designed to assist students in their college search process by providing accurate and personalized responses to their queries.

RNNs are a type of neural network that is particularly well-suited for processing sequential data, such as natural language inputs and outputs. The architecture of an RNN allows it to persist information across multiple time steps, which is particularly useful for conversational systems that need to maintain context over the course of a dialogue.

The College Enquiry Chatbot using RNN uses a database of frequently asked questions and answers to provide instant responses to the user's queries. The RNN architecture of the chatbot enables it to learn from previous interactions and improve its responses over time. This means that the chatbot can provide more accurate and personalized responses based on the user's past interactions with the system.

The chatbot is accessible through various platforms such as websites, mobile apps, or social media channels. It provides an intuitive and user-friendly interface that makes it easy for students to navigate and find the information they need. The RNN-based chatbot can handle context-specific queries and provide personalized

responses based on the user's profile and preferences.

Overall, the College Enquiry Chatbot using RNN is an advanced conversational system that leverages the power of neural network architecture to provide accurate and personalized responses to students. RNNs enable the chatbot to handle complex queries and maintain context over the course of a conversation, making it an indispensable resource for students in their college search process.

RNN METHODOLOGY

The first phase of research begins with the identification of problems and the study of literature. We identify that the issue discussed in this study is about using deep learning to categorize an intentional conversation of textual chat. Then we conducted literature studies in various related publications. From this literature, the author obtained an appropriate model for this research. From the first stage, it proceeds data cleaning and preparation stage. At this stage, it processes data that is taken from data sources. The data source is a university guest book available from the website, containing various visitors' comments. The scrapping technique took various kinds of comments on the website. From the results of scrapping, the authors then process the results obtained to be given data categories. The number of instances in the training set that are comment data from visitors and website managers is 120 data consisting of 5 types of categories, namely administration, lecturing, admission, registration, and comment. The five categories mean that there are data that have the intention of discussing administration,

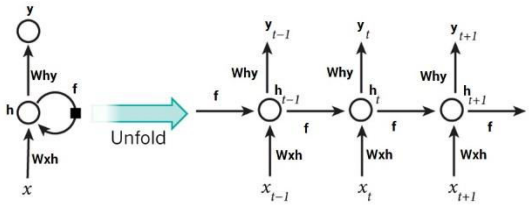
The next process is tokenization. The tokenization process is carried out to separate data into tokens. Each token has its index. The tokenization process changes all existing data into tokens. Here is an example of one data.

"halo min apakah ada alternatif lain saat upload bukti bayar via fax karna sulit nemuin fax sini"

"halo" "min" "apakah" "ada" "alternatif" "lain" "saat" "upload" "bukti" "bayar" "via" "fax" "karna" "sulit" "nemuin" "fax" "sini"

1: "halo", 2: "min", 3: "apakah", 4: "ada", 5: "alternatif", 6: "lain", 7: "saat", 8: "upload", 9: "bukti", 10: "bayaf", 11: "via", 12: "fax", 13: "karna", 14: "sulit", 15: "nemuin", 16: "fax", 17: "sini"

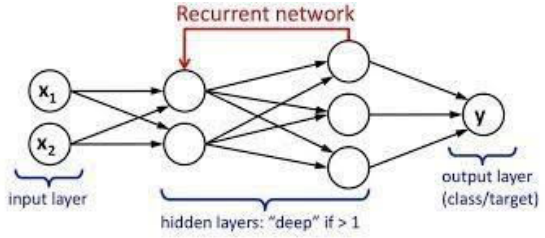
The next process is to convert data in the form of sentences into numerical data. This process is known as encoding. Each data is converted into a numeric code based on the token that has been created, and the numeric code is sequential in the order of the sentence.



"halo min apakah ada alternatif lain saat upload bukti bayar via fax karna sulit nemuin fax sini"

[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17] Furthermore, the data were validated by technique k fold cross-validation. K-Fold Cross-Validation (KFCV) is a model validation technique. The data set D is randomly divided into k sub-stores, which are usually called folds where the data in this subset are independent of each other consisting of f1, f2, ..., fk so that for each fold, the data is 1/k. Data divided can be used (k-2) fold into training data, one fold for validation, and the other for test data. For example, for fork = 5, the D1 data set consisting of three folds contains f1, f2, and f3, which are training data, and for f4, it is validation data while f5 is the test data. The data set D2 consists of f1, f2, and f4

for training data, f3 for validation data, and fs for test data. D3 data consists of f1, f3, and f4 for training data, f2 for validation data, and f5 for test data. D5 data consists of f2, f3, and f 4 for training data, f1 for validation data, and f5 for test data. F5 is deliberately used as test data to obtain four deep learning models with one fixed test data. This study uses k = 5. So in each data set, there are 480 training data and 120 test data. From the four models, you can choose the most optimal model. In addition, the training and test data can be varied. The training data is then processed using the RNN model. The RNN model that has been trained is then tested to see the model's performance. The model is also validated by measuring the performance, where in this study, the measurements used accuracy. Recurrent Neural Network, or what is commonly called RNN, consists of a few layers with repetitions. This model is suitable for sequence data, data in the form of rows or rows, historical data based on periods, text in the form of word sequences, letters, sub-words, sentences, sounds in the form of frequency, amplitude, and video, which consists of a sequence of images which are commonly called sequences of image frames. With these few layers, RNN is categorized as deep learning because of the loop in the process



In deep learning algorithms, sequential data is processed by storing information in the algorithm at a certain time. The information stored in the algorithm will be used again at a later time. So the RNN architecture added neuron connections that loop to the neuron earlier. This connection functions to store information from one time to another where the information is used repeatedly. The architecture can be seen, as shown in figure 2 [6]. Suppose we want to process the data x in the time segment t, symbolized in the image above as xt. The xt data is then processed by neuron A to produce ht output. The processing results carried out by neuron A will then be stored in a loop connection, which will then be used for data processing x at time t + 1. This looping process can be done several times. The more loops, the more information is stored [6]. Each symbol has its respective function in the mathematical formulation represented by these symbols. It is the output of neurons at time t. The value of ht can be formulated as follows.ht = fw (ht-1, xt) (1) Where fw is the activation function for neuron h. The activation function is usually tanh or RelU. ht-1 is the calculation of h at the previous time. Hidden layer h has two weights, namely for ht-1 and xt. So, from the first formula, we get the whhht-i equation, which is the weight on the hidden layer t-1 to time t, then wxh, the weight for the input layer, and bh, which shows the bias value. Can be formulated as follows.

ht = tanh (whhht-i + wxhxt + bh) (2)

Then the equation for the output layer can be obtained as follows.

ot = fo (whoht + bo) (3)

The activation function for the output layer in the form of softmax or sigmoid, which is the hidden layer's weight to the output layer, and bo is the bias value

System Implementation

To create such a chatbot, we would need to train an RNN model on a large dataset of college-related conversations. The model would need to be trained to understand the different types of queries that students might have and provide appropriate responses

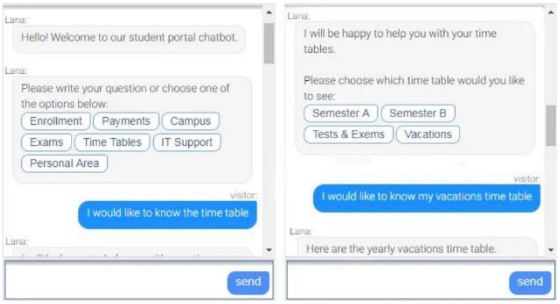
The system should be capable of running a python program and the Model is trained with some training data in order to give the accurate results

The training data for the model could come from various sources, including college websites, social media, and existing chatbots. The data would need to be preprocessed and labeled to ensure that the model can understand the context of the conversation

Case Study

The user Runs the chatbot application and waits for the program to load once the app starts running it asks for user queries and gives the most related output since we are dealing with a college database when the user asks a query in particular to college our chatbot redirects and gets the information from the official college website using web scraping and provide us accurate results

Also, the chatbot is capable of answering and learning general queries asked by the user the working of the RNN is done in the background and the results were displayed on the monitor



When the user asks for the history of the college the chatbot reads the history of the college provided in the database.

Conclusion

In conclusion, a college enquiry chatbot is an excellent tool for providing students with quick and easy access to information about the college. It can provide information on a wide range of topics such as admission requirements, course schedules, tuition fees, and campus facilities. Moreover, it can operate 24/7, which is a significant advantage for students who might have questions or concerns outside of regular business hours. Additionally, college enquiry chatbots can reduce the workload of staff members and increase efficiency. Overall, implementing a college enquiry chatbot is an excellent investment for colleges and universities to enhance student engagement and satisfaction.

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