Personal Project

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July 29, 2022

1 Statement of Data Mining Task

My task was to create a chatbot using python that analyzes patterns in user input to generate a response to commonly asked questions. The chatbot was designed to be an automated customer service representative for a business. It can answer questions such as "What is your name?" or "How old are you?" and "What are the hours of operation?" The biggest challenge was to make sure the user input could be interpreted by the chatbot correctly to offer a response that makes sense. To do this, I used the TensorFlow python library to simulate a small neural net that could make associations in the patterns to produce a response.

2 Methodology/Technical Approach

To solve this problem, the best approach was to use lists and the 'bagging method' to sort the data. Then I used the model of a simple neural net to analyze the patterns by making probabilities to generate an appropriate response. Unfortunately, I was not able to get the chat bot fully operational. The code runs just fine, libraries were imported correctly, and the version of python necessary is python 3.6.0, which I had running. However, I ran into a problem on line 79": model.load("model.tflearn") producing a ValueError: The passed savepath is not a valid checkpoint.

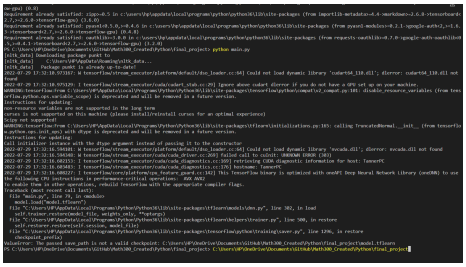

Figure 1: Screenshot of error message in terminal on VScode

I'm assuming the problem lies with how tensorflow is setup and with the path I was using in my file explorer in the editor.

3 Evaluation

When functioning correctly, the chat bot should be able to answer customer service-related questions about a made-up business. It gives its name and age (RoboNerd is its name) and will answer questions about what kind of product or service is sold and what the hours of operation are. If the chat bot fails to understand a question, it will default to "I didn't get that. Please try again." The chat bot remains in use until user types "quit" to exit the terminal. The chat bot is truly a simple machine intelligence, by using tensorflow to model a small neural net, making associations by analyzing patterns in the intents.json file, and then generating a response deemed appropriate to the user text.

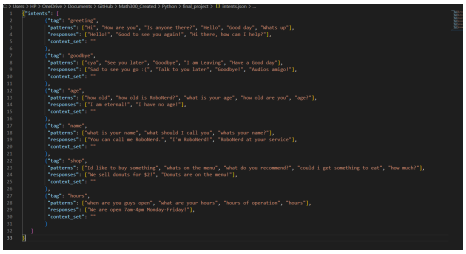

Figure 2: intents.json file, or lists of data the model reads in for training in patterns, and generates responses

The intents.json file acts as a kind of database file with tags indicating a type of phrase. For example, greeting would be something like: hi, how are you? Is anyone there? Etc. The tags act as groupings for types of questions and appropriate responses to said questions.

4 Chatbot Learning Algorithm

Illustration of chat bot algorithm that maps inputs to outputs then calculates percentages or likelihood of tags such as 'hello' or 'goodbye' using softmax activation function. All neurons are fully connected producing the nerual map.

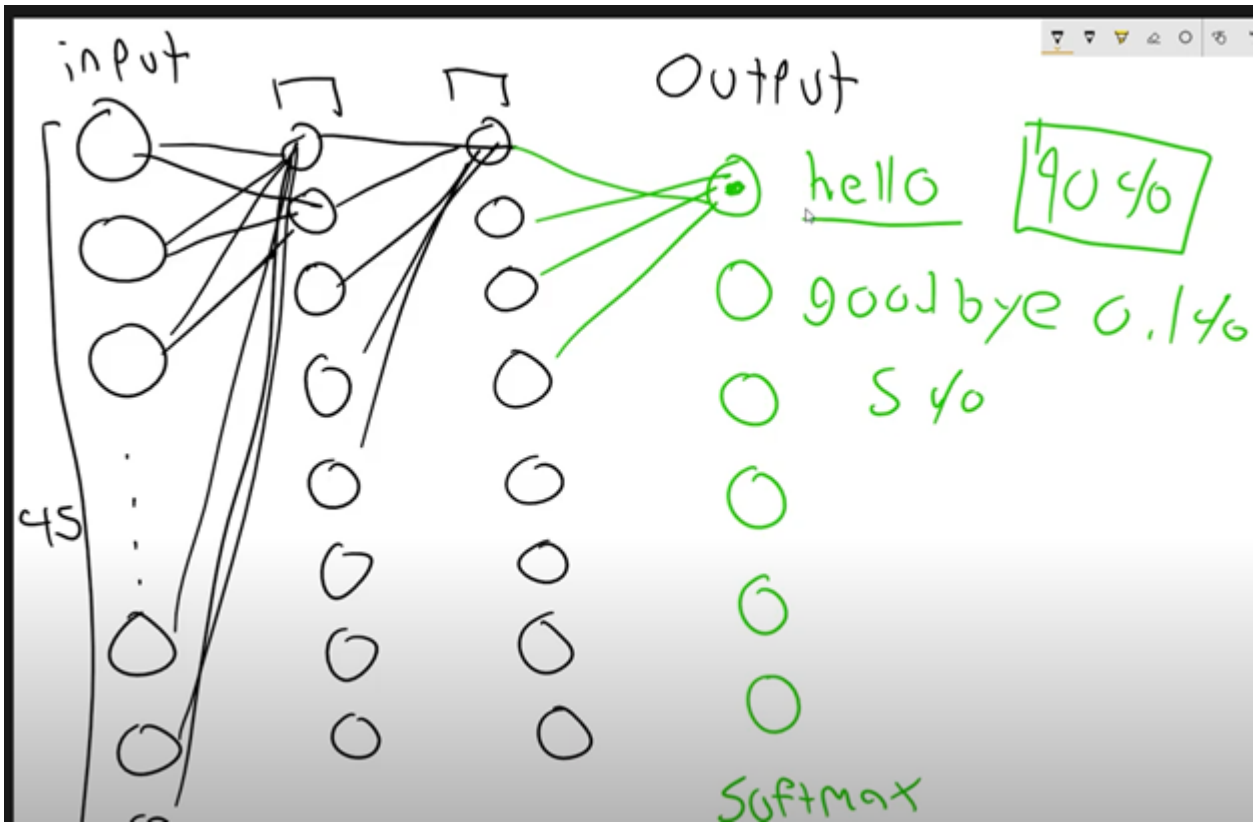

Figure 3: How it works demonstration