Comparison for Medical Chatbot Models

This documentation aims to compare two models used in a medical chatbot application. The first model employs a feedforward neural network with Stochastic Gradient Descent (SGD) optimizer, while the second model utilizes a Long Short-Term Memory (LSTM) architecture with the Adam optimizer. The comparison includes an analysis of accuracy and loss over 200 epochs and the performance of the chatbot in responding to user queries.

1. Accuracy and Loss Comparison:

1. **Model 1 (Feedforward Neural Network with SGD):**

Final Accuracy: 100% after 200 epochs

Final Loss: 0.0049

Training Time: Approximately 0.2 seconds per epoch

Training Method: Trained using SGD optimizer with specific parameters (learning rate, momentum, decay, nesterov)

2. **Model 2 (LSTM with Adam Optimizer):**

Final Accuracy: 37.31% after 200 epochs

Final Loss: 1.6623

Training Time: Approximately 1 second per epoch

Training Method: Trained using Adam optimizer with learning rate reduction on plateau.

Comparison:

3. Model 1 achieves significantly higher accuracy (100%) compared to Model 2 (37.31%) after 200 epochs.
4. Model 1 has lower loss (0.0049) compared to Model 2 (1.6623), indicating better convergence.
5. Model 1 has a shorter training time per epoch compared to Model 2.

2. Chatbot Prediction Comparison:

1. **Model 1 (Feedforward Neural Network with SGD):**

Performance: Responds accurately to user queries with relevant information about medical conditions, medications, and preventive measures.

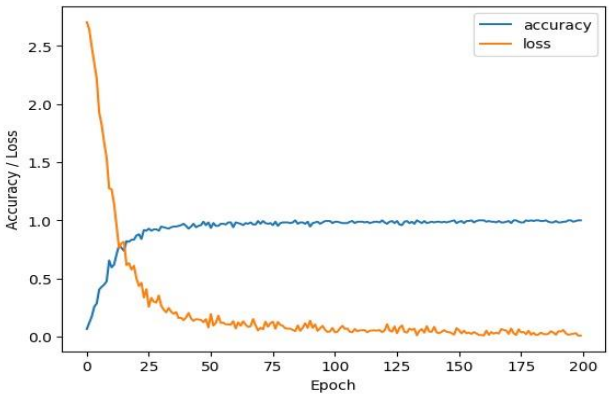
2. **Model 2 (LSTM with Adam Optimizer):**

Performance: Provides responses that are less accurate and relevant compared to Model 1. Often responds with default messages indicating a lack of understanding.

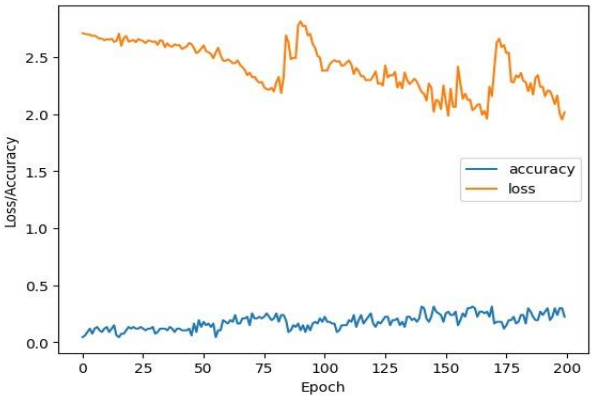
Comparison:

- Model 1 demonstrates superior performance in accurately responding to user queries compared to Model 2.
- Model 2 frequently returns default messages, suggesting potential limitations in understanding user intent.

Conclusion:



Model 1



Model 2

- While Model 1 achieves higher accuracy and lower loss during training, it also outperforms Model 2 in terms of chatbot prediction accuracy and relevance.
- Model 2, despite its lower accuracy and higher loss, struggles to provide relevant responses to user queries, indicating potential issues in capturing complex sequential patterns in text data.

In conclusion, for this medical chatbot application, Model 1 (Feedforward Neural Network with SGD) appears to be the more effective choice based on its superior accuracy and chatbot prediction performance.