

Final Report: Pizza OrderBot Lab

Overview

The purpose of this lab was to design, develop, and refine a chatbot capable of taking orders for a pizza restaurant. The chatbot was tasked with managing customer inputs, confirming details, providing accurate pricing, summarizing orders, and handling payment methods. Over the course of three iterative Orderbots, we implemented enhancements and addressed various issues to optimize the chatbot's functionality.

Findings

1. General Functionality:

- The chatbot successfully engaged with users conversationally, taking inputs and providing responses in a friendly tone.
- It handled various aspects of the ordering process, including taking orders, summarizing items, calculating totals, and confirming details.

2. Strengths:

- **Improved Summaries:** The chatbot now provides detailed breakdowns of orders, including individual item pricing and toppings.
- **Calculation Improvements:** While the bot accurately calculated most subtotals, specific adjustments were needed to ensure accuracy in multi-item orders.
- **Customizable Styling:** The dashboard improvements (color scheme, scrolling, and reverse order) created a more user-friendly interface.

3. Issues Observed:

- **Incorrect Pricing:** When ordering customized items like a large pizza with all available meats, the bot sometimes defaulted to a single base price without adding topping costs.
 - **Total Calculation Errors:** The bot occasionally produced inconsistent total amounts due to miscalculated subtotals or failure to apply certain charges (e.g., delivery fee or toppings).
 - **Repetition in Confirmation:** There were instances where the bot unnecessarily repeated confirmations or summaries, potentially confusing the user.
 - **Hallucinations:** The bot invented menu items such as a "Meat Lover's Pizza," which was not part of the predefined menu.
-

What I've Tried

- **Orderbot 1:** Focused on basic functionality, ensuring the bot could collect inputs, provide responses, and summarize the order. Improvements included reverse order display and color customization for the dashboard.
- **Orderbot 2:** Added automatic calculation of order totals and integration of delivery charges. While this improved efficiency, issues with subtotal accuracy and invented items were identified.
- **Orderbot 3:** Refined the prompt to enforce stricter adherence to the predefined menu, ensuring no hallucinated items were included. Despite this, occasional inconsistencies in pricing logic persisted.

Errors and Challenges

1. **Subtotal and Total Mismatches:** While itemized calculations worked in some cases, the final total occasionally did not reflect these subtotals accurately.
2. **Menu Adherence:** Despite clear instructions, the bot invented menu items and failed to consistently match item prices based on size or toppings.
3. **User Experience:** Repeated confirmations and errors in recalculating totals affected the user experience.

What I've Learned

1. **Prompt Engineering Matters:** The specificity of instructions in the system prompt significantly affects the bot's adherence to rules. Even slight ambiguities can lead to hallucinations or errors.
2. **Complex Calculations Require Testing:** Dynamic pricing logic, especially when handling multiple variables (e.g., size, toppings, and delivery), needs rigorous validation.
3. **Iterative Development Is Key:** Each Orderbot allowed us to identify new issues and refine functionality. Continuous testing and user feedback are crucial for improving chatbot performance.

Future Recommendations

1. **Enhanced Logic for Pricing and Toppings:**
 - Implement stricter validation mechanisms to ensure topping costs and size-based pricing are calculated accurately.
2. **Streamline User Interaction:**
 - Simplify confirmations to avoid unnecessary repetition while maintaining clarity.
3. **Scalability for Menus:**
 - Explore database integration for menu management, allowing for real-time updates and expanded options without modifying the code.
4. **Error Handling:**
 - Add fallback mechanisms to handle calculation or response errors gracefully.

This lab demonstrated the potential and limitations of chatbot development using OpenAI's models. While I achieved significant improvements, there is room for further optimization in handling complex order scenarios and enhancing user experience. Overall, this was a valuable learning experience in iterative design and prompt engineering.