

# **Brief Report**

## **1. Defined Intents and Rationale**

The primary intents were selected to cover common use cases for a chatbot, such as:

- a. **Weather:** Queries related to weather information.
- b. **Fun Fact:** For trivia, jokes, or interesting facts.
- c. **Reservation:** Handles booking and reservation requests.
- d. **Customer Support:** Queries related to assistance or support.

These intents were chosen based on typical customer needs in common customer service and information domains.

## **2. Algorithm Choice**

A Naive Bayes classifier was chosen due to its simplicity and efficiency for text classification tasks. Naive Bayes is particularly suitable for small datasets and text-based data, where it generally performs well without requiring extensive computational resources.

## **3. Performance Metrics**

The model's performance was assessed using **accuracy** and a **classification report** (including precision, recall, and F1-score). The sample accuracy score indicated a reasonable starting point, though precision and recall vary per intent based on data distribution and complexity.

## **4. Challenges and Solutions**

- a. **Data Scarcity:** With limited data, achieving high accuracy for all intents was challenging. This was managed by using TF-IDF to better capture word relevance and context, improving feature representation.
- b. **Imbalanced Data:** Some intents had fewer samples, which can skew predictions. Adjustments in data collection were made, adding more examples to the underrepresented intents to balance the dataset.

- c. **Model Overfitting:** By testing with multiple algorithms and adjusting vectorization parameters, the model's generalization improved, reducing overfitting risk.

This report provides a straightforward foundation for a basic intent classification model. For more advanced needs, consider exploring deep learning models such as LSTM or BERT for further enhancement in accuracy.