**NLU Task Documentation**

**1. Data Acquisition:**

**Description:** This section outlines obtaining the dataset for training and testing the Natural Language Understanding (NLU) models.

**Steps:**

* Obtain a dataset containing user utterances within a specific domain and corresponding intents and entities.
* Verify if the dataset includes conversations between users and a chatbot.

**2. Intent Recognition:**

**Description:** Develop a model to classify user inputs into predefined intents.

**Approach:**

* Utilise appropriate features such as TF-IDF, word embeddings, or contextual embeddings like BERT.

**3. Entity Extraction:**

**Description:** Build a model to extract named entities from user inputs.

**Approach:**

* Use techniques such as Named Entity Recognition (NER) to identify relevant entities within the text.

**4. Slot Filling and Context Handling:**

**Description:** Implement mechanisms for slot filling and contextual understanding.

**Approach:**

* Fill slots based on extracted entities and recognized intent.
* Maintain conversation state and context across multiple user inputs.

**5. Dialog Management:**

**Description:** Create a system for generating appropriate responses based on recognized intent and extracted entities.

**Approach:**

* Develop a rule-based or machine learning-based dialog management system.
* Ensure the system handles multiple turns in a conversation while maintaining context.

**6. Model Evaluation:**

**Description:** Evaluate the performance of intent recognition and entity extraction models.

**Metrics:**

* Accuracy, precision, recall, and F1 score.

**Evaluation:**

* Test the complete NLU module in a simulated dialogue scenario.

**7. Iterative Improvement:**

**Description:** Continuously improve the NLU module based on evaluation results.

**Approach:**

* Adjust models or dialogue management approach.
* Experiment with different techniques to enhance system capabilities.