

## **Assignment: Developing a Bangla Chat Bot with Neural Networks**

### **Objective:**

Develop a Bangla Chat Bot capable of natural language understanding and generation in the Bengali language, leveraging neural networks for improved performance.

### **Project Overview:**

In this assignment, you will create a Bangla Chat Bot that utilizes neural networks to enhance its language understanding and generation abilities. The chat bot should be able to understand user input, respond contextually, and provide relevant information.

### **Target Goals:**

To successfully complete this assignment, you must achieve the following goals:

#### **Natural Language Understanding (NLU):**

Goal: Implement NLU using neural networks to comprehend user input in Bengali.

Target: Achieve a minimum accuracy rate of 90% in correctly understanding and processing user text input.

#### **Contextual Conversation:**

Goal: Ensure the chat bot maintains context throughout a conversation using recurrent neural networks (RNN) or transformers.

Target: The chat bot should be able to correctly respond to context-related questions in at least **90%** of interactions.

#### **Predefined Responses:**

Goal: Utilize neural networks for generating predefined responses for common queries, greetings, and polite interactions.

Target: Implement responses for at least 20 common Bengali conversational scenarios using neural language generation models.

#### **Language Support:**

Goal: Enhance language support using neural networks to understand various dialects and variations.

Target: The chat bot should be able to understand and generate text in standard Bengali as well as at least three major dialects using neural models.

#### **Multimodal Input (Optional):**

Goal: Implement neural networks for processing text, voice, and image inputs (optional).

Target: If implementing voice and image input, achieve at least 80% accuracy in voice recognition and image processing using neural models (optional).

**Goal:** Implement neural-based machine learning to improve the chat bot's responses over time (optional).

**Target:** Develop a learning algorithm that shows a measurable improvement in response quality after a period of usage using neural network-based techniques (optional).

**Multilingual Support (Optional):**

**Goal:** Enhance multilingual support using neural networks for language-switching functionality (optional).

**Target:** Implement language-switching functionality for at least four languages using neural-based language translation models (optional).

**Deliverables:**

To fulfill this assignment, you must provide the following:

**Codebase:** A well-documented codebase for the Bangla Chat Bot, incorporating neural network models where applicable.

**Documentation:** Comprehensive documentation that includes installation guides, usage instructions, and FAQs for both developers and users.

**Testing Report:** A report detailing the testing process, including test cases, results, and any bug fixes or improvements.

**Presentation:** Prepare a presentation summarizing the project, goals achieved, challenges faced, and the impact of neural networks on performance.

**Timeline:**

The assignment should be completed before final, with weekly progress updates.

**Evaluation:**

You will be evaluated based on the achievement of target goals, effective utilization of neural networks, code quality, documentation completeness, and presentation quality.

**Note:** Ensure compliance with legal and ethical considerations regarding user privacy and data protection throughout the development process, especially when using neural networks for user interactions.