Model Development Phase

Date	7 February 2026
Team ID	LTVIP2026TMIDS66217
Project Title	TransLingua – AI-Powered Multi-Language Translator
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

In the TransLingua project, a **pre-trained large language model (Gemini Pro)** is utilized for multilingual translation. Since the model is already trained on large-scale multilingual corpora, **no custom model training is performed**. Instead, the focus is on **model initialization, prompt engineering, validation, and performance evaluation** during real-time inference.**Initial Model**

Training Code:

```
import google.generativeai as genai

# Configure Gemini Pro API
genai.configure(api_key=API_KEY)

# Initialize pre-trained Gemini Pro model
model = genai.GenerativeModel("gemini-1.5-flash")

# Translation function
def translate_text(text, source_language, target_language):
    prompt = f"Translate the following text from {source_language} to {target_language}: {text}"
    response = model.generate_content(prompt)
    return response.text
```

Model Validation and Evaluation Report:

Since TransLingua is an inference-based system, evaluation is performed using qualitative and functional validation metrics rather than traditional accuracy-based metrics.

Evaluation Criteria

Metric	Description
Translation Accuracy	Assessed by comparing translated output with known correct translations
Context Preservation	Evaluates whether the meaning and tone are retained
Response Time	Measures time taken to generate translation
Language Coverage	Verifies correct handling of multiple languages
Error Handling	Validates system behavior for empty or invalid input

Model Evaluation Summary

Evaluation Aspect	Result
Translation Quality	High
Context Awareness	High
Response Time	Low latency
Multilingual Support	Successful
Overall Performance	Satisfactory

Validation Approach

Validation Method	Description
Manual Validation	Sample multilingual text inputs are manually translated and compared with expected outputs to verify translation accuracy and contextual correctness.
Input Length Testing	The system is tested using short, medium, and long input sentences to evaluate consistency and performance across varying text lengths.
Language Combination Testing	Multiple source and target language combinations are tested to ensure reliable multilingual support and correct language conversion.
UI-Level Validation	Input validation is performed at the user interface level to handle empty inputs, invalid selections, and error scenarios gracefully.