

Project Proposal: An AI Tool to Convert Bengali Math Problems into Mathematical Equations

Project Overview:

“MathBangla” is an innovative AI-powered tool designed to understand and convert Bengali-language mathematical word problems into structured mathematical equations. It leverages Natural Language Processing (NLP) and mathematical logic to interpret Bengali sentences—ranging from simple arithmetic to multi-variable algebraic word problems—and transform them into equations that can be solved or further analyzed. This tool aims to help students, educators, and educational platforms by automating the most error-prone part of solving math problems: converting words into equations.

Problem Statement:

Most Bengali-speaking students struggle to translate word-based math problems into proper algebraic equations. While there are English-based tools that partially solve this, no intelligent tool currently exists for the Bengali language that can understand complex mathematical logic and generate structured expressions. This language gap causes confusion, slows down learning, and limits access to digital education tools.

Objectives:

- Automatically extract quantities, relationships, and question goals from Bengali text.
- Convert Bengali math problems into accurate algebraic expressions or systems of equations.
- Handle a variety of problem types: arithmetic, ratio/proportion, unit value, linear equations, etc.
- Offer a clean, distraction-free output: only the mathematical expressions.



Example Use Cases:

Input (Bengali): ৫টি আমের দাম ৫x টাকা। তাহলে ১৫টি আমের দাম কত?

AI Output: $(5x / 5) * 15$ or simply $15x$

Input (Bengali): একটি খামারে কিছু মুরগি ও গরু আছে। মোট পা ৭০টি এবং মোট প্রাণীর সংখ্যা ২০। মুরগির ২টি ও গরুর ৪টি করে পা আছে।

AI Output: $x + y = 20$ $2x + 4y = 70$

Key Features:

Bengali NLP Understanding: Tokenization, part-of-speech tagging, and meaning extraction in Bengali.

Math Pattern Extraction: Detects and understands quantities, relationships (sum, product, division), and logical flows.

Equation Generation Engine: Converts the interpreted data into algebraic equations with defined variables.

Clean & Direct Output: Only outputs the necessary mathematical expressions—no extra text or noise.

Conclusion:

MathBangla is not just a translation tool—it's a math reasoning assistant built specifically for Bengali learners. It combines AI, NLP, and algebraic logic to create a powerful educational aid that can reduce barriers in STEM learning for millions of Bengali-speaking students.

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