Smart Multiplication AI Game

🧠 Project Overview: Learning Multiplication Through AI Pattern Recognition

The **Smart Multiplication AI Game** is a unique educational tool designed to demonstrate the core principles of **Machine Learning (ML)** and **Pattern Recognition** using a familiar concept: multiplication.

This application is **NOT a calculator**. It uses a simple ML algorithm (Polynomial Regression) to observe pairs of input numbers (X, Y) and their corresponding result, then attempts to find the underlying mathematical pattern (the "multiplication rule") from the provided examples. It mimics how a brilliant child, without formal math knowledge, could discover rules through observation and pattern matching.

🚀 Getting Started (Run the Game)

Since this application was packaged with **PyInstaller**, you do **not** need to install Python or any dependencies to run the game.

⬇️ Download & Run (Windows)

1. **Download:** Get the `AIMultiplicationGame.exe` file directly from the main directory of this repository.
2. **Run:** Double-click the executable file to start the game immediately.

💡 How the AI Works (Simple Explanation)

The application models the multiplication task as a **three-dimensional curve-fitting problem**:

1. **Training Phase:** You input examples (e.g., `2 x 3 = 6`). The AI sees this as a data point `(X, Y, Result)`.
2. **Pattern Recognition:** The **Polynomial Regression** algorithm finds a smooth curve (a polynomial function) that passes as close as possible to **all** the training data points.
3. **Prediction:** When you ask for a new prediction (`A x B = ?`), the AI plugs `A` and `B` into the learned function and outputs the value of the function at that point.
4. **Key Insight:** The more **varied** examples you provide in the Training Mode, the closer the learned pattern gets to the true multiplication function, and the lower the prediction error becomes! The AI learns to predict the result based on patterns—it **does NOT compute multiplication mathematically.**

💻 Technical Info

Component	Technology / Library	Note
Written In	Python	The core programming language.
User Interface	KivyMD (Material Design)	Cross-platform UI framework.
Executable Build	**PyInstaller**	Bundled the Python interpreter and all libraries into the standalone `.exe`.
Core Algorithm	Polynomial Regression (using NumPy)	The specific ML method used for pattern recognition.

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👥 Development Team

Role	Name	Contact / Profile
Primary Developer	Saba Haidari	LinkedIn Profile
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For more Information, please see the Saba's GitHub: https://github.com/sabaLAB-dev/AI_Game

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📊 Version Info

- **Version:** 1.0.0
- **Release Date:** September 2025