# Generative AI-Driven Hyper-Personalization

## Problem Statement

Modern customers expect highly personalized experiences that cater to their unique preferences. This project aims to develop a Generative AI-driven solution that enhances hyper-personalization by analyzing customer profiles, social media activity, purchase history, sentiment data, and demographic details. The goal is to generate personalized recommendations for products, services, or content, while also providing actionable insights for businesses to optimize customer engagement.

## Solution Overview

The solution is built using a .NET 8 backend and a React frontend. It leverages AI-based recommendations, real-time adaptive learning, and reinforcement feedback mechanisms. Key features include:

* - Hybrid filtering (collaborative + content-based) for recommendations.
* - Multi-arm bandit approach for dynamic traffic allocation.
* - Sentiment analysis using NLP for feedback quality improvement.
* - Real-time self-correcting system based on reinforcement learning.

## Technical Implementation

The backend is developed using .NET 8 with API endpoints exposed for the React frontend. A JSON-based data model is used to store and retrieve AI-generated recommendations. The AI logic utilizes a hybrid recommendation engine and reinforcement learning techniques.

## How to Run the Project

1. Clone the repository from GitHub.

2. Open the backend project in Visual Studio or VS Code and run `dotnet run`.

3. Navigate to the frontend folder and start the React application using `npm start`.

4. Access the application in a web browser at `http://localhost:3000`.

## Conclusion

This project provides an advanced AI-powered hyper-personalization solution. It enhances user engagement by offering intelligent, data-driven recommendations, ensuring businesses can optimize customer experiences efficiently.