MPS DATA606 Project Proposal

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Project Title
Generative AI Platform for Interpretable Analysis and Synthetic Simulation of Public Government Credit Card Transactions

Problem Statement
Government agencies and researchers struggle to analyze large raw credit card transaction datasets to uncover spending shifts and evaluate policy impacts. Aggregated summaries limit the granularity needed for detailed insights. This project aims to provide interpretable reports and synthetic transaction simulations from raw data, enhancing transparency and enabling scenario analysis.

Innovation/Original Contribution
This project uniquely applies generative AI to raw government credit card data to produce human-readable behavior explanations and realistic synthetic transactions. Unlike existing tools or ChatGPT, it will integrate diverse data sources and generate interactive, scenario-driven insights reflecting real policy and consumer behavior, while preserving data privacy.

Proposed Approach/Methodology/Data Collection
We will collect raw transaction data from public sources like GSA SmartPay and CFPB inventories. Using Python and deep learning frameworks, we will develop generative models for narrative generation and synthetic data creation. FRED economic data may supplement the analysis for context.

Expected Outcomes & Deliverables
Deliverables include a functional prototype demonstrating generative explanations and synthetic data, a technical report describing methods and findings, and a final presentation.

Feasibility & Timeline
The project scope covers data preparation, model training, integration, and evaluation. Milestones include data acquisition (Weeks 3-5), model development (Weeks 5-8), system integration (Weeks 8-10), and final reporting (Weeks 10-11).

One Anticipated Challenge
Ensuring synthetic data realism while protecting privacy is the key challenge, addressed through extensive testing, privacy-preserving techniques, and expert consultation.