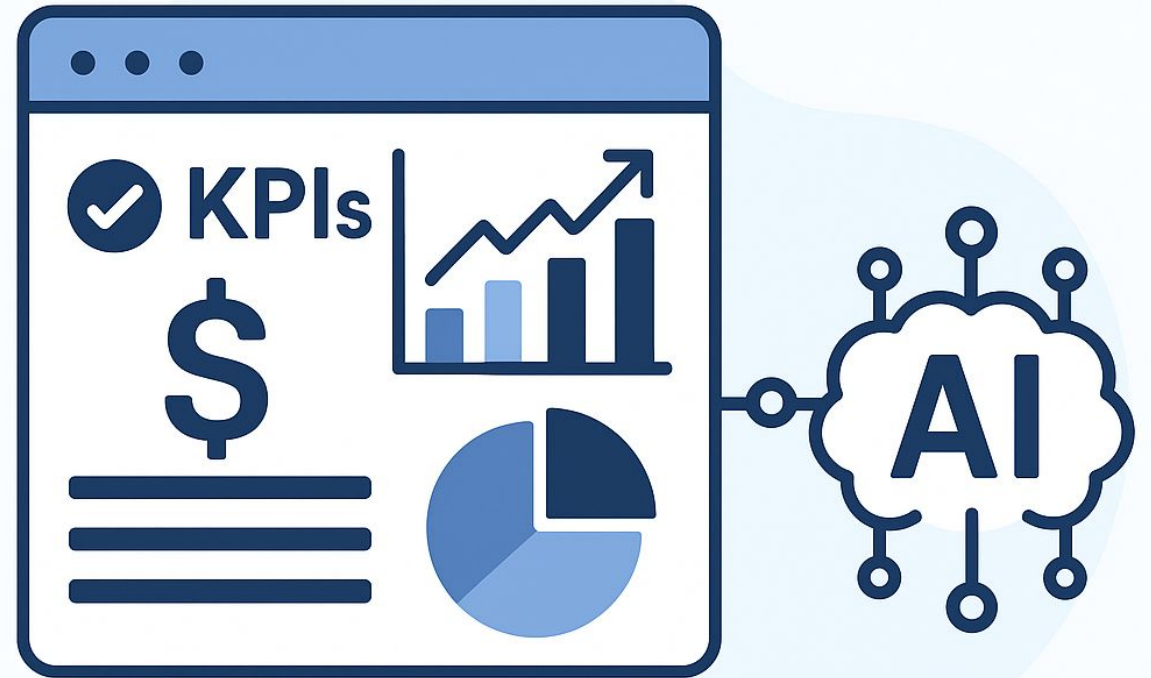


Agentic Financial Workflow Using AWS Bedrock

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Introduction & Dataset Overview

Project Goal:

- Automate financial insights using an agentic AI workflow powered by AWS Bedrock
- Our workflow processes raw transactions → categorizes them → computes KPIs → produces a summary → and evaluates errors through reflection

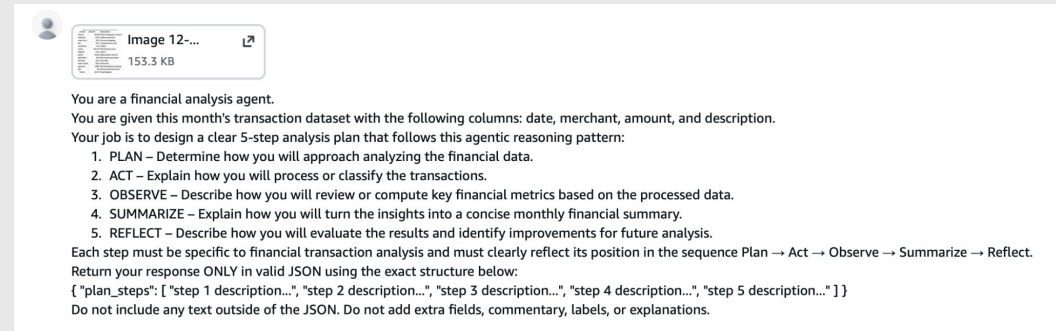
Dataset Overview:

- File: transactions.csv
- Personal Finance Data
- Columns: date, merchant, amount, description
- Represents realistic monthly spending and income

	date	merchant	amount	description
1				
2	10/1/2024	Amazon	45.99	Online shopping - household items
3	10/1/2024	Starbucks	8.25	Coffee and snack
4	10/2/2024	Trader Joe's	76.4	Grocery shopping
5	10/2/2024	Uber	22.5	Transportation ride
6	10/3/2024	Blue Bottle	6.5	Coffee
7	10/3/2024	Costco	185.75	Monthly groceries

Agentic Workflow: The 5 Stages

- PLAN: Model creates a 5-step plan to analyze transactions
- ACT (Categorization): Each transaction assigned to one category
Shopping, Dining, Utilities, Income, Other
- OBSERVE (KPIs): Compute financial metrics such as total spend, income, top merchants, and averages
- SUMMARIZE: Model generates a ≤100-word narrative summary of the month.
- REFLECT: Model reviews for errors, misclassifications, KPI mistakes, and improvements.



```
{  
  "plan_steps": [  
    "Organize transactions by category (e.g., groceries, utilities, income) and calculate total income and expenses",  
    "Create a cash flow statement by subtracting total expenses from total income",  
    "Calculate key financial ratios such as savings rate, debt-to-income ratio, and discretionary spending percentage",  
    "Generate a concise report highlighting total income, expenses, savings, and top spending categories",  
    "Identify spending patterns, potential areas for budget optimization, and set financial goals for the next month"  
  ]  
}
```

FinTech Relevance

- Small businesses use similar pipelines to automate bookkeeping and expense tracking.
- Categorization + KPIs provide insights into cash flow, spending habits, and vendor costs.
- Structured JSON outputs resemble the internal logic of tools like QuickBooks, Mint, and Wave.
- Reflection mirrors real auditing loops where systems self-correct classification errors.
- Visual KPI charts replicate the dashboards used by personal finance apps.



Lessons Learned

Challenges Faced

- Several category misclassifications (e.g., Uber and Shell Gas → Transportation)
- Spotify labeled as Other due to missing “Subscriptions” category
- Top merchants list incorrect at first (AT&T mistakenly replaced by Whole Foods)
- Needed stricter JSON-only prompting and explicit sorting instructions

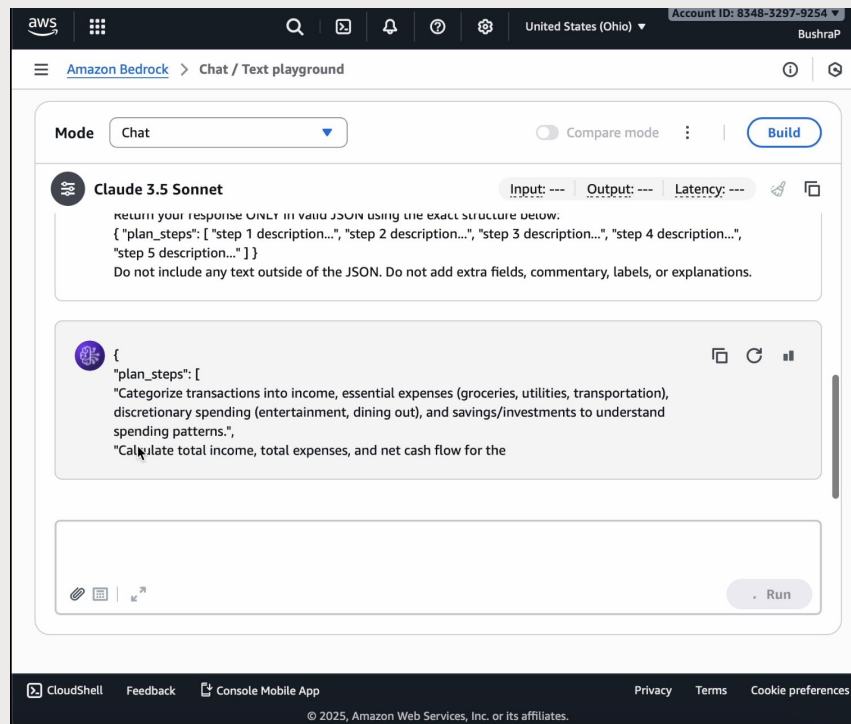
Improvements Implemented

- Strengthened prompts with explicit schemas (“ONLY return JSON”)
- Manually validated KPI totals and merchant rankings
- Added guidelines for category rules in future iterations
- Created optional KPI visualizations for clearer insights

Team Participation

- Bushra: Prompt engineering, model iteration, JSON cleanup.
- Abdul: Data generation, CSV creation, pipeline setup.
- Mishar: KPI validation, financial insight checks, summary + reflection refinement.

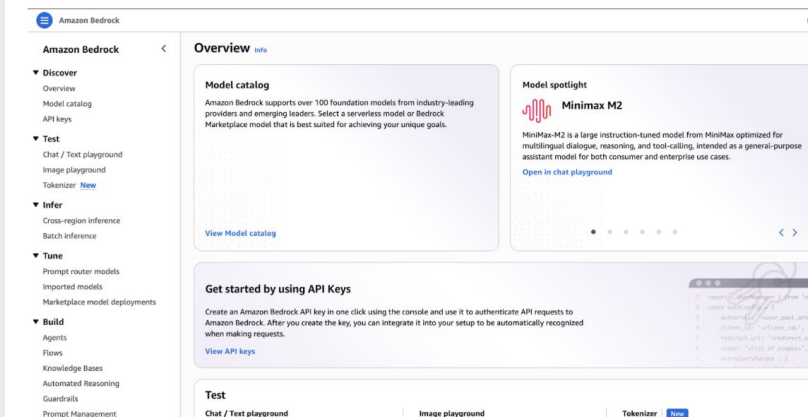
Demonstration Video



Prompt Demonstration

Prompting process

Step 1: After logging into AWS Bedrock, go to Chat/ Text Playground under Text option



ISE 391 Prompts doc