Three applications that use database systems to store and manage data

- **University Information System**

A university system stores and manages academic and administrative data. Such as student records, course information, enrollments, and grades. It allows students to register for classes and faculty to submit grades while maintaining data integrity.

- **Banking System**

A banking application relies on a database system to manage financial data securely. Such as customer information, account balances, and transaction records. It uses database transactions to ensure secure and accurate money transfers.

- **E-commerce System**

Online shopping platforms use database systems to manage products and customer transactions. So it stores product information, customer accounts, orders, and inventory data. It supports multiple users at the same time and ensures that inventory and payments are processed correctly.

Three domain project applications with purpose, functions, and simple interface design.

- Criminology

The purpose of this application is to help law enforcement agencies and researchers analyze crime patterns and identify high risk areas. It's function, store and manage crime incident records (location, time, type of crime), identify crime hotspots and generate statistical reports. A Simple Interface Design, dashboard displaying summary statistics and crime trends and a report section to download charts and summaries.

- Economics

The purpose of this application is to analyze income and spending behavior to help individuals and researchers understand financial decision patterns. It's function Store income and transaction data, categorize expenses (e.g., housing, food, transportation) and track spending over time. A Simple Interface Design, a home dashboard showing total income, expenses, and savings and a budgeting tool to set financial goals.

- Brain Science

The purpose of this application is to monitor and analyze cognitive performance over time for research and personal development. It's function store results from memory and attention tests, and Compare results across sessions. A Simple Interface Design, a user profile page showing performance history and   progress dashboard with visual graphs

Data mining is needed

Data mining is needed because efficient retrieval does not automatically produce useful knowledge. While a database can answer questions like "What were last month's sales?" t cannot by itself identify patterns such as customer purchasing trends. Thus, data mining is necessary to transform raw data into **useful knowledge**, uncover hidden patterns, support predictive analysis, and generate new scientific insights.

NoSQL systems emerged in the 2000s

NoSQL systems emerged in the 2000s primarily due to the rapid growth of web applications, social media platforms, and large-scale internet services that generated massive amounts of unstructured data. While the traditional relational database systems were designed for structured data, so NoSQL systems emerged to address the limitations of traditional relational databases in handling big and diverse data, especially in modern web.