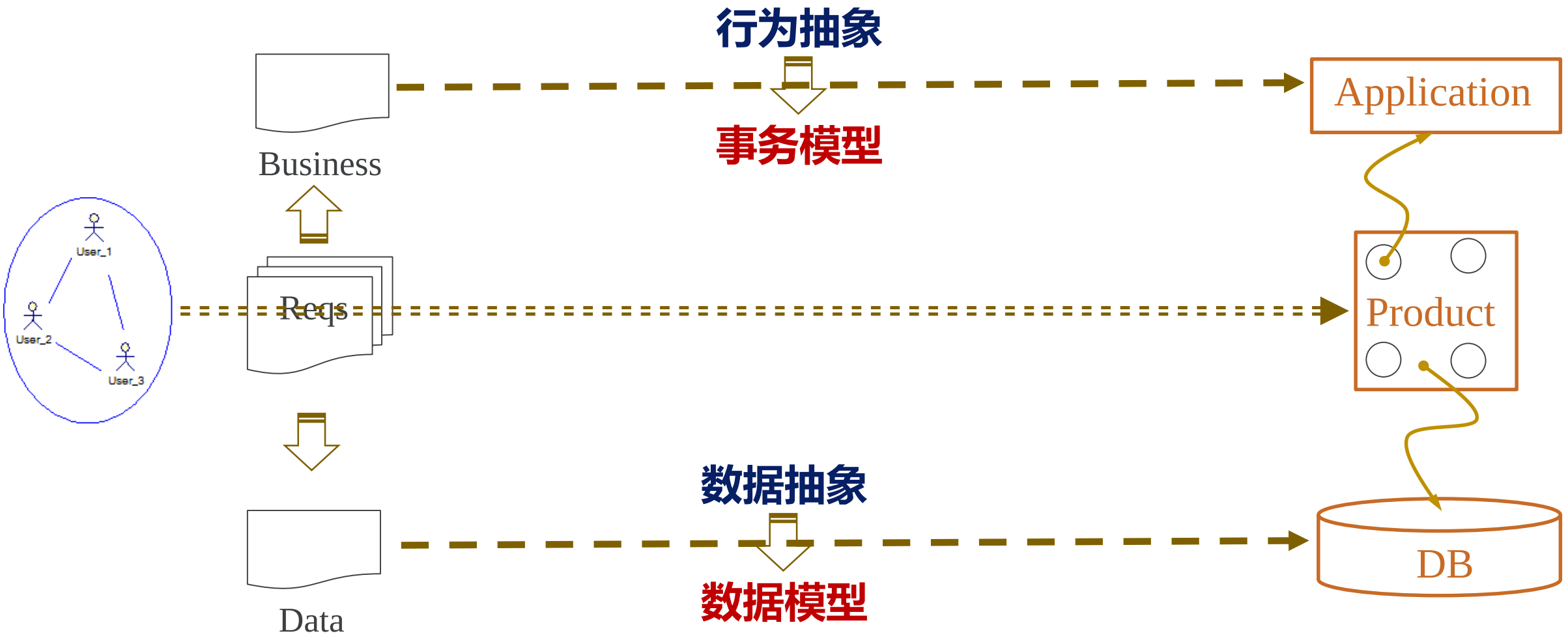
事务模型

讲解人：陆伟 教授

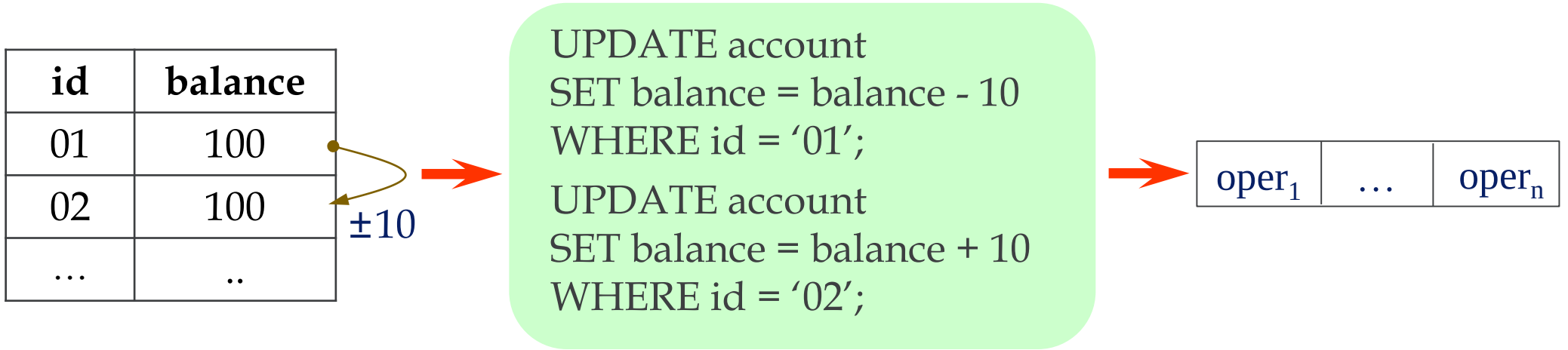
数据库中两个核心的概念



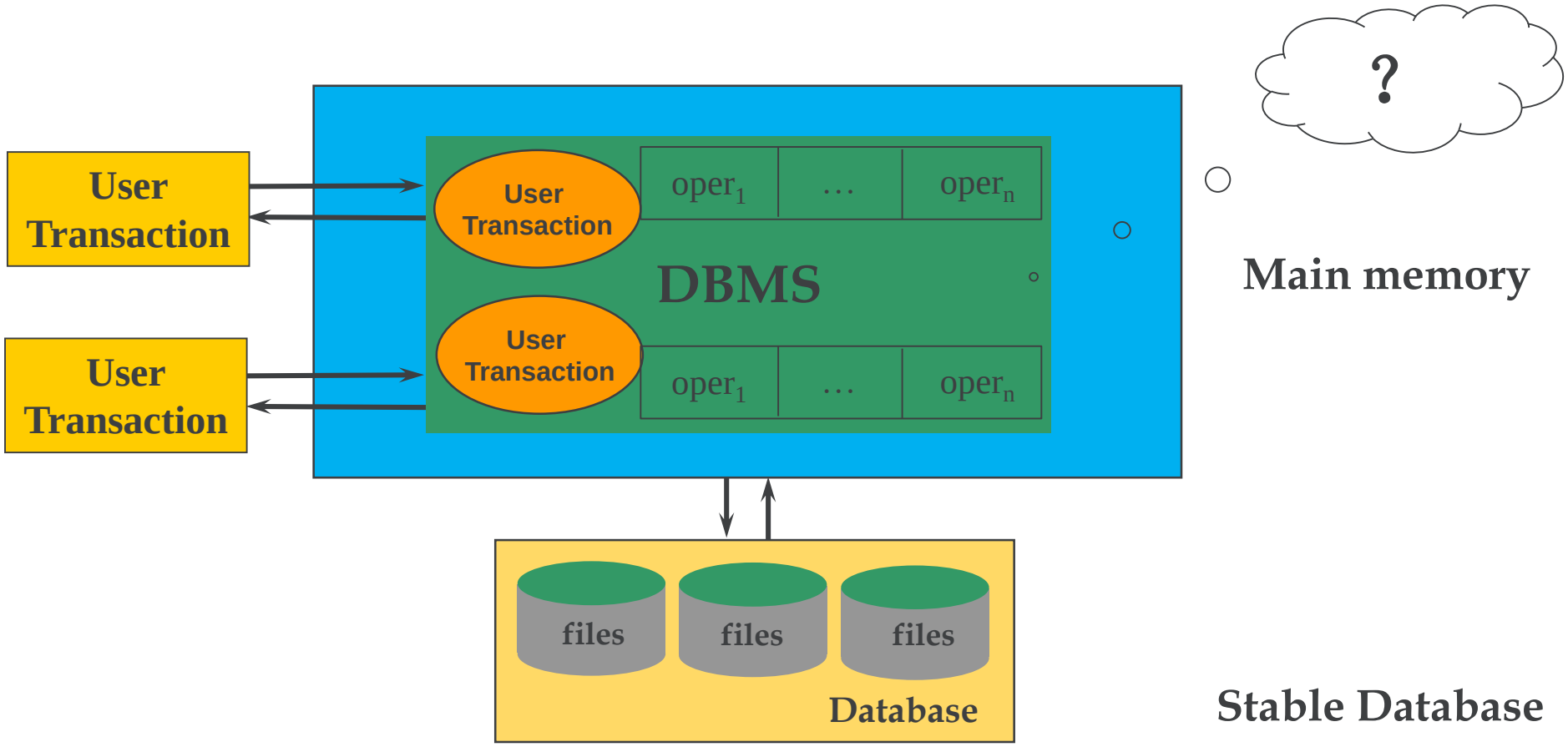
事务的概念

事务的定义

- A transaction is the execution of a program segment that performs some function or task by accessing a shared database.
- An action, or series of actions, carried out by a single user or application program, which reads or updates the contents of the database.
- A transaction is a logical unit of work on the database.



事务的执行环境与潜在风险

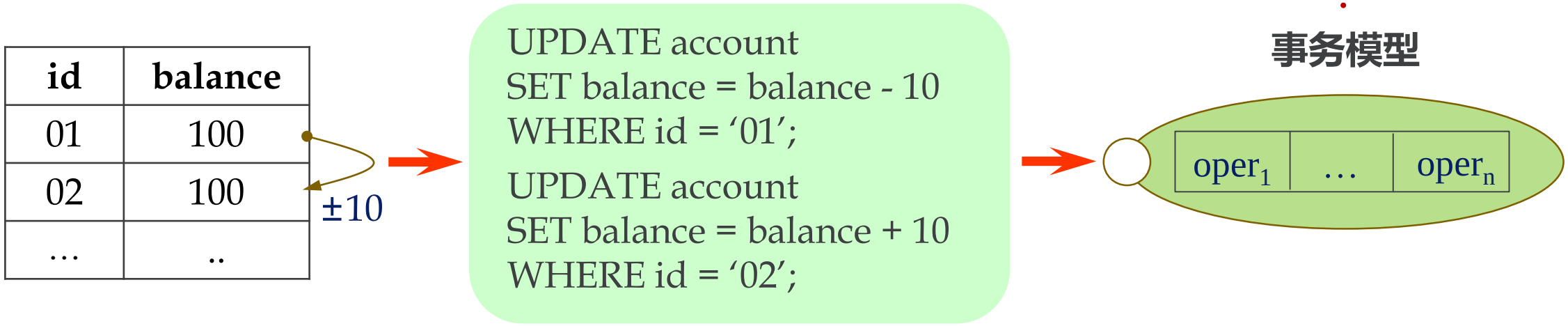


讨论：事务执行环境对单个事务执行可能带来的风险?

事务执行环境对多个事务并发执行可能带来的风险?

DBMS对事务的支持—事务模型

- DBMS support transaction model to provide application programmers with a high-level execution interface that hides both the effects of concurrency among the different transactions, and the presence of failures.
- In this way, programmers are relieved from dealing with the complexity of concurrent programming and failures. They need only to focus on designing the business and application logic, and developing correct individual transactions.



事务的ACID特性

- Atomicity(原子性) → **恢复协议**
  - Atomicity requires that either "all or none" of the transaction's operations be performed.
- Consistency(一致性) → **完整性约束、触发器等机制**
  - Consistency requires that a transaction maintain the integrity constraints on the database.
- Isolation(隔离性) → **并发控制协议**
  - Isolation requires that a transaction execute without any interference from other concurrent transactions.
- Durability(持久性) → **恢复协议**
  - Durability requires that all the changes made by a committed transaction become permanent in the database, surviving any subsequent failures.

关于本讲内容

祝各位学习愉快！

感谢观看！

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