Assignment Project Exam Help

Database Transactions – Part 2

https://eduassistpro.github.i

Add WeChat edu_assist_pr

ACID Properties

- DBMSs ensure the following properties of transactions.
  - **Atomicity**:
    - The execution of each transaction is atomic, i.e., **either all**

- **Isolation**:
  - Execution results of each transaction [...] d by **other concurrent executing tra[...]**
- **Durability**:
  - Once a transaction has been successfully completed, **its effects should persist in the database**.

Note: These properties are not independent from one another, but **atomicity is the central property**.

Atomicity

- **Atomicity** requires that we execute a transaction to completion with only two possibilities:
  - **ALL**: all the operations are executed;
  -

- If a t
  a
  tr

  Example: The money can only be taken from Stev has been transferred into Bob's account.

Operations	Steve	Bob
before 1	$1000	$200
after 1	$1000	$200
after 2	$500	$200
after 3	$500	$200
after 4	$500	$700

All are executed.

Assignment Project Exam Help

https://eduassistpro.github.i

Add WeChat edu_assist_pr

Consistency

Assignment Project Exam Help

- **Consistency** requires that each transaction should **preserve the consistency of the database**.

- N

  E https://eduassistpro.github.i

  Steve's account balance + Bob's account balance = $1200,

Add WeChat edu_assist_pr

Operations	Steve	Bob	
before 1	$1000	$200	
after 1	$1000	$200	
after 2	$500	$200	Not required to be consistent.
after 3	$500	$200	
after 4	$500	$700	$500+$700=$1200

Consistency [1]
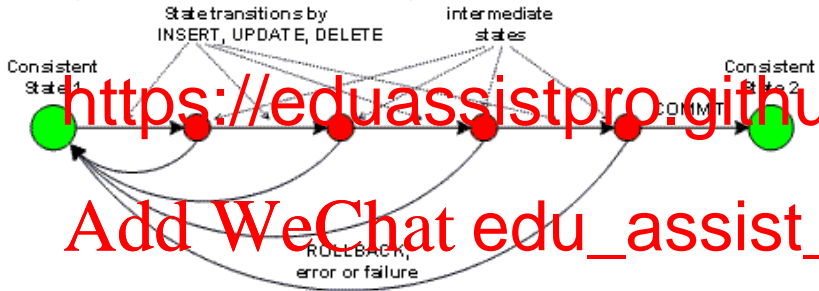
- The database is in a consistent state before and after executing the transaction, but is not necessarily consistent in intermediate states.

Isolation

Assignment Project Exam Help

- **Isolation** requires that transactions are **isolated from one another**.

E   (Steve's
ac   r the
m   https://eduassistpro.github.i

T_1
read(A)
write(A) (A:=A+500)
read(B)
write(B) (B:=B+500)
commit

Add WeChat edu_assist_pr

commit

Assignment Project Exam Help

https://eduassistpro.github.i

Add WeChat edu_assist_pr

Durability

Assignment Project Exam Help

- **Durability** requires that once the transaction is successfully completed, its ch

https://eduassistpro.github.i

- T
  to

- **Example:** Once Steve received the notification:

  $500 has been successfully transfer

Add WeChat edu_assist_pr

the money can't go back to Steve's account and must appear in Bob's account.

Assignment Project Exam Help

https://eduassistpro.github.i

Add WeChat edu_assist_pr