

RDBMS AND SQL CONCURRENCY CONTROL

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Slide contents are borrowed from the course text. For the authors' original version of slides, visit:
<https://www.db-book.com/db6/slide-dir/index.html>.

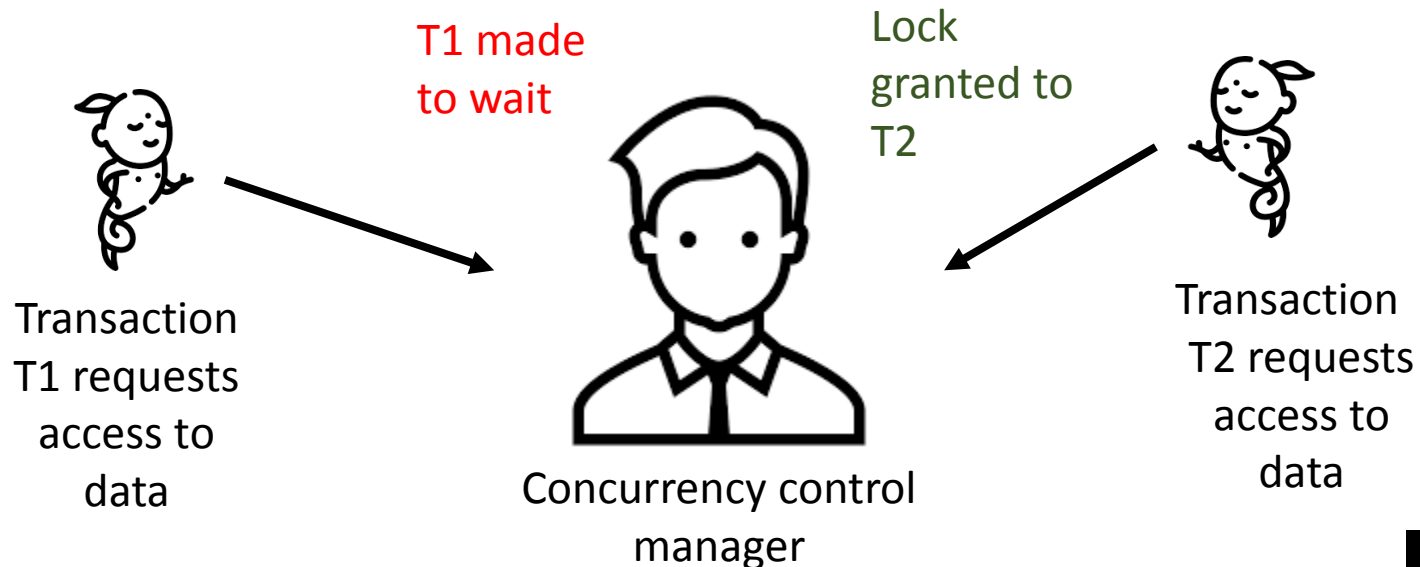
Ensuring Serializability

Access data items in a mutually exclusive manner

While one transaction access a data item, no other transaction can modify the same data item

Lock-Based Protocols

- Locking data items
 - Shared mode: Transaction T can read but not write.
 - Exclusive mode: T can both read and write.



Lock Example

```
 $T_1$ : lock-S(A);  
      read (A);  
      unlock(A);  
      lock-S(B);  
      read (B);  
      unlock(B);  
      display(A+B)
```

lock-S → Shared Mode
lock-X → Exclusive Mode

SQL and Locks

- If a thread is given a READ lock
 - That thread can only read from that table.
- If a thread is given a WRITE lock
 - No other thread can read/write to that table.

```
mysql> LOCK TABLES instr READ, course WRITE;
mysql> SELECT SUM(salary) FROM instr WHERE instr_id=99999;
mysql> UPDATE course SET course_name='dbms'
-> WHERE course_id=101;
mysql> UNLOCK TABLES;
```