

Transaction Processing

Exercise 1

Assignment 1: Why does a database management system need transaction management?

Assignment 2: Explain the nine functions by Codd. Which of these rules are in particular relevant for the transaction management?

Assignment 3: Which components of a database management are relevant for the transaction management?

Assignment 4: Which storage media are relevant for the transaction management? In which storage media would you store the following data:

1. archives
2. logs
3. database data
4. metadata

Assignment 5: Explain and compare semantic integrity and runtime integrity

Assignment 6: Explain the concept of transactions.

Assignment 7: Name and explain the components of the ACID-principle! Which targets are pursued with the ACID-principle?

Assignment 8: Explain the elements of a transaction (control) language. What causes transactions aborts? Which connection exists between internal operations and the transaction management?

Assignment 9: Which problems occur during multi-user operation?
Explain the different problems based on the following examples.

a)

T1	T2
r(K)	
K:=K+1	
w(K)	
	r(K)
	K:=K-2
	w(K)
	commit;
abort;	

b)

T1	T2
r(B)	
	r(K)
	r(B)
	K:=K+1
	B:=B+1
	w(K)
	w(B)
	commit;
r(K)	

c)

T1	T2
r(K)	
r(B)	
B:=B+1	
w(B)	
	r(K)
	r(B)
K:=K+1	
w(K)	
commit;	

Begin:(K=1, B=0), Constraint: (K ≥ 0) (B < K)

d)

T1	T2
r(A)	
	r(A)
A:=A+1	
	A:=A+1
w(A)	
	w(A)
	commit;
commit;	

e)

T1	T2
r(A)	
A:=A*1,1	
w(A)	
	r(A);r(B)
	A:=A+1;B:=B+1
	w(A);w(B)
	commit;
r(B)	
B:=B*1,1	
w(B)	
commit;	

Constraint: (A=B)

f)

T1	T2
	Position cursor on tuple B
Position cursor on tuple A	
	Process tuple
Process tuple	

g)

T1	T2
SELECT COUNT(*) INTO N FROM Artikel;	
	INSERT INTO Artikel VALUE('Fernseher', 1000)
	commit;
SELECT SUM(Preis) INTO S FROM Artikel;	
INSERT INTO Statistiken VALUE(GETDATE(), S/N)	
commit;	