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

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

T1 T2
- r(B)
- commit;

Anfangszustand Kontostand (K=1), Integritätsbedingung: (K ≥ 0) (B < K)

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

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

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

Integritätsbedingung: (A=B)

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

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

Integritätsbedingung: (A=B)

f) T1 T2
- Setze Pos. auf Tupel A
- Bearbeite Tupel A
- Verarbeite Tupel A

Exercise 1 2/3
### Exercise 1

#### Good Luck!

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECT COUNT(*) INTO N FROM Artikel;</td>
<td>INSERT INTO Artikel VALUE(&quot;Fernseher&quot;, 1000) commit;</td>
</tr>
<tr>
<td>SELECT SUM(Preis) INTO S FROM Artikel;</td>
<td></td>
</tr>
<tr>
<td>INSERT INTO Statistiken VALUE(GETDATE(), S/N) commit;</td>
<td></td>
</tr>
</tbody>
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