**OUTPUT FILE**

**#############################################################################**

**INPUT 1:**

b1;

r1 (Y);

w1 (Y);

r1 (Z);

b2;

r2 (X);

w2 (X);

w1 (Z);

e1;

r2 (Y);

b3;

r3 (Z);

w3 (Z);

w2 (Y);

e2;

r3 (X);

w3 (X);

e3;

**OUTPUT 1:**

Enter the path of the input file: /Desktop/input.txt

b1 - Begin of Transaction T1 with Timestamp 1

r1 (Y) - Transaction T1 locks data item Y in Read Lock mode and reads Y

w1 (Y) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Y

r1 (Z) - Transaction T1 locks data item Z in Read Lock mode and reads Z

b2 - Begin of Transaction T2 with Timestamp 2

r2 (X) - Transaction T2 locks data item X in Read Lock mode and reads X

w2 (X) - Read Lock of Transaction T2 is upgraded to Write Lock on data item X

w1 (Z) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Z

e1 - Transaction T1 is committed

r2 (Y) - Transaction T2 locks data item Y in Read Lock mode and reads Y

b3 - Begin of Transaction T3 with Timestamp 3

r3 (Z) - Transaction T3 locks data item Z in Read Lock mode and reads Z

w3 (Z); - Read Lock of Transaction T3 is upgraded to Write Lock on data item Z

w2 (Y) - Read Lock of Transaction T2 is upgraded to Write Lock on data item Y

e2 - Transaction T2 is committed

r3 (X) - Transaction T3 locks data item X in Read Lock mode and reads X

w3 (X) - Read Lock of Transaction T3 is upgraded to Write Lock on data item X

e3 - Transaction T3 is committed

Committed Transactions: T1 , T2 , T3

Aborted Transactions: None

**#############################################################################**

**INPUT 2:**

b1;

r1 (Y);

w1 (Y);

r1 (Z);

b2;

r2 (X);

w2 (X);

w1 (Z);

r2 (Y);

e1;

b3;

r3 (Z);

w3 (Z);

w2 (Y);

e2;

r3 (X);

w3 (X);

e3;

**OUTPUT 2:**

Enter the path of the input file: /Desktop/input.txt

b1 - Begin of Transaction T1 with Timestamp 1

r1 (Y) - Transaction T1 locks data item Y in Read Lock mode and reads Y

w1 (Y) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Y

r1 (Z) - Transaction T1 locks data item Z in Read Lock mode and reads Z

b2 - Begin of Transaction T2 with Timestamp 2

r2 (X) - Transaction T2 locks data item X in Read Lock mode and reads X

w2 (X) - Read Lock of Transaction T2 is upgraded to Write Lock on data item X

w1 (Z) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Z

r2 (Y) - Transaction T2 is aborted

e1 - Transaction T1 is committed

b3 - Begin of Transaction T3 with Timestamp 3

r3 (Z) - Transaction T3 locks data item Z in Read Lock mode and reads Z

w3 (Z); - Read Lock of Transaction T3 is upgraded to Write Lock on data item Z

w2 (Y) - Operation w2 (Y) is ignored since Transaction T2 is already aborted

e2 - Operation e2; is ignored since Transaction T2 is already aborted

r3 (X) - Transaction T3 locks data item X in Read Lock mode and reads X

w3 (X) - Read Lock of Transaction T3 is upgraded to Write Lock on data item X

e3 - Transaction T3 is committed

Committed Transactions: T1 , T3

Aborted Transactions: T2

**#############################################################################**

**INPUT 3:**

b1;

r1 (Y);

w1 (Y);

r1 (Z);

b2;

r2 (X);

w2 (X);

w1 (Z);

r2 (Y);

b3;

r3 (Z);

e1;

w3 (Z);

w2 (Y);

e2;

r3 (X);

w3 (X);

e3;

**OUTPUT 3:**

Enter the path of the input file: /Desktop/input.txt

b1 - Begin of Transaction T1 with Timestamp 1

r1 (Y) - Transaction T1 locks data item Y in Read Lock mode and reads Y

w1 (Y) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Y

r1 (Z) - Transaction T1 locks data item Z in Read Lock mode and reads Z

b2 - Begin of Transaction T2 with Timestamp 2

r2 (X) - Transaction T2 locks data item X in Read Lock mode and reads X

w2 (X) - Read Lock of Transaction T2 is upgraded to Write Lock on data item X

w1 (Z) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Z

r2 (Y) - Transaction T2 is aborted

b3 - Begin of Transaction T3 with Timestamp 3

r3 (Z) - Transaction T3 is aborted

e1 - Transaction T1 is committed

w3 (Z); - Operation w3 (Z); is ignored since Transaction T3 is already aborted

w2 (Y) - Operation w2 (Y) is ignored since Transaction T2 is already aborted

e2 - Operation e2; is ignored since Transaction T2 is already aborted

r3 (X) - Operation r3 (X) is ignored since Transaction T3 is already aborted

w3 (X) - Operation w3 (X) is ignored since Transaction T3 is already aborted

e3 - Operation e3; is ignored since Transaction T3 is already aborted

Committed Transactions: T1

Aborted Transactions: T2 , T3

**#############################################################################**

**INPUT 4:**

b1;

r1 (Y);

w1 (Y);

r1 (Z);

b2;

r2 (Y);

b3;

r3 (Z);

w1 (Z);

w2 (Y);

r2 (X);

e1;

e3;

w2 (X);

e2;

**OUTPUT 4:**

Enter the path of the input file: /Desktop/input.txt

b1 - Begin of Transaction T1 with Timestamp 1

r1 (Y) - Transaction T1 locks data item Y in Read Lock mode and reads Y

w1 (Y) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Y

r1 (Z) - Transaction T1 locks data item Z in Read Lock mode and reads Z

b2 - Begin of Transaction T2 with Timestamp 2

r2 (Y) - Transaction T2 is aborted

b3 - Begin of Transaction T3 with Timestamp 3

r3 (Z) - Data item Z is already locked by another transaction in Read Lock mode. Transaction T3 locks data item Z in Read Lock mode and reads Z

w1 (Z) - Transaction T1 is blocked. It waits for data item Z

w2 (Y) - Operation w2 (Y) is ignored since Transaction T2 is already aborted

r2 (X) - Operation r2 (X) is ignored since Transaction T2 is already aborted

e1; - Transaction T1 is already blocked. So add operation "e1; " to wait list

e3 - Transaction T3 is committed

w1 (Z) - Transaction T1 is released from wait list and upgrades read lock to write lock on data item Z

e1; - Transaction T1 is committed

w2 (X) - Operation w2 (X) is ignored since Transaction T2 is already aborted

e2 - Operation e2; is ignored since Transaction T2 is already aborted

Committed Transactions: T3 , T1

Aborted Transactions: T2

**#############################################################################**

**INPUT 5:**

b1;

r1 (Y);

w1 (Y);

r1 (Z);

b2;

r2 (Y);

b3;

r3 (Z);

w1 (Z);

w2 (Y);

r2 (X);

e1;

w3 (Z);

e3;

w2 (X);

e2;

**OUTPUT 5:**

Enter the path of the input file: /Desktop/input.txt

b1 - Begin of Transaction T1 with Timestamp 1

r1 (Y) - Transaction T1 locks data item Y in Read Lock mode and reads Y

w1 (Y) - Read Lock of Transaction T1 is upgraded to Write Lock on data item Y

r1 (Z) - Transaction T1 locks data item Z in Read Lock mode and reads Z

b2 - Begin of Transaction T2 with Timestamp 2

r2 (Y) - Transaction T2 is aborted

b3 - Begin of Transaction T3 with Timestamp 3

r3 (Z) - Data item Z is already locked by another transaction in Read Lock mode. Transaction T3 locks data item Z in Read Lock mode and reads Z

w1 (Z) - Transaction T1 is blocked. It waits for data item Z

w2 (Y) - Operation w2 (Y) is ignored since Transaction T2 is already aborted

r2 (X) - Operation r2 (X) is ignored since Transaction T2 is already aborted

e1 - Transaction T1 is already blocked. So add operation "e1;" to wait list

w3 (Z); - Transaction T3 is aborted

w1 (Z) - Transaction T1 is released from wait list and upgrades read lock to write lock on data item Z

e1 - Transaction T1 is committed

e3 - Operation e3; is ignored since Transaction T3 is already aborted

w2 (X) - Operation w2 (X) is ignored since Transaction T2 is already aborted

e2 - Operation e2; is ignored since Transaction T2 is already aborted

Committed Transactions: T1

Aborted Transactions: T2 , T3

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