CSCI3170 Short Assignment #5 (Solution)

Name: Pass / Fail

Student ID:

1. Consider the following history:

|  |  |  |
| --- | --- | --- |
| T1 | T2 | T3 |
| Read[b] |  |  |
|  | Write[b] |  |
| Write[b] |  |  |
|  | Write[a] |  |
|  |  | Read[a] |

1. Draw the conflict serialization graph of the above history. Please arrange your nodes as follows.

**Ans:**



1. Is the history in part (a) conflict serializable? Why?

**Ans:**

No, because there is a cycle in the serialization graph.

1. Suppose each log record for recovery describes a single database write with the following fields <Transaction name, Data item name, Old value, New value>. After a crash failure, the following log records are found in disk.

|  |
| --- |
| Log Record |
| <T1, start> |
| <T1, A, 0, 100> |
| <T2, start> |
| <T1, B, 0, 200> |
| <T1, commit> |
| <T2, B, 200, 300> |

Suppose the values of A and B found in the disk after the crash are 0 and 300 respectively.

1. Which recovery strategy (deferred update or immediate update) is used by the system? Please explain.

**Ans:**

It is immediate update as the values are written into the database before a transaction has committed.

1. Which transaction has committed before the Crash?

**Ans:**

T1

1. Please fill the action (redo/undo/no action) and the values of A and B in the following table after each log record for write operation is considered in the recovery process.

**Ans:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Action(redo/undo/no action) | A | B |
|  |  | 0 | 300 |
| **<T2,B,200,300>** | undo | 0 | 200 |
| **<T1,B,0,200>** | no action | 0 | 200 |
| **<T1,A,0,100>** | redo | 100 | 200 |