

CS143: Database Systems

Homework #8

1. Consider the relation `Employee(name, salary)` where `name` is the key. The following three transactions are being executed:

T_1 :

```
SELECT SUM(salary) FROM Employee;  
COMMIT;
```

T_2 :

```
UPDATE Employee SET salary = salary + 200;  
UPDATE Employee SET salary = salary + 1000 WHERE name = 'Tony';  
COMMIT;
```

T_3 :

```
UPDATE Employee SET salary = salary + 100 WHERE name = 'James';  
UPDATE Employee SET salary = salary + 200 WHERE name = 'Tony';  
COMMIT;
```

The table `Employee` originally has two tuples, ('Tony', 1000) and ('James', 1000). Please assume that individual SQL statements are executed atomically.

- (a) Assume that all three transactions run under the isolation level `SERIALIZABLE`. List all possible values that can be returned by T_1 . Briefly explain your answer.
- (b) Assume that T_1 runs under the isolation level `READ UNCOMMITTED` and T_2 under `REPEATABLE READ` and T_3 under `SERIALIZABLE`. List all possible values that can be returned by T_1 . Briefly explain your answer.