Homework #4 :
Concurrency Control in Oracle

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Isolation level

- Oracle supports 3 **isolation level**
  - READ COMMITTED (default)
  - SERALIZABLE
  - Read-Only

Isolation level

- How to change Isolation level in oracle

SET TRANSACTION ISOLATION LEVEL **READ COMMITTED** ;

- How to check Isolation level in oracle

1) sqlplus system/oracle
2) SELECT sid, value FROM v$ses_optimizer_env WHERE name
LIKE %isolation%' AND sid = (SELECT DISTINCT sid FROM v$mystat);

Isolation level

```
[oracle@localhost oracle]$ sqlplus system/oracle

SQL*Plus: Release 12.2.0.1.0 Production on Mon Jun 4 23:59:34 2018

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Last Successful login time: Mon Jun 04 2018 23:58:51 -04:00

Connected to:
Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SQL> SELECT sid, value FROM v$ses_optimizer_env WHERE name LIKE '%isolation%' AND sid = (SELECT DISTINCT sid FROM v$mystat);

       SID VALUE
---------- -------------------------
        87 read_commited

SQL> SET TRANSACTION ISOLATION LEVEL SERIALIZABLE;

Transaction set.

SQL> SELECT sid, value FROM v$ses_optimizer_env WHERE name LIKE '%isolation%' AND sid = (SELECT DISTINCT sid FROM v$mystat);

       SID VALUE
---------- -------------------------
        87 serializable
```

Homework Guide

Build Tables for homework !

- ## Problem #1

  ```
  CREATE PROBLEM 1 ( data vachar2(10));

  INSERT INTO PROBLEM1 VALUES ('A');
  ```

- ## Problem #2

  ```
  drop table professor;
  create table professor (name varchar2(30) not null,
  major varchar2(15) not null,
  tel varchar2(50) not null);
  insert into professor values ('Sang-Won Lee', 'sw', '031-290-7971');
  insert into professor values ('Young Ik Eom', 'sw', '031-290-7120');
  insert into professor values ('Nam-Gyu Park', 'chemistry' , '031-290-7241');
  insert into professor values ('UngMo Kim', 'sw', '031-299-7950');
  insert into professor values ('Jonung-Real Ahn', 'physics' , '031-299-5901');
  insert into professor values ('Ji-Young Hwang', 'sw', '031-299-4396');
  insert into professor values ('Jongwuk Lee', 'sw' , '031-299-4329');
  commit;
  ```

Homework Guide

Q. How to use multiple sessions ?

Session 1   **Session 2**

- Execute **two terminals** in Oracle VM!
- Do screen-shot like this page.

Problem #1-1

- SET TX_ISOLATION : **READ COMMITTED** **both sessions***

Time

Session 1   (2) INSERT ('B')   (4) COMMIT

Session 2   (1) SELECT *   (3) SELECT *   (5) SELECT *

① ② ③
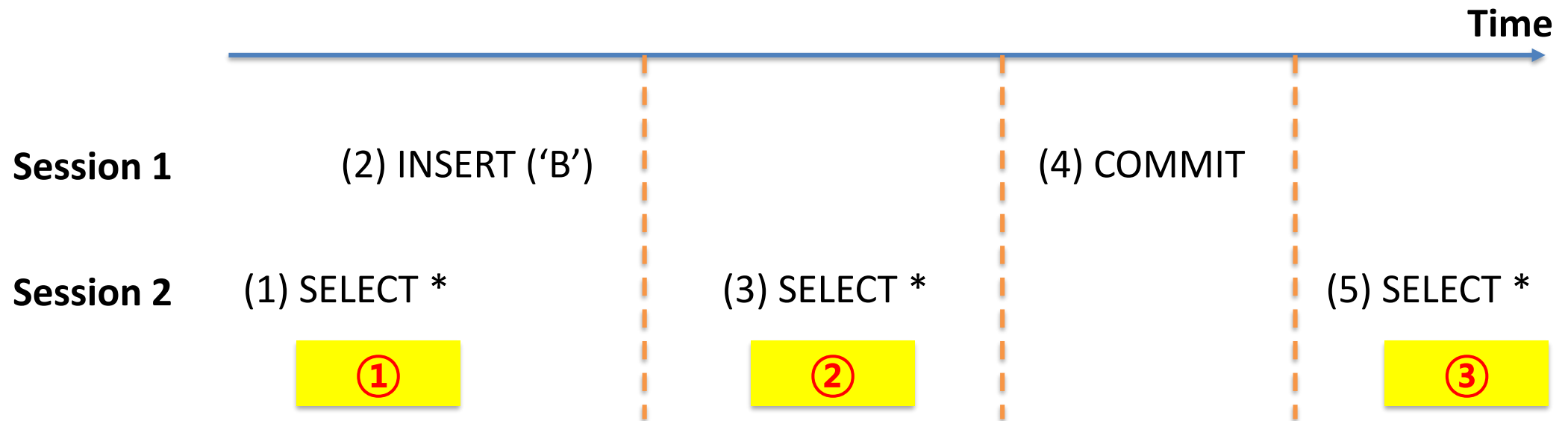
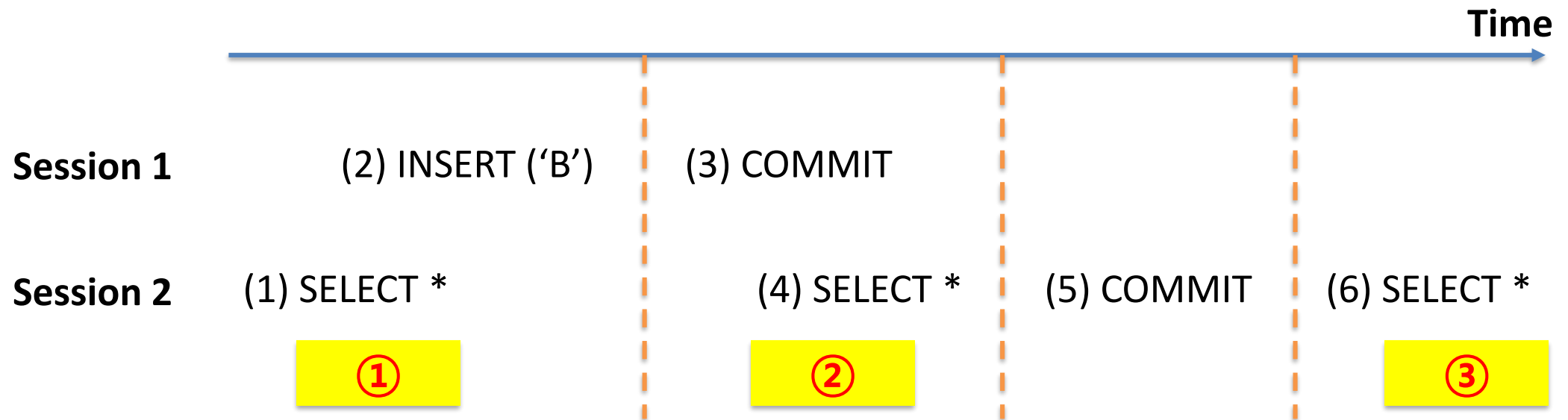Q1. Fill in the blank if the result exists (Result of "select")

Q2. What is the problem in this situation?

Q3. Screen shot

INSERT('B') : Insert 'B' into PROBLEM1 Table
SELECT * : Select all value from PROBLEM1 Table

Problem #1-2

- SET TX_ISOLATION : **SERIALIZABLE** **both sessions***

Time

Session 1
(2) INSERT ('B')   (3) COMMIT

Session 2
(1) SELECT *   (4) SELECT *   (5) COMMIT   (6) SELECT *
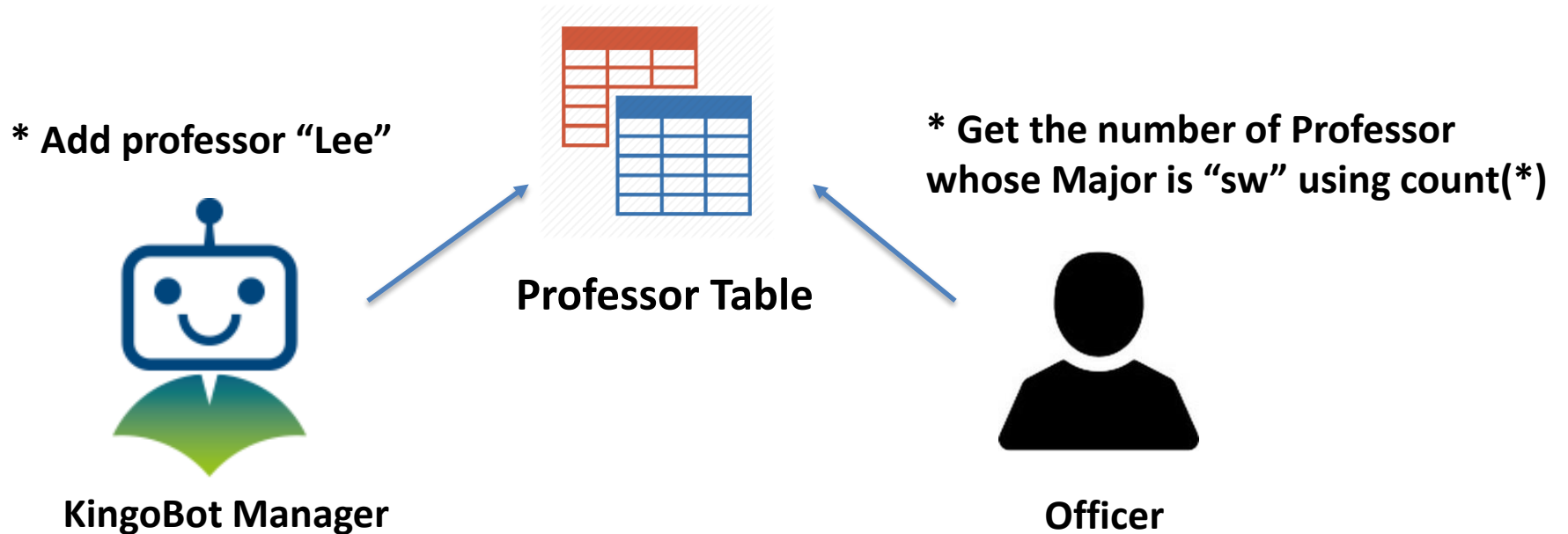
①   ②   ③

Q1. Fill in the blank if the result exists (Result of "select")

Q2. What is different with Problem#1-1 ?

Q3. Screen shot

INSERT('B') : Insert 'B' into PROBLEM1 Table
SELECT * : Select all value from PROBLEM1 Table

Problem #2

* Add professor "Lee"

Professor Table

* Get the number of Professor whose Major is "sw" using count(*)

KingoBot Manager

Officer

This is ***NOT*** answer
- Officer don't work until Kingobot Manager finished

Problem #2

Phantom problem in KingoBot

- KingoBot manager inputs the below information on professors table
- Officer get the number of SW professors and this value ***must* be consistent** until commit
- KingoBot manager and Officer work **concurrent**

  ** INFO **
  - ('KIM', 'physics' , '031-222-222')
  - ('PARK', 'sw', '031-333-333')
  - ('LEE' , 'math' , '031-111-111')

Q1. Define the problem that can arise in this situation.

Q2. What is the solution ?

Q3. Show the problem and solution in Oracle VM (Screen shot).   **Hint ! Phantom Read**

Problem #3

- Make your own scenario which we ***must*** use the "serializable isolation"

1) Describe the table structure & sample data

2) Describe the scenario

3) Screen shot

Hint ! Case: some values must be *consistent* until transaction ends

NOTICE

- **Don't turn** on the "auto commit" mode
- Set transaction isolation level **first** in session
- Attach screen-shot of each phase of problem
- Upload I-campus **June 18th 9:00 AM**
- **Q&A**
  - https://github.com/JonghyeokPark/SWE3003/issues