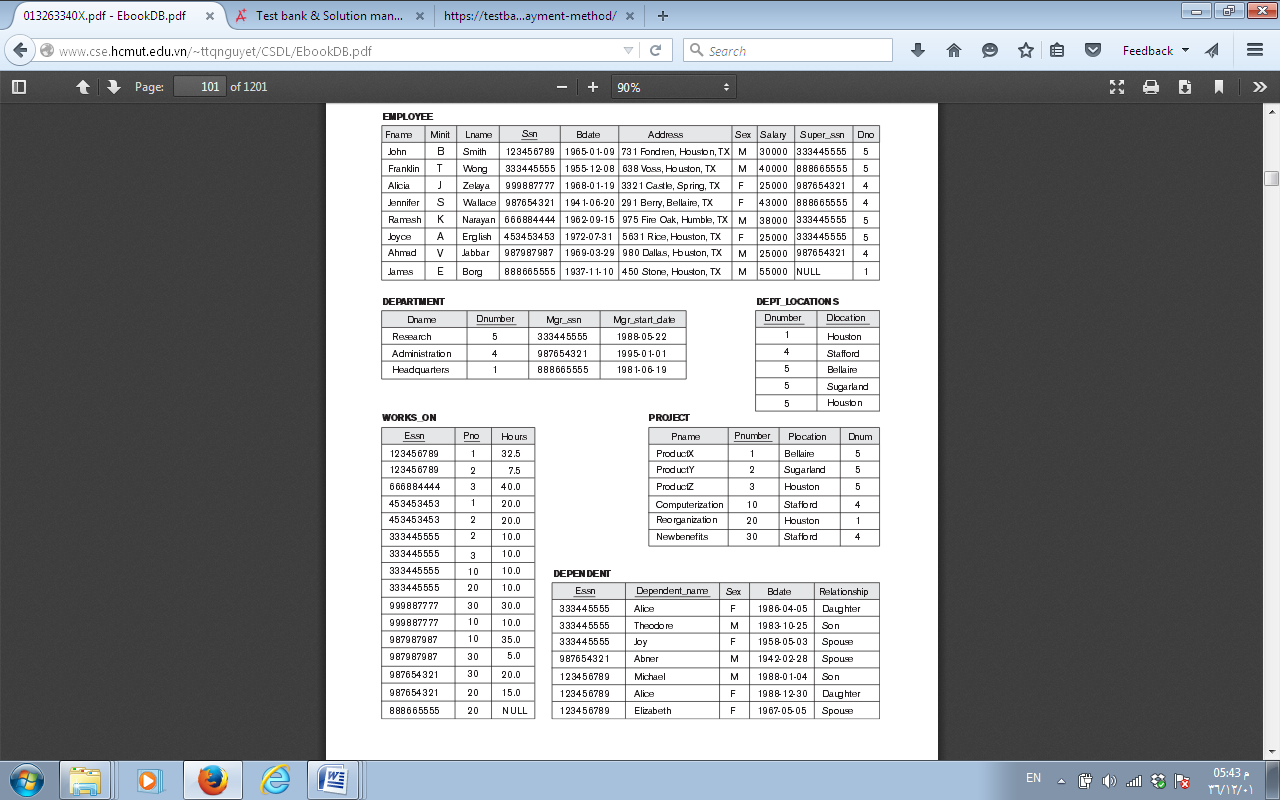
**Tutorial 2**

**GC 312**

**Problem 1:**

Suppose each of the following Update operations is applied directly to the database below. Discuss *all* integrity constraints violated by each operation, if any, and the different ways of enforcing these constraints:

  
(a) Insert < 'Robert', 'F', 'Scott', '943775543', '21-JUN-42', '2365 Newcastle Rd,

Bellaire, TX', M, 58000, '888665555', 1 > into EMPLOYEE.

(b) Insert < 'ProductA', 4, 'Bellaire', 2 > into PROJECT.

(c) Insert < 'Production', 4, '943775543', '01-OCT-88' > into DEPARTMENT.

(d) Insert < '677678989', null, '40.0' > into WORKS\_ON.

(e) Insert < '453453453', 'John', M, '12-DEC-60', 'SPOUSE' > into DEPENDENT.

(f) Delete the WORKS\_ON tuples with ESSN= '333445555'.

(g) Delete the EMPLOYEE tuple with SSN= '987654321'.

(h) Delete the PROJECT tuple with PNAME= 'ProductX'.

(i) Modify the MGRSSN and MGRSTARTDATE of the DEPARTMENT tuple with DNUMBER=5 to '123456789' and '01-OCT-88', respectively.

(j) Modify the SUPERSSN attribute of the EMPLOYEE tuple with SSN= '999887777' to

'943775543'.

(k) Modify the HOURS attribute of the WORKS\_ON tuple with ESSN= '999887777' and

PNO= 10 to '5.0'.

**Problem 2:**

Consider the following relations for a database that keeps track of student enrollment in courses and the books adopted for each course:

STUDENT (SSN, Name, Major, Bdate)

COURSE (Course#, Quarter, Grade)

ENROLL (SSN, Course#, Quarter, Grade)

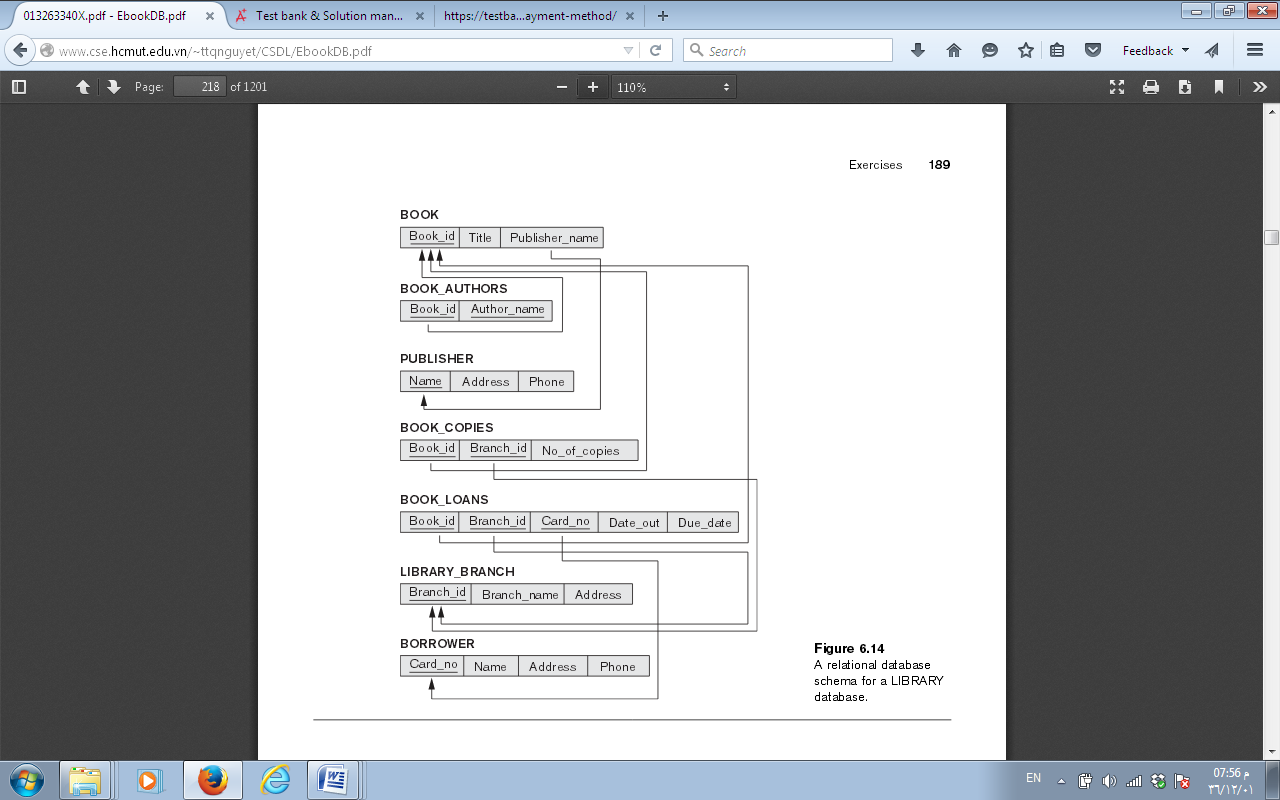
BOOK\_ADOPTION (Course#, Quarter, Book\_ISBN)

TEXT (Book\_ISBN, Book\_Title, Publisher, Author)

Specify the foreign keys for this schema, stating any assumptions you make.

**Problem 3:**

Consider the LIBRARY relational database schema. Choose the appropriate action (reject, cascade, set to null, set to default) for each referential integrity constraint, both for the *deletion* of a referenced tuple, and for the *update* of a primary key attribute value in a referenced tuple. Justify your choices.

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**Problem 4:**

Consider the EMPLOYEE table’s constraint EMPSUPERFK is read as follows:

CONSTRAINT EMPSUPERFK

FOREIGN KEY (Super\_ssn ) REFERENCES EMPLOYEE (Ssn )

ON DELETE CASCADE ON UPDATE CASCADE,

Answer the following questions:

a. What happens when the following command is run on the COMPANY database state ?

DELETE EMPLOYEE WHERE Lname = ‘Borg’

b. Is it better to CASCADE or SET NULL in case of EMPSUPERFK constraint ON DELETE ?