Department of Software Engineering Mehran University of Engineering and Technology, Jamshoro			
Course: SWE324 - Data Warehousing and Data Mining			
Instructor	Rabeea Jaffari	**Practical/Lab No.**	02
Date	09 April 2019	**CLOs**	CLO-4: P3 & P4
Signature		**Assessment Score**	1 Marks

Topic	**To become Familiar with OLTP System Design**
Objectives	- To learn conceptual and logical Transactional Database Design

Lab Discussion: Theoretical concepts and Procedural steps

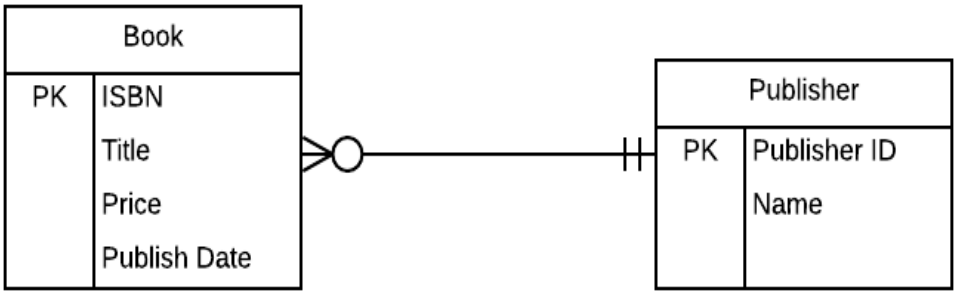
Lab Tasks

Submission Date: 16-04-19

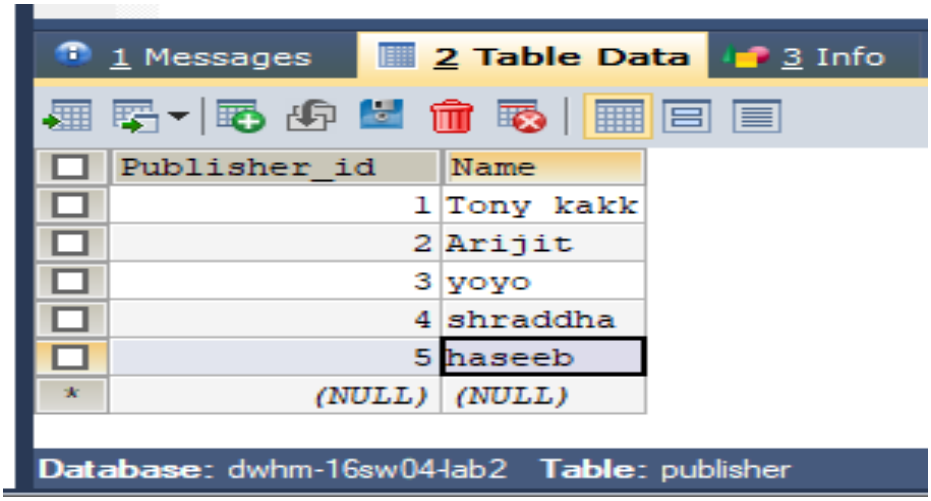
1. For each of the descriptions below, perform the following tasks:
   i. Physically implement the systems in any suitable OLTP product with proper keys, data types and relationships.
   ii. Insert dummy data up to 5 rows.

   a. **A book is identified by its ISBN number, and it has a title, a price, and a date of publication. It is published by a publisher, which has its own ID number and a name. Each book has exactly one publisher, but one publisher typically publishes multiple books over time.**

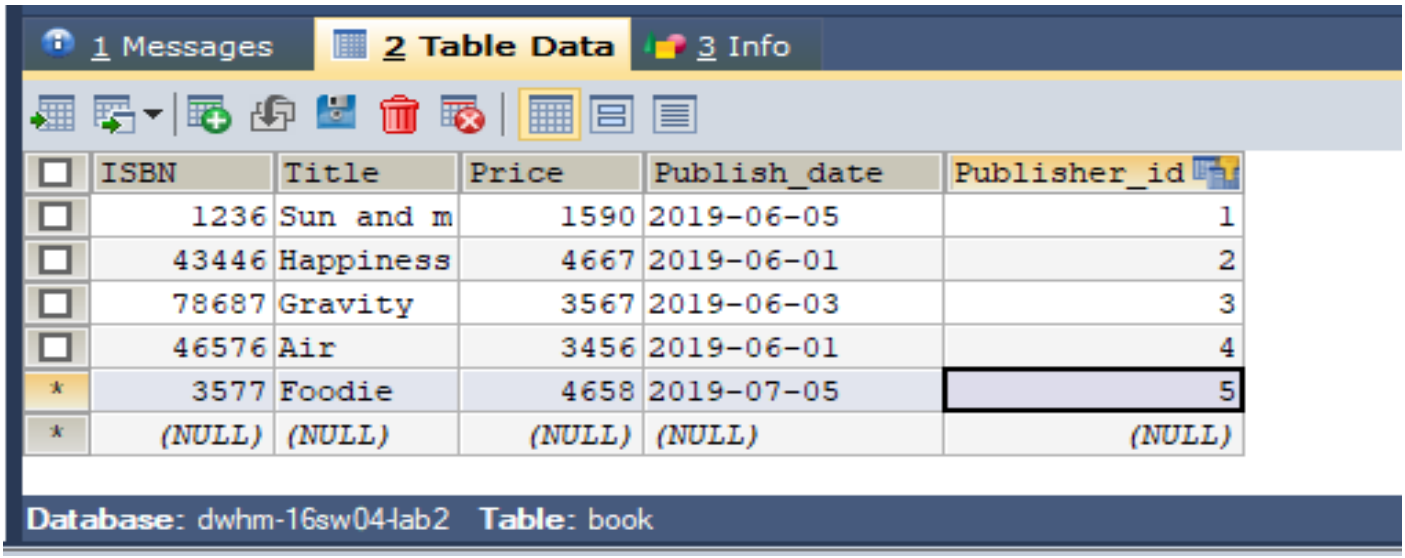
- This relationship is a degree of 2 (binary).
- This relationship is one-to-many from Publisher to Book.

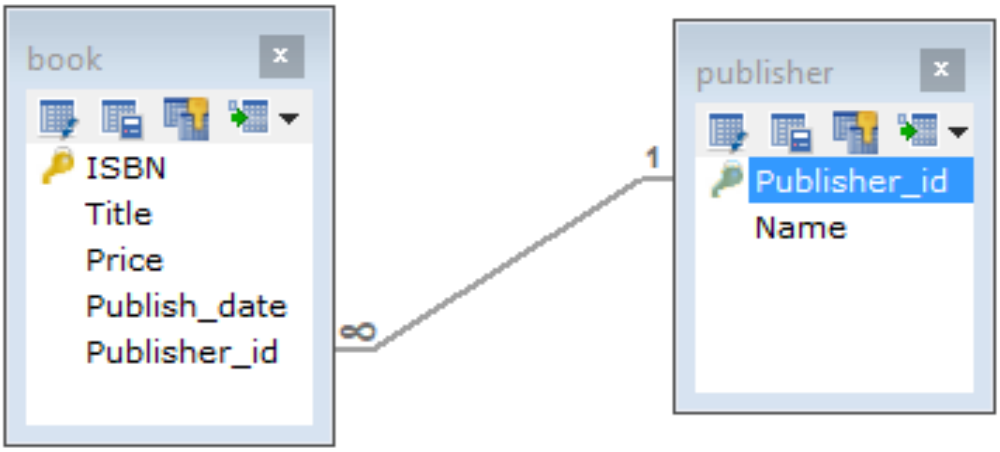


Publisher:



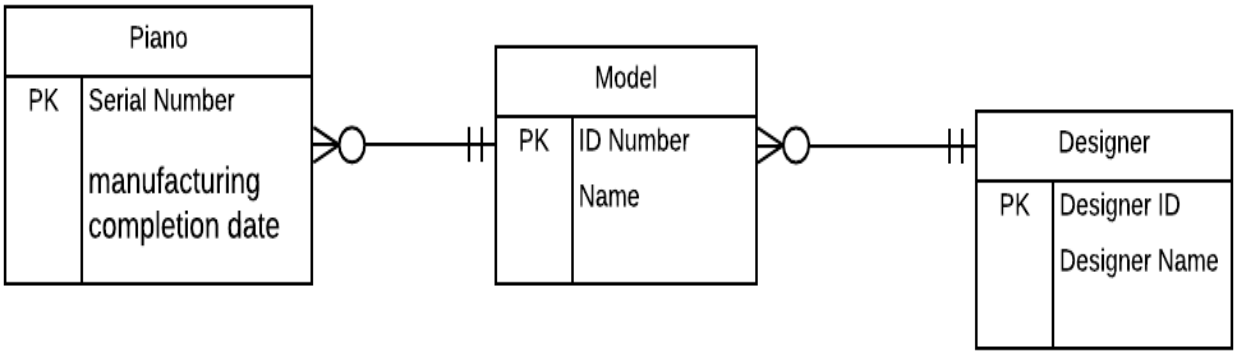
Book:



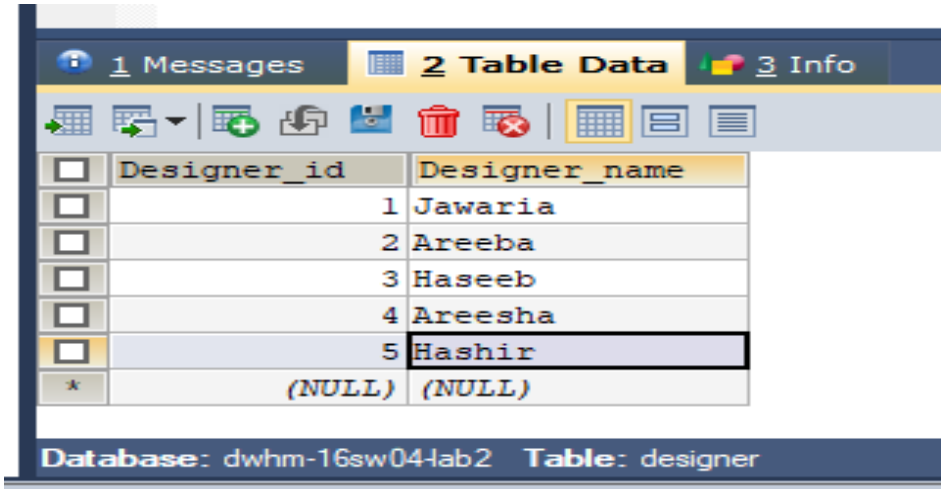


b. A piano manufacturer wants to keep track of all the pianos it makes individually. Each piano has an identifying serial number and a manufacturing completion date. Each instrument represents exactly one piano model, all of which have an identification number and a name. In addition, the company wants to maintain information about the designer of the model. Over time, the company often manufactures thousands of pianos of a certain model, and the model design is specified before any single piano exists.

- These relationships have a degree of 2 (binary).
- These relationships are one-to-many.



Designer:



Model:

1 Messages | 2 Table Data | 3 Info

	ID_number	Name	Designer_id
	1	A16SW04	1
	2	B16SW04	3
	3	C16SW04	2
	4	D16SW04	4
	5	E16SW04	5
*	(NULL)	(NULL)	(NULL)

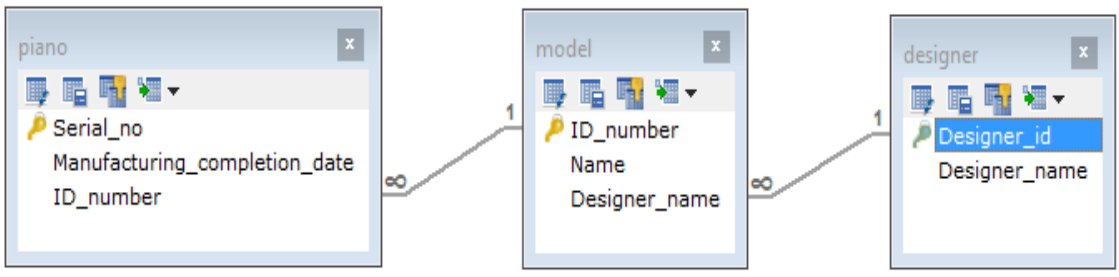
Database: dwhm-16sw04-lab2 Table: model

Piano:

1 Messages | 2 Table Data | 3 Info

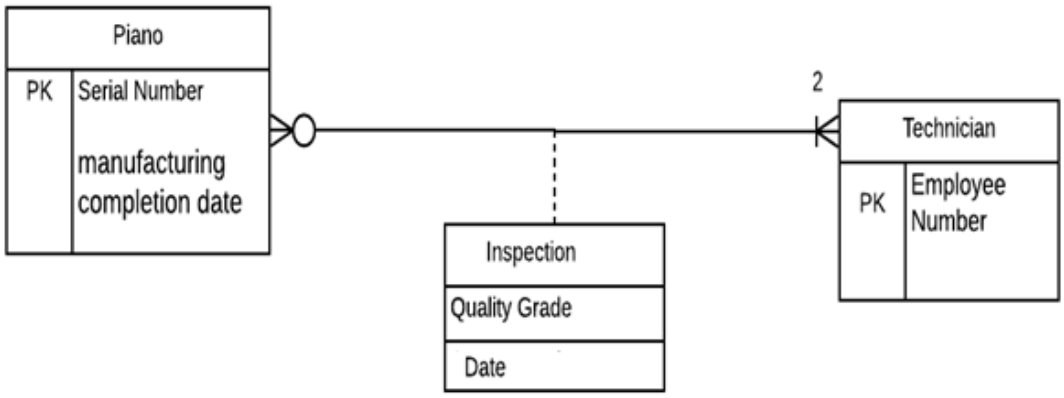
	Serial_no	Manufacturing_completion_date	ID_number
	11	2019-06-01	1
	22	2019-06-07	2
	33	2019-06-08	3
	44	2019-05-30	4
	55	2019-05-02	5
*	(NULL)	(NULL)	(NULL)

Database: dwhm-16sw04-lab2 Table: piano



c. **A piano manufacturer (see above) employs piano technicians who are responsible for inspecting the instruments before they are shipped to the customers. Each piano is inspected by at least two technicians (identified by their employee number). For each separate inspection, the company needs to record its date and a quality evaluation grade.**

- This relationship is a degree of 2 (binary).
- This relationship is many-to-many.



Inspection:

1 Messages | 2 Table Data | 3 Info

Inspection_id	Quality_grade	Date
1	A	2019-06-13
2	D	2019-06-07
3	B	2019-06-03
4	A	2019-06-01
5	F	(NULL)
(NULL)	(NULL)	(NULL)

Database: dwhm-16sw04-lab2 Table: inspection

Technician:

1 Messages | 2 Table Data | 3 Info

Employee_no	Inspection_id
11	1
22	2
33	3
44	4
(NULL)	(NULL)

Database: dwhm-16sw04-lab2 Table: technician

Bridge Table:

1 Messages | 2 Table Data | 3 Info

techno_bridge	Employee_no
1	11
2	22
3	33
4	44
5	(NULL)
(NULL)	(NULL)

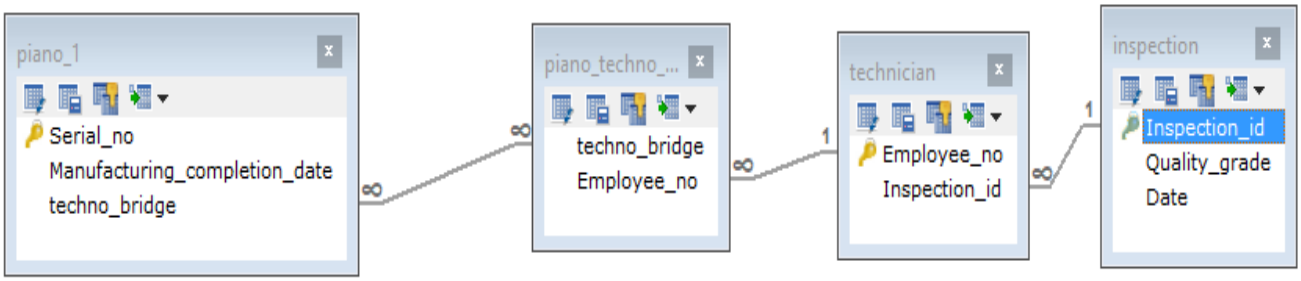
Database: dwhm-16sw04-lab2 Table: piano_techno_bridge

Piano:

1 Messages | 2 Table Data | 3 Info

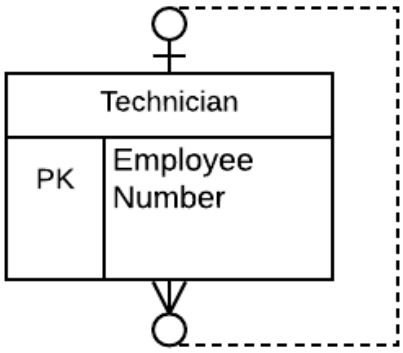
Serial_no	Manufacturing_completion_date	techno_bridge
11	2019-06-01	1
22	2019-06-07	2
33	2019-06-08	3
44	2019-05-30	4
55	2019-05-02	5
(NULL)	(NULL)	(NULL)

Database: dwhm-16sw04-lab2 Table: piano_1

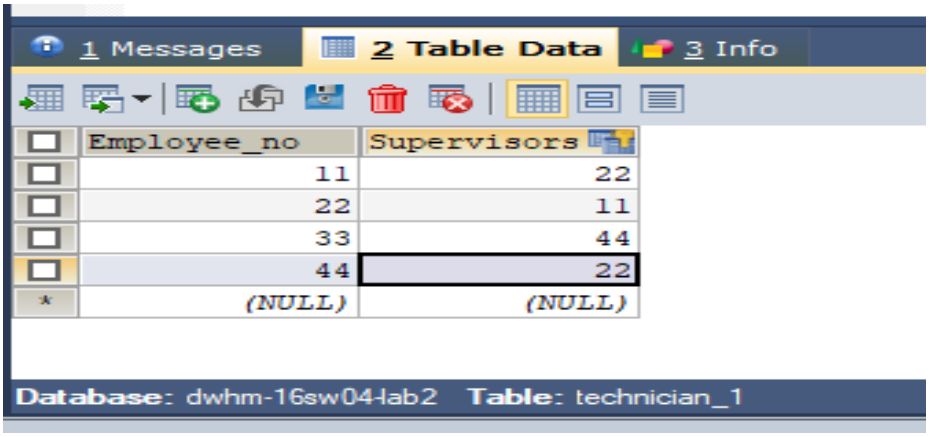


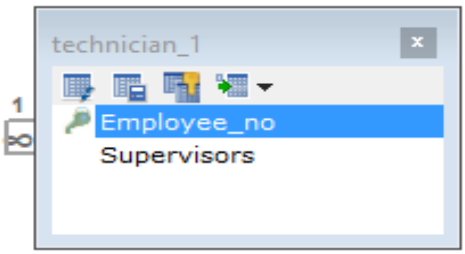
d. The piano technicians (see above) have a hierarchy of reporting relationships: Some of them have supervisory responsibilities in addition to their inspection role and have multiple other technicians report to them. The supervisors themselves report to the chief technician of the company.

- This relationship is a degree of 1 (unary).
- This relationship is one-to-many.



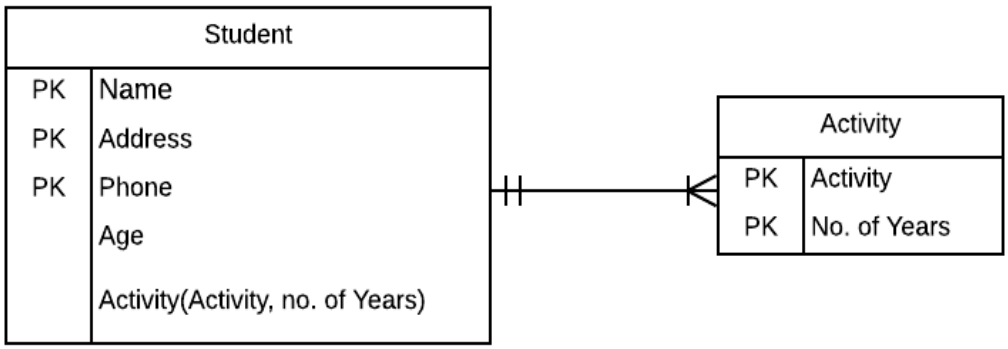
Technician:



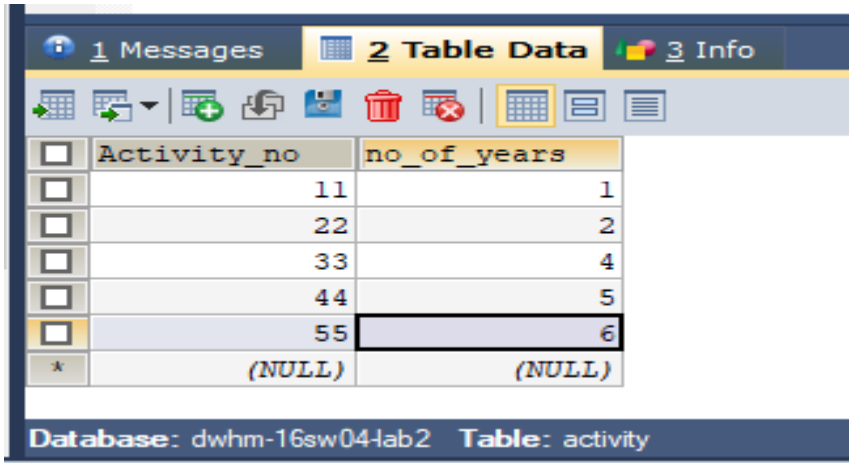


e. The entity type STUDENT has the following attributes: Student Name, Address, Phone, Age, Activity, and No of Years. Activity represents some campus-based student activity, and No of Years represents the number of years the student has engaged in this activity. A given student may engage in more than one activity. Draw a logical ERD for this situation. What attribute or attributes did you designate as the identifier for the STUDENT entity? Why?

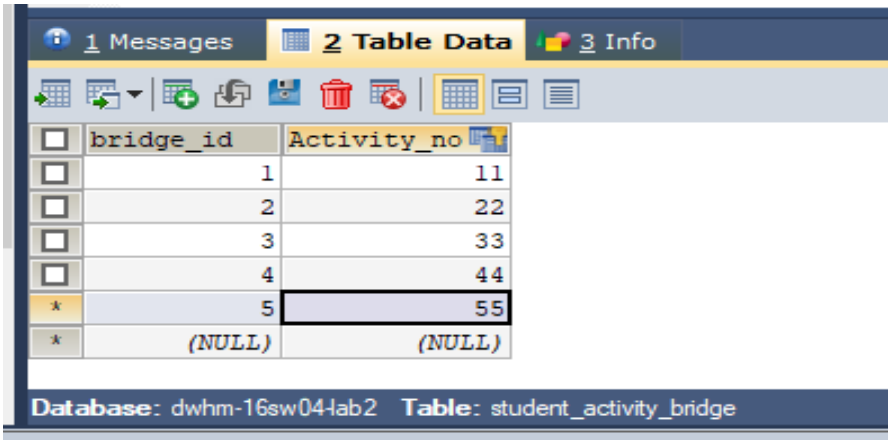
- This relationship is a degree of 2 (binary).
- This relationship is one-to-many.
- Name, Address and Phone are designated as the identifier for the student. Since, many students can have same name. In addition with name, address and phone are also designated as identifier for the student.



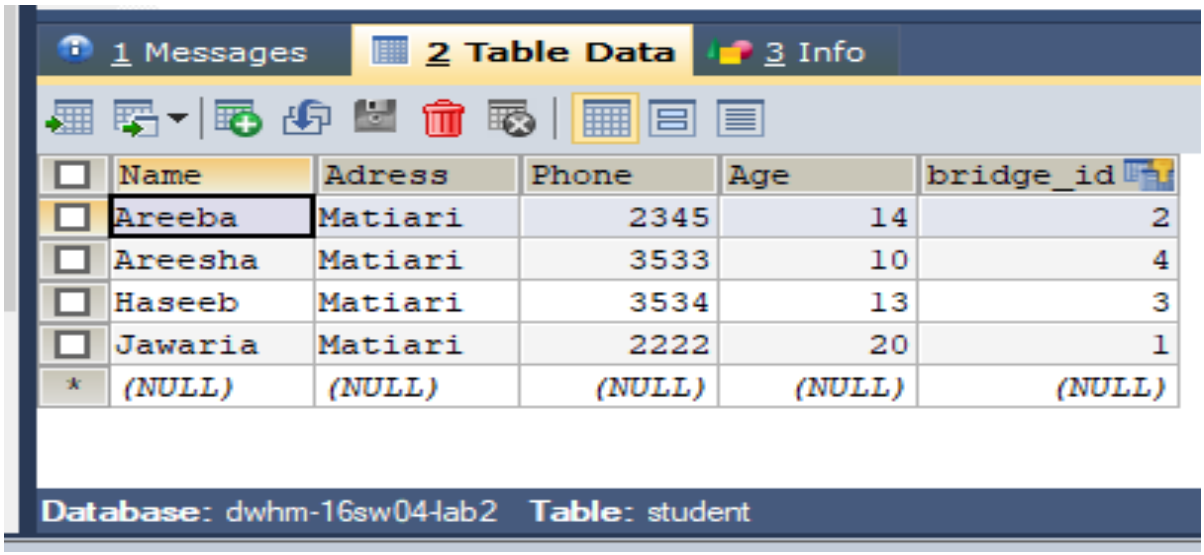
Activity:

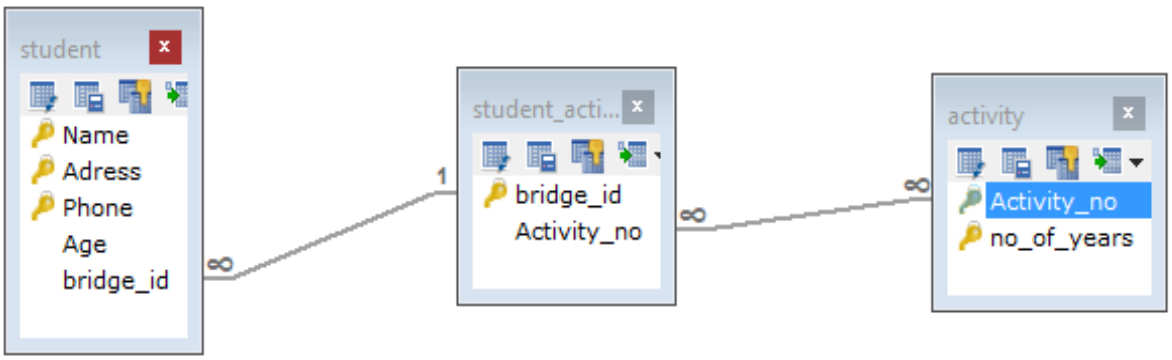


Bridge Table:



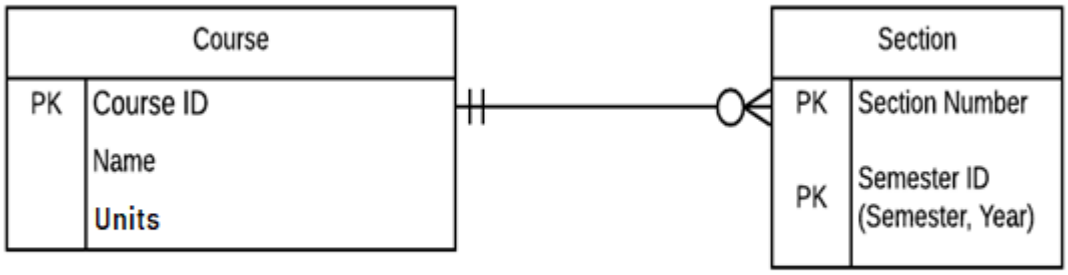
Student:



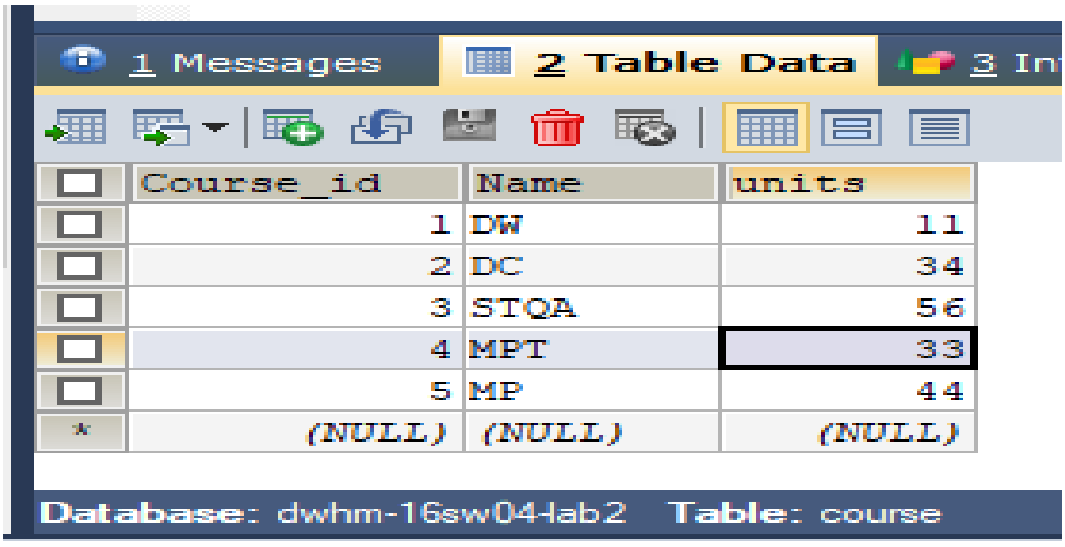


f. A college course may have one or more scheduled sections or may not have a scheduled section. Attributes of COURSE include Course ID, Course Name, and Units. Attributes of SECTION include Section Number and Semester ID. Semester ID is composed of two parts: Semester and Year. Section Number is an integer (such as 1 or 2) that distinguishes one section from another for the same course but does not uniquely identify a section. How did you model SECTION? Why did you choose this way versus alternative ways to model SECTION?

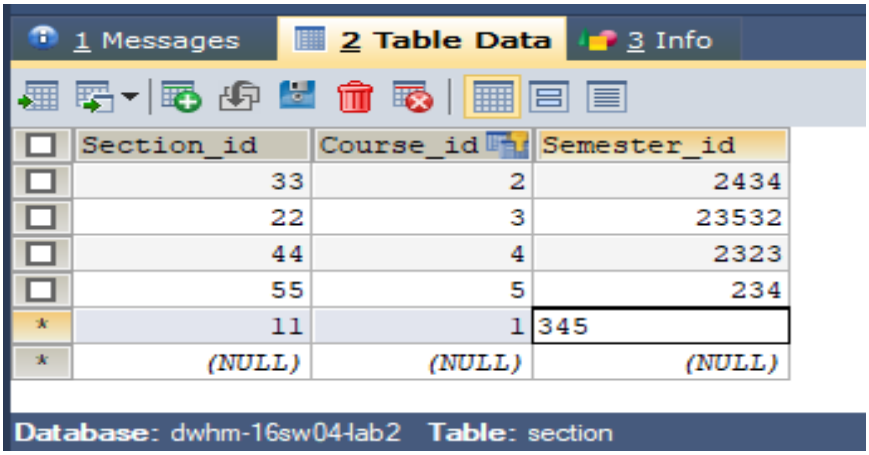
- This relationship is a degree of 2 (binary).
- This relationship is one-to-many.
- Since, section is modeled as a weak entity. Therefore, Section number and Semester ID are used as identifiers to uniquely identify a section.



Course:



Section:


1 Messages
2 Table Data
3 Info
Section_id
Course_id
Semester_id
33 2 2434
22 3 23532
44 4 2323
55 5 234
11 1 345
(NULL) (NULL) (NULL)
Database: dwhm-16sw04-lab2
Table: section


course
Course_id
Name
units
1
∞
section
Section_id
Course_id
Semester_id