

EXAM 1 506

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PART 1

1.

Table 1.1 Student table.

Stu_Num	Stu_Name
321452	Browser
324257	Smithson

Table 1.2 Class table.

Class_Code	Class_Title	Class_Time	Class_Room
10014	ACCT-211	TTh 2:30-3:45 p.m	BUS252
10018	CIS-220	MWF 9:00-9:50 a.m	KLR211
10021	QM-261	MWF 8:00-8:50 a.m	KLR200

Table 1.3 Student Database.

Stu_Num	Class_Code
321452	10014
321452	10018
321452	10021
324257	10014
324257	10018
324257	10021

2. The process I followed in creating the student database including the following. Firstly, I created tables about each entity in the list. In Table 1.1, the student table includes the student number and student name which gives information regarding the students. Likewise, Table 1.2 gives information about the classes such as the class code, class title, class time and class room. Then, I created the intersection table because of the many to many relationships between the students and the classes.

3. Primary key is a unique number used to identify a row. It is also used to represent rows in relationships. A foreign key is a primary key from a table now used in another table to show the relationship between the two tables. It is important to look out for the referential integrity constraints when using foreign keys.

The primary keys in Table 1.1 and Table 1.2 are the Stu_Num and Class_Code respectively while in Table 1.3 Stu_Num and Class_Code both serve as primary and foreign keys.

4. A composite key is a candidate key that consists of two or more attributes (table columns) that together uniquely identify an entity occurrence (table row). Stu_Num and Class_code joined together can form the composite key to identify a row in the table. However, I created two separate tables; student and class table each with primary key and then created an intersection table with their primary keys. I did not combine them to form a composite key.

The Class_title can be a composite if it was made from a combination of two or more attributes. For example, if ACCT-211 is a combination of ACCT and 211 from two different tables then it could be considered a composite key. Likewise, Class_room, if BUS252 is a combination of BUS and 252.

5.

Table 5.1 Artist Table

ArtistID	ArtistName
A001	David Guetta
A002	Fetty Wap
A003	Flo Rida
A004	Rihanna
A005	Shakira
A006	Sia

Table 5.2 Song Table

SongID	SongTitle
S001	Louder Than Words
S002	Bang My Head
S003	Club Can't Handle
S004	How I Feel
S005	My House
S006	Only 1 Flo Part 1 EP
S007	American Oxygen
S008	Close To You
S009	Right Now
S010	Can't Remember To Forget You
S011	Chandelier
S012	Clap Your Hands
S013	She Wolf (Falling To Pieces)

S014	Titanium
S015	Wild Ones

Table 5.3 Related database

SongID	SongTitle	ArtistID
S001	Louder Than Words	A001
S002	Bang My Head	A002
S003	Club Can't Handle	A003
S004	How I Feel	A003
S005	My House	A003
S006	Only 1 Flo Part 1 EP	A003
S007	American Oxygen	A004
S008	Close To You	A004
S009	Right Now	A004
S010	Can't Remember To Forget You	A005
S011	Chandelier	A006
S012	Clap Your Hands	A006
S013	She Wolf (Falling To Pieces)	A006
S014	Titanium	A006
S015	Wild Ones	A006

6. The process I followed in creating the database including the following. Firstly, I created tables about each entity in the list. In Table 5.1, the artist table includes the artist ID and artist name which gives information regarding the artist. Also, Table 5.2 gives information about the song like the song ID and song title. Then, I created the related database by inserting the primary key, artist ID, into song table as a foreign key.

7. The **primary keys** are artist ID in Table 5.1 and song ID in Table 5.2 and Table 5.3 while the **foreign key** is artist ID in Table 5.3

8. There are no composite keys in the tables created.

9. Referential integrity constraint is a key factor introduced when a foreign key is used. It specifies that the values of a foreign key must be present in the primary key and the DBMS enforces them. In Table 5.3, the ArtistID is the foreign key and it ensures the value is in Table 5.1 ArtistID as the primary key. Therefore, it prevents errors that could arise when a wrong value is entered as a foreign key in Table 5.3 by disallowing such values.

10. The anomalies that exist in the list can be defined as **modification problems**. These are the issues that arise when **inserting, updating and deleting values** in a list. The anomalies in the list can be explained as follows;

- I. The customer's name Ferguson's with customer number 356, is repeated twice in two rows for the same 21610 order number. However, the part number, part description, quoted price and warehouse for each order are different while the rep number is the same. The discrepancies can lead to confusion. Because the order numbers are the same, it can be implied that the part details should be the same and the reason for the difference might be because the representative who took the order made an error in **updating** the list. Alternatively, it could be customer name Ferguson's with customer number 356 that made both orders on the same day but the representative failed to **change** the order number. The problem is because the unique identifier for the customer's name and the order number are the same for different parts.
- II. Similarly, customer number 608, Johnson's Department Store is repeated three times. Twice with the same order number and once with different order number. We can conclude that Johnson's Department store made an order for part number KV29 because of the unique order number 21623 however order number 21617 was repeated twice. This could mean order number 21617 is the same for the two times it occurred and the representative made an **error** in the part details, quoted price or it could be that the orders are completely different and the representative should have **inserted** and given them different order names.

11. The 8 characteristics of relations are as follows;

- I. Each row of the table holds data that pertain to some entity or a portion of some entity. In Table 5.3, the song ID S001 represents 'Louder Than Words' and was sang artist ID A001, David Guetta.
- II. Each column of the table contains data that represent an attribute of the entity. The SongID column only has identification number to represent each song.
- III. The cells of the table must hold a single value, and thus no repeating elements are allowed in a cell. For example, in Table 5.3, in the SongID column, only S001 is permitted in that cell and cannot written twice in that cell.
- IV. All the entries in any column must be of the same kind i.e all the entries in the SongTitle column must only be songs and not song id or artist id.
- V. Each column must have a unique name. No two column title names must be the same.
- VI. The order of the table within the column is unimportant. The SongTitle column can come before ArtistID and no issue will arise.
- VII. The order of rows is also unimportant. In Table 5.3, the S005 row can come before S001 and there will be no significant problem in the relation.
- VIII. No two identical rows with the same set of values must exist in the relation. The set of data values in each row must be unique which means no two rows in the table may hold identical sets of data values.

12. The different types of keys that are used in database are;

a. Composite Key

Composite key is a key that contains two or more attribute. It can be a combination of Stu_Name and Class_Title which can be unique when there are no two students with the same name taking the same class. Composite key can be unique or nonunique.

b. Candidate Key

Candidate key is a single key or a group of multiple keys that uniquely identify rows in a table or relation. They can be single-column keys or composite keys. They are keys that are candidates to be used as a primary key.

c. Primary Key

Primary key is the candidate key chosen to uniquely identify each row in a relation. To function properly, a primary key whether it is a single column key or a composite key must have unique data values inserted into every row of the table. In Table 5.1, the ArtistID is the primary key.

d. Surrogate Key

Surrogate key is a sequential unique number generated by the database itself. The purpose of a surrogate key is to act as the primary key. There is a slight difference between a surrogate key and a primary key. Ideally, every row has both a primary Key and a surrogate Key. The primary key identifies the unique row in the database while the surrogate key identifies a unique entity in the model. Surrogate keys are short and numeric and never change and are the ideal primary key.

e. Foreign Key

When we place the primary key values from one relation into a second relation to represent a relationship, the attribute in the second relation that holds these values is referred to as a foreign key. It is important when using foreign keys to look for an associated referential integrity constraint.

Part II



1.

```
1  select publishername
2  from publisher
3  where city = 'Boston' ;
```

Results Explain Describe Saved SQL History

PUBLISHERNAME
Berkley Publishing
Course Technology

2 rows returned in 0.03 seconds [Download](#)

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Fig. 1 Publisher name query

"PUBLISHERNAME"

"Berkley Publishing"

"Course Technology"

The name of each publisher located in Boston is

- a. Berkley Publishing
- b. Course Technology

2.

```
1 select bookcode, title, price
2 from book
3 where price between 20 and 30 ;
```



Results	Explain	Describe	Saved SQL	History
BOOKCODE		TITLE		PRICE
0378		Venice		24.5
079X		Second Wind		24.95
1382		Treasure Chests		24.46
2281		Van Gogh and Gauguin		21
4 rows returned in 0.04 seconds		Download		
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Fig. 2 Book code, title and price query

"BOOKCODE","TITLE","PRICE"

"0378","Venice","24.5"

"079X","Second Wind","24.95"

"1382","Treasure Chests","24.46"

"2281","Van Gogh and Gauguin","21"

3.

```

1  select bookcode, title, (price*0.9) AS DISCOUNTED_PRICE
2  from book;

```

BOOKCODE	TITLE	DISCOUNTED_PRICE
0180	A Deepness in the Sky	6.471
0189	Magic Terror	7.191
0200	The Stranger	7.2
0378	Venice	22.05
079X	Second Wind	22.455
0808	The Edge	6.291
1351	Dreamcatcher: A Novel	17.64

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Fig. 3 Book code, title and discounted price query

"BOOKCODE","TITLE","DISCOUNTED_PRICE"

"0180","A Deepness in the Sky","6.471"

"0189","Magic Terror","7.191"

"0200","The Stranger","7.2"

"0378","Venice","22.05"

"079X","Second Wind","22.455"

"0808","The Edge","6.291"

"1351","Dreamcatcher: A Novel","17.64"

"1382","Treasure Chests","22.014"

"138X","Beloved","11.655"

"2226","Harry Potter and the Prisoner of Azkaban","12.564"

"2281","Van Gogh and Gauguin","18.9"

"2766", "Of Mice and Men", "6.255"
"2908", "Electric Light", "12.6"
"3350", "Group: Six People in Search of a Life", "9.36"
"3743", "Nine Stories", "5.391"
"3906", "The Soul of a New Machine", "10.044"
"5163", "Travels with varchar2ley", "7.155"
"5790", "Catch-22", "10.8"
"6128", "Jazz", "11.655"
"6328", "Band of Brothers", "8.64"
"669X", "A Guide to SQL", "34.155"
"6908", "Franny and Zooey", "5.391"
"7405", "East of Eden", "11.655"
"7443", "Harry Potter and the Goblet of Fire", "16.344"
"7559", "The Fall", "7.2"
"8092", "Godel, Escher, Bach", "12.6"
"8720", "When Rabbit Howls", "5.661"
"9611", "Black House", "16.929"
"9627", "Song of Solomon", "12.6"
"9701", "The Grapes of Wrath", "11.7"
"9882", "Slay Ride", "6.291"
"9883", "The Catcher in the Rye", "5.391"
"9931", "To Kill a Mockingbird", "16.2"

4.

```
1 select count(*) as NumberOfSFIbooks
2 from book
3 where type = 'SFI';
```

Results Explain Describe Saved SQL History

NUMBEROFSFIBOOKS
3

1 rows returned in 0.03 seconds [Download](#)



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Fig. 4 Number of SFI book type.

"NUMBEROFSFIBOOKS"

"3"

The number of books with the type SFL is 3.

[illegible][illegible]

6.

```
1 select bookcode, title, publisher.publishercode, publishername
2 from book, publisher
3 where publisher.publishercode = book.publishercode;
```

Results	Explain	Describe	Saved SQL	History
BOOKCODE	TITLE	PUBLISHERCODE	PUBLISHERNAME	
0180	A Deepness in the Sky	TB	Tor Books	
0189	Magic Terror	FA	Fawcett Books	
0200	The Stranger	VB	Vintage Books	
0378	Venice	SS	Simon and Schuster	
079X	Second Wind	PU	Putnam Publishing Group	
0808	The Edge	JP	Jove Publications	


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Fig. 6 Book code, title, publisher code and publisher name query

"BOOKCODE","TITLE","PUBLISHERCODE","PUBLISHERNAME"

"0180","A Deepness in the Sky","TB","Tor Books"

"0189","Magic Terror","FA","Fawcett Books"

"0200","The Stranger","VB","Vintage Books"

"0378","Venice","SS","Simon and Schuster"

"079X","Second Wind","PU","Putnam Publishing Group"

"0808","The Edge","JP","Jove Publications"

"1351","Dreamcatcher: A Novel","SC","Scribner"

"1382","Treasure Chests","TA","Taunton Press"

"138X","Beloved","PL","Plume"

"2226","Harry Potter and the Prisoner of Azkaban","ST","Scholastic Trade"

"2281","Van Gogh and Gauguin","WP","Westview Press"

"2766", "Of Mice and Men", "PE", "Penguin USA"

"2908", "Electric Light", "FS", "Farrar Straus and Giroux"

"3350", "Group: Six People in Search of a Life", "BP", "Berkley Publishing"

"3743", "Nine Stories", "LB", "Lb Books"

"3906", "The Soul of a New Machine", "BY", "Back Bay Books"

"5163", "Travels with varchar2ley", "PE", "Penguin USA"

"5790", "Catch-22", "SC", "Scribner"

"6128", "Jazz", "PL", "Plume"

"6328", "Band of Brothers", "TO", "Touchstone Books"

"669X", "A Guide to SQL", "CT", "Course Technology"

"6908", "Franny and Zooey", "LB", "Lb Books"

"7405", "East of Eden", "PE", "Penguin USA"

"7443", "Harry Potter and the Goblet of Fire", "ST", "Scholastic Trade"

"7559", "The Fall", "VB", "Vintage Books"

"8092", "Godel, Escher, Bach", "BA", "Basic Books"

"8720", "When Rabbit Howls", "JP", "Jove Publications"

"9611", "Black House", "RH", "Random House"

"9627", "Song of Solomon", "PL", "Plume"

"9701", "The Grapes of Wrath", "PE", "Penguin USA"

"9882", "Slay Ride", "JP", "Jove Publications"

"9883", "The Catcher in the Rye", "LB", "Lb Books"

"9931", "To Kill a Mockingbird", "HC", "HarperCollins Publishers"

7.

```
1 select bookcode, title, price
2 from book, publisher
3 where publisher.publishercode=book.publishercode
4 and publishername like 'Plume';
```

Results Explain Describe Saved SQL History		
BOOKCODE	TITLE	PRICE
138X	Beloved	12.95
6128	Jazz	12.95
9627	Song of Solomon	14
3 rows returned in 0.00 seconds Download		
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Fig. 7 Book code, title and price query.

"BOOKCODE","TITLE","PRICE"

"138X","Beloved","12.95"



"6128","Jazz","12.95"

"9627","Song of Solomon","14"

8.

```
1 select bookcode, title, price
2 from book, publisher
3 where publisher.publishercode=book.publishercode
4 and publishername like 'Plume'
5 and price < 14;
```

Results Explain Describe Saved SQL History		
BOOKCODE	TITLE	PRICE
138X	Beloved	12.95
6128	Jazz	12.95
2 rows returned in 0.01 seconds Download		

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Fig. 8 Book code, title and price query

"BOOKCODE","TITLE","PRICE"

"138X","Beloved","12.95"

"6128","Jazz","12.95"



9.

```
1 select title
2 from book, publisher
3 where publisher.publishercode=book.publishercode
4 and type = 'PSY'
5 and publishername = 'Jove Publications';
```

Results Explain Describe Saved SQL History

TITLE
When Rabbit Howls

1 rows returned in 0.01 seconds [Download](#)

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Fig. 9 Title of book with type PSY and Jove Publications has publisher

"TITLE"

"When Rabbit Howls"



10.

```
1 select bookcode, title
2 from book, publisher
3 where publisher.publishercode=book.publishercode
4 and price > 10
5 and city = 'Boston';
```

Results Explain Describe Saved SQL History

BOOKCODE	TITLE
3350	Group: Six People in Search of a Life
669X	A Guide to SQL

2 rows returned in 0.01 seconds [Download](#)

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Fig. 10 Book code and title query

"BOOKCODE","TITLE"

"3350","Group: Six People in Search of a Life"

"669X","A Guide to SQL"