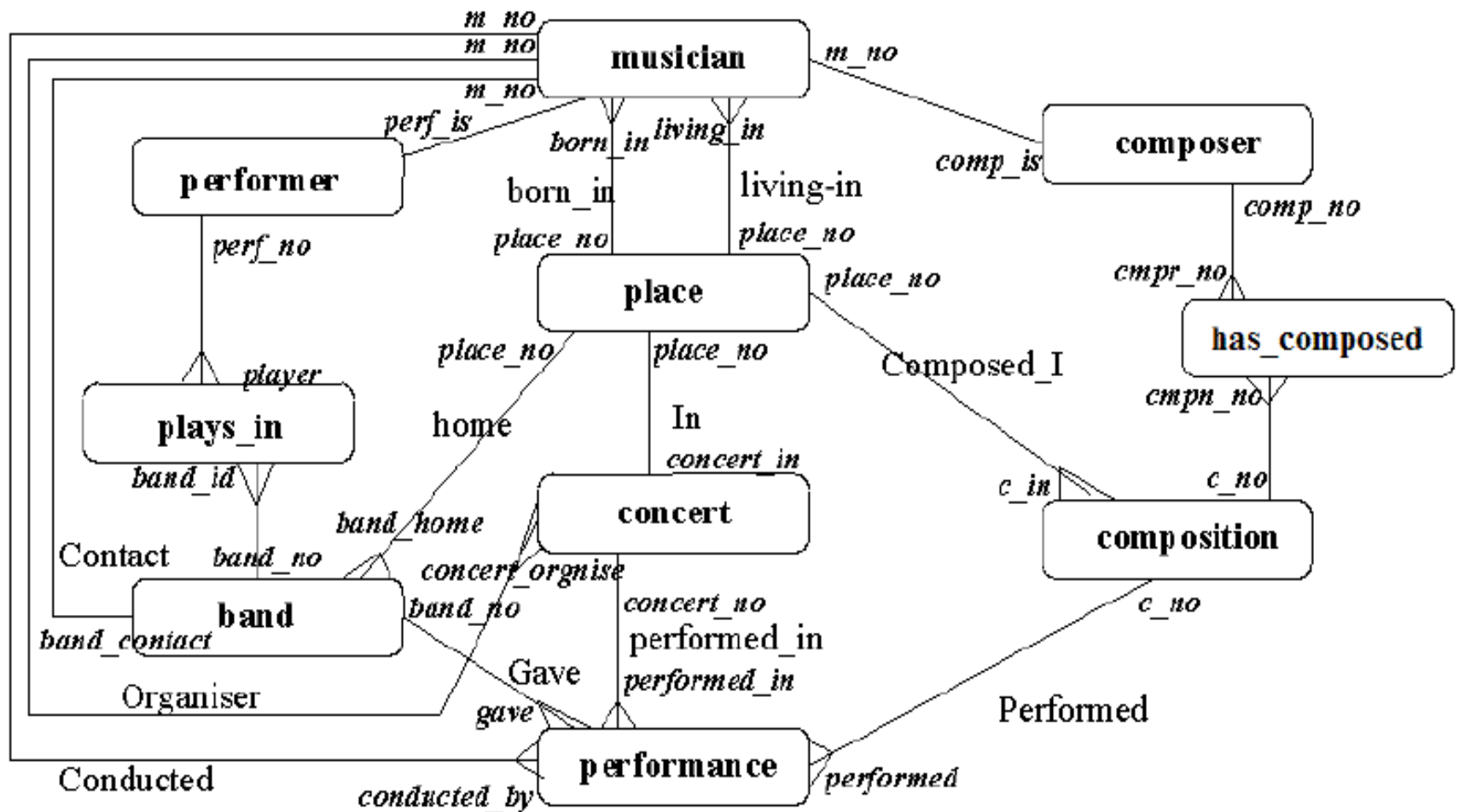# E/R Diagrams

TUTORIAL 7

DBMS 2013-2014 Fall

Nagehan Ilhan

E/R Diagram

Musicians Database Table

band (**band_no**, **band_name**, *band_home, band_type, b_date, band_contact*)

composer (**comp_no**, *comp_is, comp_type)*

composition (**c_no**, **comp_date**, **c_title**, *c_in)*

concert (**concert_no**, **concert_venue**, *concert_in, con_date, concert_orgniser)*

has_composed (*cmpr_no, cmpn_no)*

musician (**m_no**, **m_name**, **born**, **died**, *born_in, living_in)*

performance (*pfrmnc_no, gave, performed, conducted_by, performed_in)*

performer (**perf_no**, *perf_is, instrument, perf_type)*
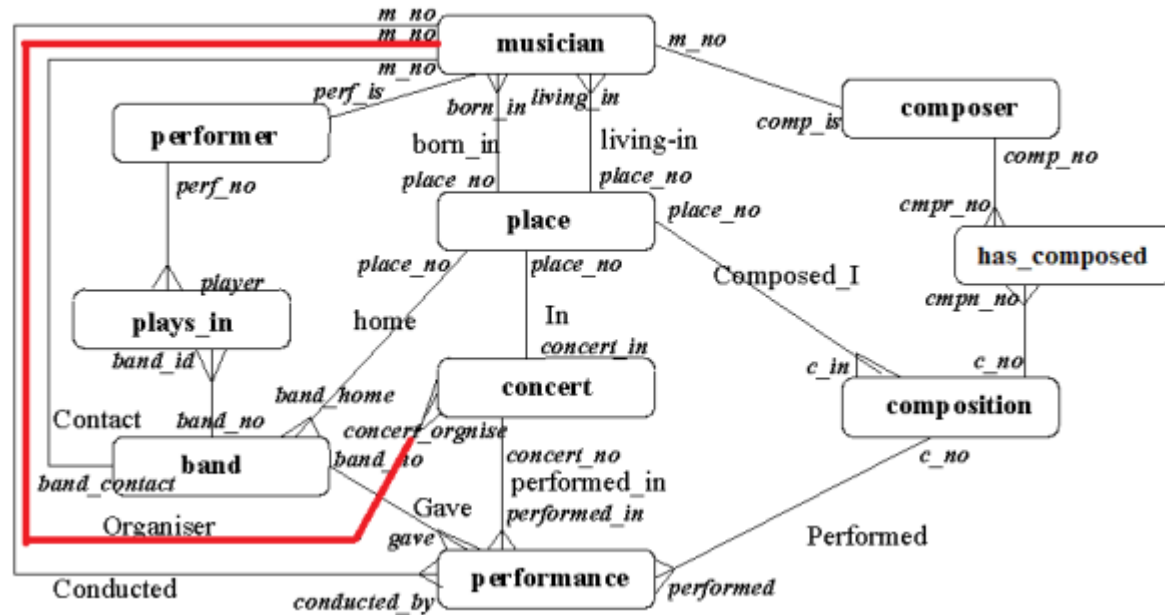
place (**place_no**, **place_town**, **place_country**)

plays_in (*player, band_id)*

Sample Table Rows

select * from musician	m_no	m_name	born	died	born_in	living_in
	1	Fred Bloggs	02/01/48		1	2

select * from place	place_no	place_town	place_country
	1	Manchester	England

select * from performer	perf_no	perf_is	instrument	perf_type
	1	2	violin	classical

select * from composer	comp_no	comp_is	comp_type
	1	1	jazz

select * from band	band_no	band_name	band_home	band_type	b_date	band_contact
	1	ROP	5	classical	30/01/01	11

select * from plays_in	player	band_id
	1	1

select * from composition	c_no	comp_date	c_title	c_in
	1	17/06/75	Opus 1	1

select * from has_composed	cmpr_no	cmpn_no
	1	1

select * from concert	concert_no	concert_venue	concert_in	con_date	concert_orgniser
	1	Bridgewater Hall	1	06/01/95	21

select * from performance	pfrmnc_no	gave	performed	conducted_by	performed_in
	1	1	1	21	1

SQL Queries

1- Give the organiser's name of the concert in the Assembly Rooms after the first of Feb, 1997.

Query1-Solution1

- musician (**m_no**, **m_name**, **born, died, *born_in, living_in*)**
- concert (**concert_no, concert_venue, *concert_in, con_date, concert_orgniser*)**

SELECT m_name FROM concert JOIN musician
ON (concert.concert_orgniser= musician.m_no)
WHERE concert_venue = "Assembly Rooms"
AND
con_date >"1997-02-01"

m_name
James Steeple

Query1-Solution2

SELECT m_name FROM musician
WHERE m_no = (SELECT concert_orgniser FROM
concert WHERE concert_venue = 'Assembly
Rooms' AND con_date>'1997-02-01')

Query1-Solution3

SELECT m_name FROM musician,
(SELECT concert_orgniser AS orgId FROM concert WHERE concert_venue='Assembly Rooms' AND con_date >'1997-02-01') AS conOrg WHERE m_no = orgId
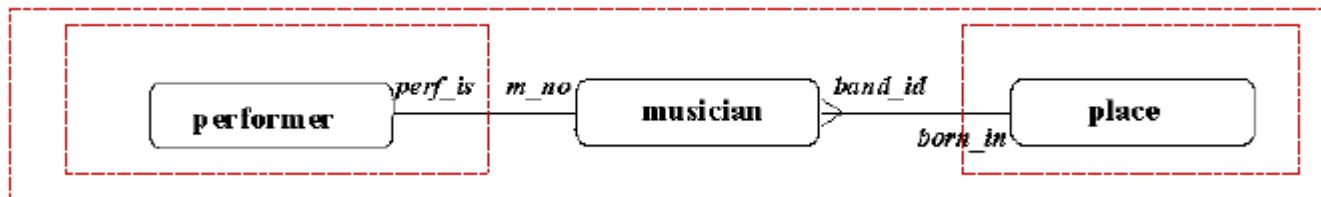
Query2

2- Find all the performers who played guitar or violin and were born in England.

performer (**perf_no,** *perf_is, instrument, perf_type)*

musician (**m_no, m_name, born, died,** *born_in, living_in)*

place (**place_no, place_town, place_country)**

Query2-Solution1

SELECT m_name FROM performer, musician, place
WHERE musician.born_in = place.place_no AND
performer.perf_is = musician.m_no AND
place.place_country = "England" AND
(instrument = "guitar" OR instrument = "violin")

m_name
Harry Forte
Davis Heavan
Alan Fluff
Theo Mengel
James First
Harriet Smithson

Query2-Solution2

SELECT m_name FROM musician,

(SELECT perf_is FROM performer WHERE
instrument='violin' OR instrument='guitar') AS perfTable,

(SELECT place_no FROM place WHERE
place_country='England') AS placeTable

WHERE m_no=perf_is AND place_no=born_in

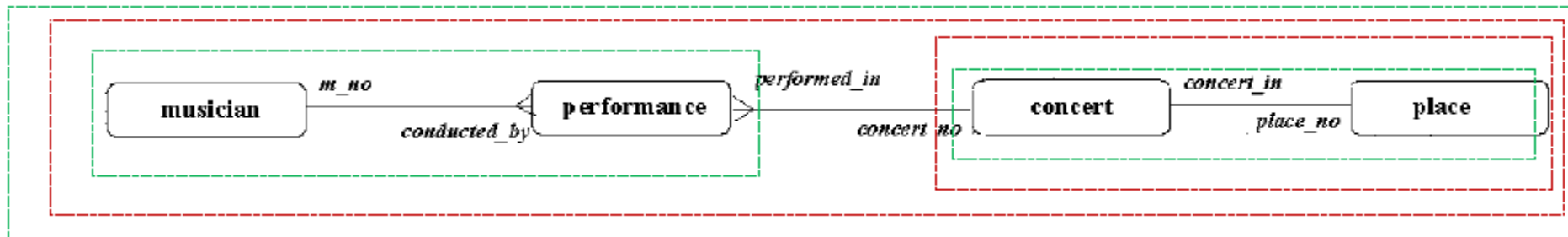| perf_is |
|---------|
| 2 |
| 8 |
| 12 |
| 14 |
| 6 |
| 10 |
| 18 |
| 5 |
| 4 |

place_no
1
5
7

Query 3

3- List the names of musicians who have conducted concerts in USA together with the towns and dates of these concerts.

musician (**m_no**, **m_name**, **born**, **died**, *born_in*, *living_in*)
performance (*pfrmnc_no*, *gave*, *performed*, *conducted_by*, *performed_in*)
concert (**concert_no**, **concert_venue**, *concert_in*, *con_date*, *concert_orgniser*)
place (**place_no**, **place_town**, **place_country**)

Query3-Solution1

SELECT DISTINCT m_name,place_town,con_date FROM musician, concert, place, performance
WHERE place.place_country = "USA" AND
concert.concert_no = performance.performed_in AND
performance.conducted_by = musician.m_no AND
concert.concert_in = place.place_no
GROUP BY m_name

m_name	place_town	con_date
James Steeple	New York	1997-06-15
James Steeple	New York	1997-06-15
James Steeple	New York	1997-06-15
James Steeple	New York	1997-06-15

Correct:

m_name	place_town	con_date
James Steeple	New York	1997-06-15

Place_country="USA" olan place_no'lar 4 ve 8. 4 numaralı place_no'da 8 numaralı konser yapılıyor. 8 numaralı konserde ise 4 tane performans sergileniyor. Bu nedenle distinct ve group by demeden 4 adet sonucumuz var.

Query3-Solution2

SELECT m_name,conPlace.con_date,conPlace.pTown FROM

(SELECT DISTINCT performed_in,m_name FROM musician,performance WHERE m_no=conducted_by) AS musnPerf,

(SELECT concert_no,con_date,placeTable.place_town AS pTown FROM concert,(SELECT place_no,place_town FROM place WHERE place_country='USA') AS placeTable WHERE concert_in=place_no) AS conPlace
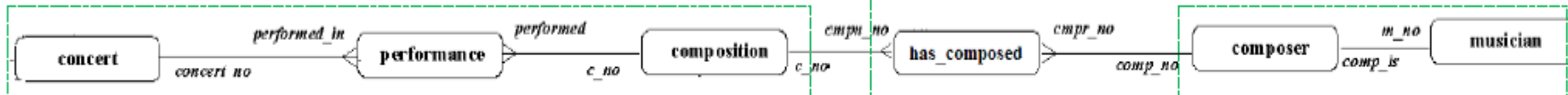
WHERE conPlace.concert_no = musnPerf.performed_in

1	James Steeple
2	Fred Bloggs
2	James Steeple
3	Jeff Dawn
3	Phil Hot
4	Jeff Dawn
4	Rose Spring
5	Lovely Time
6	Alan Fluff
7	Tony Smythe
8	James Steeple

concert_no	con_date	pTown
8	1997-06-15 00:00:00.000	New York

Query4

4- How many concerts have featured at least one composition by Andy Jones? List concert date, venue and the composition's title.

Query4-Solution1

SELECT con_date, concert_venue, c_title , COUNT(*)
FROM concert, performance, composition, has_composed, composer,musician
WHERE m_name = "Andy Jones" AND
concert.concert_no = performance.performed_in AND
performance.performed = composition.c_no AND
composition.c_no = has_composed.cmpn_no AND
has_composed.cmpr_no = composer.comp_no AND
composer.comp_is = musician.m_no

con_date	concert_venue	c_title	COUNT(*)
1997-06-15	Metropolitan	A Simple Piece	1

Query4-Solution2
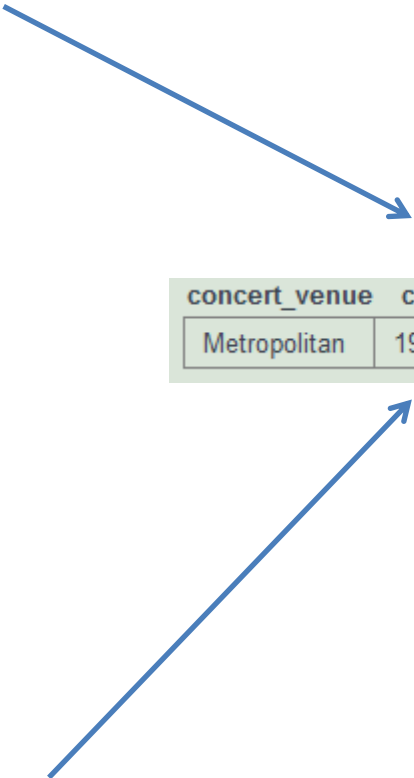
SELECT conCompTable.concert_venue, conCompTable.con_date,
conCompTable.c_title, COUNT(*) AS num_of_Conc FROM

(SELECT concert_venue,con_date,c_title,c_no FROM
(SELECT concert_venue,con_date,concert_no FROM concert) AS concertTable ,
composition, performance WHERE
performed_in = concertTable.concert_no AND performed=c_no) AS conCompTable
,
(SELECT cmpn_no FROM has_composed,
(SELECT comp_no FROM musician,composer WHERE m_name='Andy Jones' AND
m_no=comp_is) AS ajCompTable
WHERE cmpr_no = ajCompTable.comp_no) AS ajCmpnTable
WHERE

ajCmpnTable.cmpn_no = conCompTable.c_no

Query4-Solution2

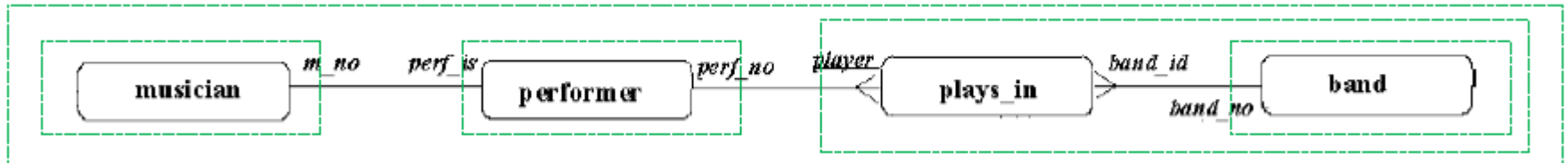| concert_venue	con_date	c_title	c_no
Bridgewater Hall	1995-01-06 00:00:00.000	Opus 1	1
Bridgewater Hall	1995-01-06 00:00:00.000	Valiant Knight	3
Bridgewater Hall	1995-01-06 00:00:00.000	Simple Song	5
Bridgewater Hall	1996-05-08 00:00:00.000	Here Goes	2
Bridgewater Hall	1996-05-08 00:00:00.000	Little Piece	4

concert_venue	con_date	c_title	num_of_Conc
Metropolitan	1997-06-15	A Simple Piece	1

cmpn_no
17

Query 5

5- List the names of musicians in a descending alphabetic order together with their instruments in the band 'Somebody Loves this'.

Query5-Solution1

SELECT m_name,instrument FROM musician, performer, plays_in, band
WHERE band.band_name = "Somebody Loves this" AND
musician.m_no = performer.perf_is AND
performer.perf_no = plays_in.player AND
plays_in.band_id= band.band_no
ORDER BY m_name DESC

m_name	instrument
Jeff Dawn	bass
Harry Forte	clarinet

Query5-Solution2

SELECT m_name,instrument FROM musician,performer,
(SELECT player FROM plays_in WHERE band_id=
(SELECT band_no FROM band WHERE band_name='Somebody Loves
this'))AS playerTable
WHERE m_no = perf_is AND perf_no = playerTable.player
ORDER BY m_name DESC

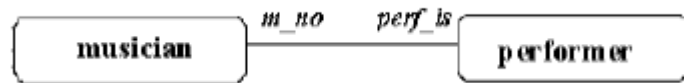| player |
|--------|
| 26 |
| 27 |

musician (**m_no**, m_name, born, died, *born_in, living_in*)

performer (**perf_no**, *perf_is, instrument, perf_type*)

plays_in (*player, band_id*)

 band (band_no, band_name, *band_home, band_type, b_date,*
    band_contact)

Query 6

6- List the names, dates of birth and the instrument played of living musicians who play a instrument which Theo Mengel also plays.

musician — *m_no* — *perf_is* — performer

Query6-Solution1

SELECT m_name, born, instrument FROM musician, performer
WHERE died IS NULL AND
  musician.m_no = performer.perf_is AND
instrument = ANY (SELECT instrument FROM musician, performer WHERE m_name =
"Theo Mengel" AND m_no = perf_is)
ORDER BY instrument DESC

instrument
banjo
violin
drums

m_name	born	instrument
John Smith	1950-03-03	violin
Harry Forte	1951-02-28	violin
Theo Mengel	1948-08-12	violin
James First	1965-06-10	violin
Jeff Dawn	1945-12-12	violin
Harry Forte	1951-02-28	drums
Theo Mengel	1948-08-12	drums
Theo Mengel	1948-08-12	banjo

Query6-Solution2

SELECT m_name, born, instrument FROM musician, performer,
   (SELECT instrument AS theoInstruments FROM musician, performer
WHERE m_name = "Theo Mengel" AND m_no = perf_is) AS tInst
 WHERE died IS NULL AND
musician.m_no = performer.perf_is AND
instrument = tInst.theoInstruments
ORDER BY instrument DESC

Query 7

7- List the name and the number of players for the band whose number of players is greater than the average number of players in each band.

band (band_no, band_name, *band_home, band_type, b_date, band_contact*)

plays_in (*player, band_id*)

Query7-Solution

SELECT band_name, c.CountNum FROM band,
(
SELECT band_id AS ID, a.b AS CountNum FROM
(
SELECT band_id, COUNT(*) AS b FROM plays_in
GROUP BY band_id
) AS a
WHERE a.b >
    // Average Code
    SELECT AVG (eachBandNumOfPlayers.numOfPlayers)
    FROM (
    SELECT COUNT (*) AS numOfPlayers FROM plays_in
    GROUP BY band_id
) AS eachBandNumOfPlayers
GROUP BY band_id
)
) AS c
WHERE band.band_no = ID

band_name	CountNum
ROP	7
AASO	7
Oh well	6

Query7-Explanation

-------------------------EXPLANATION---

❖ Number of players in each band:

SELECT band_id, **COUNT(*) FROM** plays_in
   GROUP BY band_id

band_id	COUNT(*)
1	7
2	7
3	2
4	3
5	1
6	2
7	6
8	3

❖   Their average:
SELECT AVG (eachBandNumOfPlayers.numOfPlayers)
FROM (
 SELECT COUNT (*) AS numOfPlayers **FROM** plays_in
  GROUP BY band_id
) **AS** eachBandNumOfPlayers

AVG (eachBandNumOfPlayers.numOfPlayers)
3.8750

❖   Select band_id s higher than avg:

SELECT band_id, a.b **FROM**
(
 SELECT band_id, **COUNT(*) AS** b **FROM** plays_in
  GROUP BY band_id
) **AS** a
 WHERE a.b >
...// Average Code

 GROUP BY band_id
)

Query7-Explanation

❖ Then, cross this result with band table to retrieve related band's names. ! Keep COUNT value!

```
SELECT band_name, c.CountNum FROM band,
(
SELECT band_id AS ID , a.b AS CountNum FROM
  (
  SELECT band_id, COUNT( * ) as b FROM plays_in
  GROUP BY band_id
  ) AS a
  WHERE a.b
  ...// Average Code

  GROUP BY band_id
  )
) AS c
WHERE band.band_no = ID
```

Exercises:

8. List the names of musicians who both conduct and compose and live in Britain.

9. Show the least commonly played instrument and the number of musicians who play it.

10. List the bands that have played music composed by Sue Little; Give the titles of the composition in each case

Reference

- http://sqlzoo.net/wiki/Musicians