

## Database Problems 2

### Relational Algebra

There follows a set of tables representing information about a group of musicians and their work. Musicians may be composers, performers, managers of ensembles and/or conductors but each is identified by a unique musician number. Some musicians also have performer numbers. Compositions and ensembles are identified by unique numbers too.

MUSICIANS

<u>MNO</u>	<u>SURNAME</u>	<u>DOB</u>	<u>HOME</u>
M1	Aybeesky	9/6/1941	Wyland
M2	Beeseesky	11/12/1818	Zedland
M3	Seedeesky	4/4/1898	Exland
M4	Aybeesky	12/6/1936	Wyland
M5	Ayefsky	19/9/1951	Zedland
M6	Beedeesky	25/10/1902	Teeland
M7	Ayseesky	4/11/1947	Wyland
M8	Seedeesky	4/4/1898	Teeland
M9	Deebeesky	30/1/1954	Wyland

COMPOSITIONS (where MNO identifies the **Composer**)

<u>CNO</u>	<u>TITLE</u>	<u>MNO</u>	<u>PUBLISHED</u>
C1	Elpiece	M5	5/6/1993
C2	Emtune	M9	8/11/1995
C3	Kaysong	M3	20/1/1934
C4	Aichtune	M5	29/9/1984
C5	Elpiece	M3	30/5/1929
C6	Kaysong	M5	4/12/1982

ENSEMBLES (where MNO identifies the **Manager**)

<u>ENO</u>	<u>NAME</u>	<u>BASE</u>	<u>MNO</u>
E1	The Ays	Exland	M7
E2	The Bees	Exland	M5
M3	The Cees	Teeland	M7
E4	The Ays	Zedland	M4
E5	The Dees	Exland	M5
E6	The Efs	Exland	M5
E7	The Bees	Zedland	M4

PERFORMANCES (where MNO identifies the **Conductor**)

<b>CNO</b>	<b>DATE</b>	<b>TOWN</b>	<b>COUNTRY</b>	<b>MNO</b>	<b>ENO</b>
C5	5/3/1997	Teeton	Teeland	M9	E3
C1	15/6/1997	Arby	Exland	M1	E6
C5	22/6/1998	Eston	Exland	M9	E5
C3	22/6/1997	Esfield	Exland	M1	E1
C5	3/7/1996	Eston	Teeland	M9	E5
C6	5/7/1997	Arby	Zedland	M7	E4
C1	11/7/1998	Teeby	Exland	M1	E1
C4	19/7/1998	Arton	Wyland	M4	E2

PERFORMERS (where MNO identifies the **Performer**)

<b>PNO</b>	<b>MNO</b>	<b>INSTRUMENT</b>	<b>GRADE</b>	<b>YEARS</b>
P1	M1	Saxophone	Good	2
P2	M1	Flute	Average	13
P3	M1	Piano	Awful	20
P4	M4	Trumpet	Good	10
P5	M5	Violin	Good	9
P6	M5	Viola	Weak	1
P8	M9	Saxophone	Awful	2
P9	M7	Piano	Average	7

## ENSEMBLE MEMBERS

<b>ENO</b>	<b>PNO</b>
E1	P5
E1	P8
E1	P9
E2	P5
E2	P3
E3	P9
E4	P4
E4	P1
E4	P8
E5	P5
E5	P9
E6	P1
E6	P8
E7	P3
E7	P5

Translate the following questions into relational algebra expressions.

1. In which towns in Exland have there been performances?
2. Give the musician numbers of all saxophone players.
3. Give the surnames of all saxophone players.
4. Give the surname of the manager of every ensemble that includes a saxophone.
5. Give the ensemble number of every ensemble that includes a saxophone and a clarinet.
6. Give the ensemble number of every ensemble that includes a saxophone but not a clarinet.
7. Which musicians are not composers?
8. Which musicians have composed a piece called "Kaysong" and a piece entitled "Elpiece"?
9. Which musicians come from "Wyland" or have composed a piece called "Kaysong"?