

## Database Problems 4

### Relational Calculus

Using the usual files

MUSICIANS ( MNO, SURNAME, DOB, HOME )

COMPOSITIONS ( CNO, TITLE, MNO, PUBLISHED )  
where MNO identifies the composer

ENSEMBLES ( ENO, NAME, BASE, MNO )  
where MNO identifies the manager

PERFORMANCES ( CNO, DATE, TOWN, COUNTRY, MNO, ENO )  
where MNO identifies the conductor

PERFORMERS ( PNO, MNO, INSTRUMENT, GRADE, YEARS )  
where MNO identifies the performer as a musician

ENSEMBLE MEMBERS ( ENO, PNO )

Translate the following questions into relational calculus expressions.

1. Which musicians were born before 1/1/1900?
2. What is the title and composer's surname of every piece composed before 1/1/1930?
3. What are the surnames of the composers?
4. Who plays in "The Efs"?
5. On what dates have there been performances which were either in Wyland or by "The Efs"?
6. Who has conducted every ensemble?