CO526 Databases Course Work 3: Advanced SQL

Due in 12noon Thursday 25th February 2016

Background Material

The tables below gives details of a **family_history** database. In the person table, people are identified by their name, and always have their gender, date of birth (dob) and place of birth (born_in) recorded. In addition, each person may optionally have recorded the name of their father, and the name of their mother. If the person has died, then the date of death dod must be present. Note that only a fragment of the data held in the database is listed below.

person						
name	gender	dob	dod?	father?	mother?	born_in
Alice	F	1885-02-25	1969-12-05	null	null	Windsor
Andrew	M	1960-02-19	null	Philip	Elizabeth II	London
Andrew of Greece	M	1882-02-02	1944-12-03	George I of Greece	null	Athens
Anne (Princess)	F	1950-08-15	null	Philip	Elizabeth II	London
Charles	M	1948-11-14	null	Philip	Elizabeth II	London
⋮						

person(father) $\stackrel{fk}{\Rightarrow}$ person(name) person(mother) $\stackrel{fk}{\Rightarrow}$ person(name)

In addition, there is a table monarch which contains the English head of state — normally a monarch (*i.e.* a King or Queen) — where the house of each monarch indicates which royal house the monarch belongs to, accession indicates the date the person came to the throne, and coronation the date any coronation of the monarch. If null appears in coronation then the person had no coronation. Each monarch remains head of state until the succession of the next monarch. Note that the value of null appearing in house indicates *not* a King or Queen, but a head of state (for example Oliver Cromwell) who filled the role of Protector during the Commonwealth period in the 17th Centuary.

monarch			
name	house?	accession	coronation?
James I	Stuart	1603-03-24	1603-07-25
Charles I	Stuart	1625-03-27	1626-02-02
Oliver Cromwell	null	1649-01-30	null
Richard Cromwell	null	1658-09-03	null
Charles II	Stuart	1659-05-25	1626-02-02
James II	Stuart	1685-02-06	1685-04-23
⋮			

monarch(name) $\stackrel{fk}{\Rightarrow}$ person(name)

Finally, there is a table prime_minister, recording the party the person led whilst Prime Minister, and the date of entry into office. A person remains Prime Minister until the date of entry to office of the next Prime Minister. Note a person may have more than one period in office.

prime_minister		
name	party	entry
David Cameron	Conservative	2010-05-11
Gordon Brown	Labour	2007-06-27
Tony Blair	Labour	1997-05-02
John Major	Conservative	1990-11-28
Margaret Thatcher	Conservative	1979-05-04
James Callaghan	Labour	1976-04-05
Harold Wilson	Labour	1974-03-04
Edward Heath	Conservative	1970-06-19
⋮		

prime_minister(name) $\overset{fk}{\Rightarrow}$ person(name)

Submission

To gain full marks, answers to the following questions should make full use of ANSI SQL commands to write compact and efficient queries, and be laid out such that structure of the query is clear. The queries must also run correctly on the DoC Postgres version of the database, and be submitted electronically to CATE as single batch file db_2016_cw3.sql by the coursework deadline. A template version of the file is available on CATE for download. The queries in the file must be given in the order of the questions below, and be separated by semi-colons.

To test your answer against the Postgres version of the database, you should run the command:

```
psql -h db.doc.ic.ac.uk -d family_history -U lab -W -f db_2016_cw3.sql
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Note that 60% of the marks will be awarded for correctness, and 40% of the marks for style, including how consise the queries are, appropriate use of indentation, use of Capital letters for keywords, and exprsssing join conditions by use of JOIN statements in the FROM clause as opposed to using equals in the WHERE clause.

Questions

1. Write an SQL query that returns the scheme (first_name) ordered by first_name listing all first names in the database. A first name is taken to mean the first word appearing the name column of person.
2. Write an SQL query that returns the scheme (born_in,popularity) ordered by popularity,born_in listing places of birth, and the number of occurances of places of birth. The most popular place of birth must be listed first.
3. Write an SQL query that returns the scheme (house,seventeenth,eighteenth,nineteenth,twentieth) ordered by house listing the number of monarchs of each royal house that acceeded to the throne in the 17th, 18th, 19th and 20th centuries.
4. Write an SQL query that returns the scheme (name,age) ordered by name containing the name of all parents, and their age (in years) when they had their first child.
5. Write an SQL query returning the scheme (father,child,born) ordered by father,born that lists as father the name of all men in the database, together with the name of each child, with born being the number of the child of the father (*i.e.* returning 1 for the first born, 2 for the second born, *etc*). For men with no children, the man should be listed with null for both child and born.

6. Write an SQL query that returns the scheme (monarch,prime_minister), ordered by monarch and prime minister, that of lists prime ministers that held office during the reign of the monarch.