Middle East Technical University   Department of Computer Engineering

CENG 351
Data Management & File Structures
Fall 2020–2021
In Class Activity 3 — SQL LAB

1   Specifications

IMPORTANT NOTE
SQLite does not support ANY/ALL.
SQLite returns year (INT) as result of (Date - Date) operation. If you have two dates (ex. birthday and datedied) you can use Date2 - Date1 to find the age of that person.
Your answers should **not include** duplicate rows (You may use DISTINCT if needed, however do not eliminate useful data by using DISTINCT).

You are given the following database schema:

Kingdom(<u>kingdomID</u>, kingdomName)
King (<u>kingID</u>, kingName, kingdomID, dateCrowned, dateDied)
War (<u>warID</u>, kingdomID1, kingdomID2, dateOfWar, winnerID)
Alliance (<u>kingID1, kingID2</u>, duration)
Heir (<u>kingID, heirName</u>, birthDate, diedAt, ruled)

Assume that this database includes the kingdoms of Game of Thrones. The data may not represent the actual story of the books/series. The properties of the relations are given below:

Kingdom : The table that stores kingdoms. There are two attributes: the kingdomId(INT) and kingdomName(TEXT).

King : The table that stores kings.

- kingID (INT): id of that king.
- kingName (TEXT): name of the king.
- kingdomID (INT): the kingdom that the king ruled. (References Country)
- dateCrowned (DATE): the date that the king started ruling. (Once a king is crowned he rules until he dies)
- dateDied (DATE): the date of the king died.

War : The table that stores the wars occured between the kingdoms.

- warID (INT): id of that war.
- kingdomID1 (INT) and kingdomID2 (INT): The kingdoms that took part in the war. These values are interchangeable. Which means the table includes **only one of** the symmetric instances. If there is a war between the kingdom 1 and 2, only (1,2) will appear (or (2,1)), not both combinations. (Each of the attributes References Kingdom)
- dateOfWar (DATE): date of the war.
- winnerID (INT): winner of the war. It is either of kingdom1 or kingdom2. (References Kingdom)

Alliance : The table that stores alliances.

- kingID1(INT), kingID2(INT): the kings who signed the alliance. (each references King)
- duration (INT): duration of the alliance.

Heir : The table that stores information about heirs.

- kingID (INT): father of the heir who is a King (References King).
- heirName (TEXT): name of the heir. It is globally unique only together with the kingID.
- birthDate (DATE), diedAt (DATE): the dates on which the heir is born and died.
- ruled (Boolean): Boolean value (0 or 1) indicates that the heir was throned or not.

2 Questions

Q1 (10pts). Find all the kings who ruled the kingdom named "Kingdom of the Mountain and the Vale" more than 20 years. List the name of the king, date crowned and the number of his heirs (Ascending order by the name of the king.)

Q2 (15pts). Find all the kings of "Kingdom of the North" who had an ally and has no heirs. List the names of the kings and the duration of their reign. (Descending order by the name of the king).

Q3 (15pts). Find all the kings who had an Alliance with some king of "Principality of Dorne" and such that the duration of the alliance is more than 5 years. List the name of the king, the name of his ally (the king of "Principality of Dorne") and duration of the alliance.(Ascending order by duration of alliance)

Q4 (20pts). Find all the kings who had an Alliance with all the kings of "Principality of Dorne". List the names of the kings. (Ascending order by the name of the king)

Q5 (20pts). A heir who is throned (becomes a king) is called as SuccessfulHeir (the 'rules' attribute in Heir table is giving this information). Find the kings who have the highest number of SuccessfulHeirs among all other kings. Note that, there can be more than one king having the highest number of such heirs. List the name of the king, number of his SuccessfulHeirs and the average age of his SuccessfulHeirs. (Ascending order by the name of the king).
Hint: You should check the attribute 'ruled' in the Heirs table. The heir does not have to appear in the King table.

Q6 (20pts). Find all the kings who won every single war they fought. Note that the kings do not participate any war should not be included in the result. List the name, date crowned and the name of the country he rule. (Ascending order by the name of the king.)