

CSCI 3901 Final Project
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Milestone 3 - External documentation of data structures, code design, key algorithms,
and any additional white box tests.

CRC (Class Responsibility Collaborator):

PersonIdentity	
- Their name - Date and location of birth - Date and location of death - Gender - Occupation - References to source material - Notes on the individual	BiologicalRelation

BiologicalRelation	
- Parent/child relations - Partnering ceremony relations - Partnering dissolutions	PersonIdentity

FileIdentifier	
Filename Date of media creation Location Tags Individuals	PersonIdentity

Classes for the solution:

PersonIdentity:

Methods:

- PersonIdentity addPerson(String name)
- Boolean recordAttributes(PersonIdentity person, Map attributes)
- Boolean recordReference(PersonIdentity person, String reference)
- Boolean recordNote(PersonIdentity person, String note)

BiologicalRealation:

Methods:

- Boolean recordChild(PersonIdentity parent, PersonIdentity child)
- Boolean recordPartnering(PersonIdentity partner1, PersonIdentity partner2)
- Boolean recordDissolution(PersonIdentity partner1, PersonIdentity partner2)

FileIdentifier

Methods:

- FileIdentifier addMediaFile(String fileLocation)
- Boolean recordMediaAttributes(FileIdentifier fileIdentifier, Map attributes)
- Boolean peopleInMedia(FileIdentifier fileIdentifier, List people)
- Boolean tagMedia(FileIdentifier, fileIdentifier, String tag)

Genealogy

Methods:

- PersonIdentity findPerson(String name)
- FileIdentifier findMediaFile(String name)
- String findName(PersonIdentity id)
- String findMediaFile(FileIdentifier fileId)
- BiologicalRelation findRelation(PersonIdentity person1, PesonIdentity person2)
- Set descendents(PersonIdentity person, Integer generations)
- Set ancestores(PersonIdentity person, Integer generations)
- List notesAndReferences(PersonIdentity person)
- Set findMediaByTag(String tag , String startDate, String endDate)
- Set findMediaByLocation(String location, String startDate, String endDate)
- List findIndividualsMedia(Set people, String startDate, String endDate)
- List findBiologicalFamilyMedia(PersonIdentity person)

ER diagram for the solution

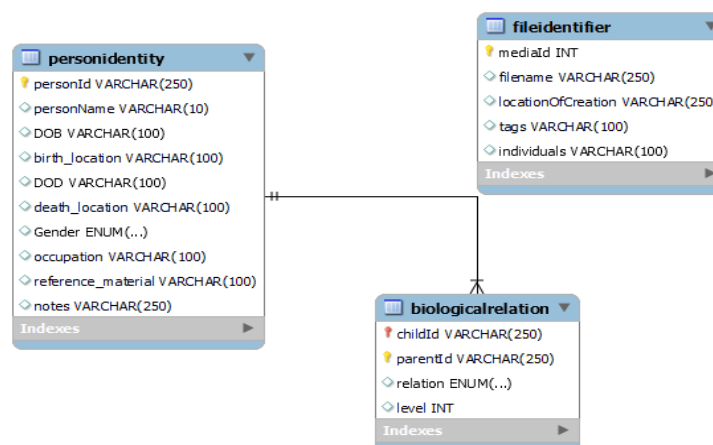


Fig. 1 ER diagram for the genealogy problem

Key algorithm with example:

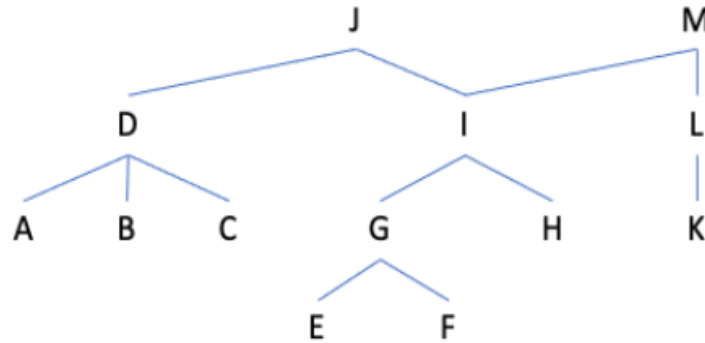


Fig. 2 Family tree for the problem

For above family tree here, the data will be store in the database in the following order.

Let's assume in the begging database is empty, now user added person "J" into the database using addPerson method. In this manner user added all the family members into the table but still there is no relation added into the table. All the data for person is stored into the personIdentity table. Now let's say, user added parent child relation between the person "A" and person "D". so now in the row will be added into biologicalRelation table where parentId will be person D's personId and the childId will be A's personId and for relation and level field it will be "parent" and 1 respectively. Now in the next step, system will ittrate throught all the ancestors of parents of person A, and it will add the data for it into the biologicalRelation table. For example, all the ancestors of G will be store in the biological as described below.

Table 1: result of rows for common ancestors

childId	parentId	relation	Level
1 <personId for G>	2 <personId for I>	Parent	1
2 <personId for I>	3 <personId for J>	parent	2
3 <personId for I>	4 <personId for M>	parent	2
5 <personId for A>	6 <personId for D>	Parent	1
6 <personId for D>	3 <personId for J>	Parent	2

So now to find the relation between person G and person A. first extract all the rows of childId of G with parent relation and store it into the map where the key is parentId of the row and the value will be the level of the parent. Now for finding the relation between two members in we have levels of each member so cousinship will be the smaller level minus one and difference between two levels will be the level of separation.

Data Structure

For storing the levels of the members, system uses the map data structure where personId is the key and value will be the level of the member to the common ancestor.

For storing the objects for the personIdentity for findPerson, system will store the all objects in the list.

WhiteBox testing

- Date of birth attribute in the map is greater than current date
- Date of death attribute in the map is less than date of birth
- If the parent and child objects are the same in recordChild() method
- If the person is married and recordpartnering() is called
- If the person is dissolved and recordDissolution() is called