

High-level breakdown analysis

Inputs to the program:

Operation	Context/Entity	Inputs
Create/Update	Person	Name
		Date of birth
		Gender
		Occupation
		References
		Notes
	Adding relationships	Person 1(parent)
		Person 2(child)
	Partnering/Dissolution	Person 1(partner1)
		Person 2(partner2)
	Media	File location
		Year
		Date
		City
	Associating media with individuals	Media identifier
		List of individuals
	Tagging media	Media identifier
		Tag
Retrieval	Individual	Person name
	Media	Media name
	Individual name	personID
	Media file	fileID
	Relation	Person 1
		Person 2
	Descendants	Person
		Generations
	Ancestors	Person
		Generations
	Notes and References	Person
	Media	Tag
		Start date
		End date
	Media	Location
		Start date
		End date
	Individuals media	People
		Start date
		End date
	Biological family media	Person

Transformations to the data:

1. Date of birth can be converted from a string to the Date data type.
2. Gender can be converted from a string to the character data type.

Data processed right away:

1. Answer as soon as the input is given for the retrieval.

Data to keep longer:

Following entities could be stored in a database:

1. Person(person_id, name)
2. PersonAttribute(person_id, date_of_birth, gender, occupation)
3. Note(person_id, note)
4. Reference(person_id, reference)
5. Partner(person_id_1, person_id_2)
6. ParentChild(parent_id, child_id)
7. Media(media_id, fileLocation)
8. MediaAttribute(media_id, year, date, city)
9. PeopleMedia(media_id, person_id)
10. Tag(media_id, tag)

Output of the program:

1. Person's information
2. Media information(Tag/Location)
3. Notes and references of an individual
4. Ancestors/Descendants of an individual
5. Relationship between two individuals
6. Media associated with an individual's immediate children

Assumptions:

1. Only biological relations can exist in the family tree.
2. When a partner relationship exists and a child gets recorded for one of the partners, then the second partner also records this automatically due to symmetry.
3. The symmetry between partners gets broken after the dissolution. i.e child recorded for one of the partners does not automatically record it for the previous partner.
4. An individual cannot be added again at a different location in the family tree.

Constraints:

1. Biological family relations
2. English genealogy perspective

Strange cases:

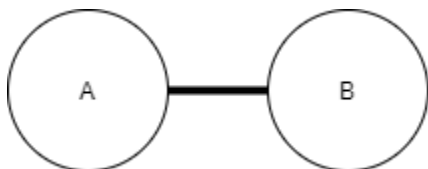
1. When an individual is disconnected from the main tree
2. The case when dissolution happens and a child gets recorded to one of the partners

Approach:

1. Create two databases
 - a. FamilyTree: Storing family relationships, Individual's information
 - b. MediaManagement: Storing media metadata, tags
2. Create tables in the FamilyTree database:
 - a. Person(person_id, name)
 - b. PersonAttribute(person_id, date_of_birth, gender, occupation)
 - c. Note(person_id, note)
 - d. Reference(person_id, reference)
 - e. Partner(person_id_1, person_id_2)
 - f. ParentChild(parent_id, child_id)
3. Create tables in the MediaManagement database:
 - a. Media(media_id, fileLocation)
 - b. MediaAttribute(media_id, year, date, city)
 - c. PeopleMedia(media_id, person_id)
 - d. Tag(media_id, tag)
4. Create a tree data structure by querying the database to build a family tree.
5. Maintain individuals' information in a map for quick access.
6. Navigate the tree to do different operations such as finding the lowest common ancestor, finding ancestors/descendants.

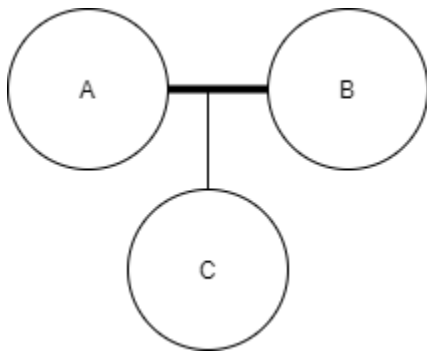
Building a family tree:

1. Partnering: A, B



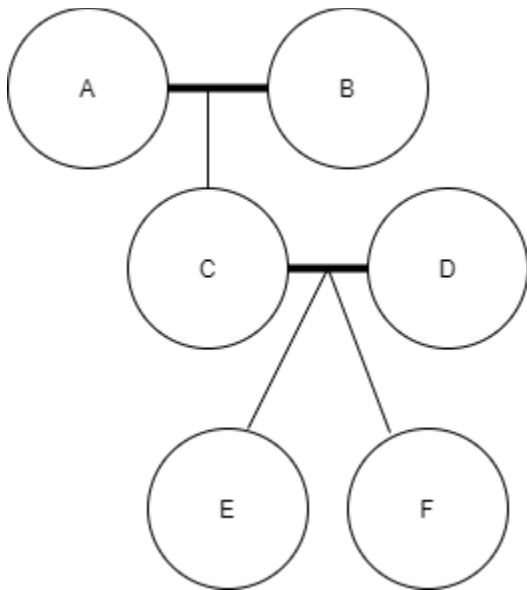
2. Adding child: C

Since A and B are partners(Symmetric). The child C gets recorded for both A and B



3. Partnering: C, D.

Recording children: E, F(D)



4. Dissolution: C, D

Partnering: D, G

Adding child: H(D)

Since C and D are no longer partners and D and G are new partners, the child H when recorded for D gets added only to D and G. Not C.

