



Marmara University

Faculty of Engineering

Computer Engineering

CSE 2260

Principles of Programming Languages

PROJECT II

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1. Introduction

This project is a family tree management system developed using Prolog. It provides functionality for adding a person into the family tree, updating person information, printing the family tree, printing detailed information about a person, finding relationships between people for all types of connections, and adding marriages. This project helped us better understand how Prolog's logic works while managing family information.

2. Running the Code

To run the program, open the terminal in the directory where the file is located and start SWI-Prolog by typing "swipl filename.pl". After the Prolog environment loads, type "start." to launch the main menu.

3. Calculating Age, Alive/Dead Status, and Tree Level

The age calculation is performed using the `get_age/3` rule. The age is calculated based on the birth year and death year, or returns 'Unknown'. If the birth year is a number and the death year is 'none': $\text{Age} = 2025 - \text{birth year}$

If the death year is a number: $\text{Age} = \text{death year} - \text{birth year}$

If the information is missing or incorrect: $\text{Age} = \text{'Unknown'}$

`is_alive/1` checks whether a person is alive by looking at their year of death. If the year of death is none or greater than 2025, the person is considered alive; otherwise, they are considered deceased.

If the person is a root person (e.g., 'Murat Aslan' or 'Sedanur Aslan'), their level is 0. If the person has a father or mother, first the parent's level is found, and then 1 is added.

In other words, a person's level is one more than their parent's level. If the person is married to someone, they are considered to be at the same level as their spouse.

`level_list/1`: Groups all people according to their generation (level) in the family tree.

`group_levels/2`: Collects people who are at the same level together.

`same_level/4`: Adds all people at the same level into a list.

4. Adding and Updating a Person in the Family Tree

This section provides functions that allow individuals to be added and updated in a family tree system. The system maintains data integrity by taking into account an individual's parental relationships and provides the user with controls to prevent incorrect data entry.

The main functionality begins with the *add_update_person* rule, which prompts the user with two options: add a new person or update an existing one. Based on the user's choice, the system executes either the *add_person* or *update_person* rule.

The *add_person* rule collects all necessary information from the user to register a new individual in the system. Before proceeding, it verifies whether the specified parents already exist and are married. If this condition is not met, the addition process is aborted.

The system prompts the user for the person's name, year of birth, year of death (or "none" if still alive), and gender. Once the year of birth is entered, the system checks that it matches the birth and death years of the specified mother and father using the *checkForMother* and *checkForFather* rules. If they do not match, the user is asked for the year of birth again. In the code, *checkForFather* is used inside *checkForMother*. The *checkForDeathYear* rule verifies that the year of death is after the year of birth. If all validations pass, the person is added to the system using the person structure. The mother's and father's children lists are also updated, establishing a bidirectional relationship between the individual and their parents.

Through the *update_person* rule, users are given the option to change the birth or death year of an existing individual or to cancel the update entirely. Birth year updates must not contradict the current death year and must be logically consistent with the parents' birth and death years. Additionally, the updated birth year must not be later than the birth years of the person's children. These conditions are checked using the *checkParents* and *checkChildren* rules.

The *checkParents* predicate is responsible for verifying each parent of a person individually. If a parent exists, it calls the *check_parent(Parent, ChildBirthYear)* predicate to perform the necessary validations. If the person has no recorded parent, the predicate is instead called as *check_parent(none, _)*, skipping the checks for that parent.

The `checkChildren` predicate is responsible for ensuring that a person's new birth year does not overlap with the birth years of their children. It uses the recursive `check_children_birth_years/2` predicate. The base case, `check_children_birth_years([], _)`, handles the case where a person has no children, ensuring that the check passes immediately. The recursive case, `check_children_birth_years([Child|Rest], NewBirthYear)`, verifies that the birth year for each child in the list is after the proposed new birth year. This approach ensures temporal consistency within the family structure.

The death year update must be greater than the birth year. Also, the death year must be after the birth years of all the individual's children. The comparison with the birth years of the children is checked with the `checkDeathAfterChildren` rule. If the person is still alive, the user can continue without death information by entering "none". These operations are managed using the `update_death_year` rule.

In cases of invalid entries, the system provides descriptive feedback and allows the user to re-enter the information. This makes the system user-friendly.

5. Determining Relationships Between Individuals

This section of the system is responsible for identifying the familial relationship between two individuals based on predefined logical rules. When the user inputs two full names, the system checks them against a series of Prolog predicates such as `anne/2`, `baba/2`, `amca/2` and others to determine how they are related. If a valid relationship is found, it is displayed to the user; otherwise, a default message is shown indicating that no known relationship exists between the given names.

6. Printing the Family Tree

The family tree is printed using the `print_tree/0` rule. This rule first groups all individuals according to their generation levels by calling `level_list(Levels)`. After grouping, it prints each generation and the individuals in that generation using the `print_levels` rule.

Within each level, the `print_couples/3` rule is used to display the names of individuals. If a person is married and their spouse has not yet been printed, the rule prints both

names together as a couple. If the person is either unmarried or their spouse has already been printed, only that person's name is shown. To avoid printing the same person multiple times, a list called Seen keeps track of already printed individuals.

The print_levels/1 rule handles the printing of each generation level along with the names of people in that group, ensuring that the structure of the family tree is clearly represented.

7. Marriage Validity Control

During the marriage process, the system prompts the user to provide the names of two individuals and the intended date of marriage. If either of these individuals is not already registered in the system, their birth date and, if applicable, death date are requested, and the person is added to the database.

Once the individuals are recorded, the system checks whether either of them is already married. It does not allow duplicate or polygamous marriages. It then verifies if both individuals were alive on the date of marriage. If one is deceased, the system ensures that the marriage date precedes their date of death; otherwise, the marriage is not permitted.

The system calculates the age of both individuals at the time of marriage. If either individual is under 18 years old, the marriage is considered invalid and rejected. Additionally, if a person being added to the system is under 18, they are not registered as a person in the system. Furthermore, the system only allows marriages between individuals of opposite genders. If both individuals are of the same gender, the marriage is not recorded.

Finally, the system checks for any prohibited familial relationships between the individuals. Marriages between siblings, parents and children, or similarly close relatives are disallowed. If all conditions are satisfied, the marriage is added to the database. Otherwise, the system displays an appropriate error message and returns the user to the main menu.

8. Completed and Incomplete Parts

In this project, family relationships were modeled in a detailed and structured way. Various types of relationships such as mother, father, son, daughter, sibling, uncle, aunt (from both maternal and paternal sides), cousin, niece, nephew, brother-in-law, sister-in-law, mother-in-law, father-in-law, bride, groom, and similar were clearly defined in the system.

Within the scope of person management, functions were developed to add and update individuals. These functions automatically check the logical consistency between birth and death years to prevent incorrect data entry.

The marriage registration system was designed with several important rules:

- Individuals under the age of 18 are not allowed to marry.
- Deceased individuals cannot be added to a marriage.
- The system only permits marriages between individuals of opposite genders (male-female)
- A person cannot have children after their recorded death year.
- Forbidden relationships (such as parent-child, siblings, uncle/aunt with niece/nephew) are detected, and proper error messages are shown in order of priority.

Additionally, a relationship query function was implemented. This feature allows users to check the family connection between any two people in the system. It also displays personal details such as age, number of children, marital status, and whether the person is alive. The date of marriage is also included, as it is considered an important detail.

As a result, all required features were successfully implemented, and the project was completed without any missing parts.

9. Execution Screenshots

```
1 ?- start.  
  
Main Menu:  
1. Ask relation  
ny person  
4. Print the family tree  
5. Add marriage  
6. Terminate program  
  
Please choose an operation (1-6): 4.  
---LEVEL 0---  
Murat Aslan-Sedanur Aslan
```

```
Main Menu:  
1. Ask relation  
2. Add/update person  
3. Get information of any person  
4. Print the family tree  
5. Add marriage  
6. Terminate program  
  
Please choose an operation (1-6): |: 3.  
Please type the person name and surname:  
|: 'Murat Aslan'.  
Level: 0  
Age: 85  
Total child: 0  
Alive
```


Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): 2.

1-) Add person

2-) Update person

Please choose an option:

|: 1.

Please enter the father name and surname:

|: 'Murat Aslan'.

Please enter the mother name and surname:

|: 'Sedanur Aslan'.

Please enter the name and surname of the person:

|: 'Busenaz Aslan'.

Please enter the birth year:

|: 1962.

Please enter the death year (or none if alive):

|: 'none'.

Please enter the gender (m/f):

|: f.

Person added successfully.

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Busenaz Aslan
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 3.
Please type the person name and surname:
|: 'Murat Aslan'.
Level: 0
Age: 85
Total child: 1
Alive
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Busenaz Aslan'.
Name of second person
|: 'Faruk Kaya'.
Date of marriage
|: 1985.
Please type the birth date of SECOND person.
|: 1960.
Please type the death date of SECOND person.
|: 'none'.
Please type the gender of SECOND person.
|: m.
Marriage added successfully.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Busenaz Aslan-Faruk Kaya
```

```
Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 1.
Please enter the father name and surname:
|: 'Faruk Kaya'.
Please enter the mother name and surname:
|: 'Busenaz Aslan'.
Please enter the name and surname of the person:
|: 'Gamze Kaya'.
Please enter the birth year:
|: 1989.
Please enter the death year (or none if alive):
|: 'none'.
Please enter the gender (m/f):
|: f.
Person added successfully.

Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Busenaz Aslan-Faruk Kaya

---LEVEL 2---
Gamze Kaya
```

```
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Ahmet Aslan
Busenaz Aslan-Faruk Kaya

---LEVEL 2---
Gamze Kaya

Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Ahmet Aslan'.
Name of second person
|: 'Mehtap Duman'.
Date of marriage
|: 1988.
Please type the birth date of SECOND person.
|: 1968.
Please type the death date of SECOND person.
|: 'none'.
Please type the gender of SECOND person.
|: f.
Marriage added successfully.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Yunus Aslan'.
Name of second person
|: 'Gamze Kaya'.
Date of marriage
|: 2010.
Marriage added successfully.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Ahmet Aslan-Mehtap Duman
Busenaz Aslan-Faruk Kaya

---LEVEL 2---
Gamze Kaya-Yunus Aslan
```

Whole Family

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Ahmet Aslan-Mehtap Duman
Busenaz Aslan-Faruk Kaya
Emre Yılmaz-Zeynep Aslan
Mehmet Aslan-Sevda Yıldız

---LEVEL 2---
Büşra Yılmaz
Gamze Kaya-Yunus Aslan

---LEVEL 3---
Selin Aslan
```

Relationships

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Murat Aslan'.
kari-koca
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Faruk Kaya'.
Please type the second person s name and surname
|: 'Busenaz Aslan'.
koca-kari
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Zeynep Aslan'.
anne
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Murat Aslan'.
Please type the second person s name and surname
|: 'Mehmet Aslan'.
baba
```



```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Mehmet Aslan'.
Please type the second person s name and surname
|: 'Murat Aslan'.
ogul
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Zeynep Aslan'.
Please type the second person s name and surname
|: 'Murat Aslan'.
kiz
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Busenaz Aslan'.
Please type the second person s name and surname
|: 'Ahmet Aslan'.
abla
```

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Ahmet Aslan'.

Please type the second person s name and surname

|: 'Busenaz Aslan'.

erkek kardes

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Ahmet Aslan'.

Please type the second person s name and surname

|: 'Zeynep Aslan'.

abi

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Zeynep Aslan'.

Please type the second person s name and surname

|: 'Ahmet Aslan'.

kiz kardes

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Mehtap Duman'.

Please type the second person s name and surname

|: 'Murat Aslan'.

gelin

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Faruk Kaya'.

Please type the second person s name and surname

|: 'Sedanur Aslan'.

damat

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Murat Aslan'.

Please type the second person s name and surname

|: 'Mehtap Duman'.

kayinpeder

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Mehtap Duman'.
kayinvalide
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Gamze Kaya'.
Please type the second person s name and surname
|: 'Mehmet Aslan'.
yegen
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Mehmet Aslan'.
Please type the second person s name and surname
|: 'Yunus Aslan'.
amca
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Zeynep Aslan'.
Please type the second person s name and surname
|: 'Gamze Kaya'.
teyze
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Zeynep Aslan'.
Please type the second person s name and surname
|: 'Yunus Aslan'.
hala
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Ahmet Aslan'.
Please type the second person s name and surname
|: 'Gamze Kaya'.
dayi
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Yunus Aslan'.
babaanne
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Murat Aslan'.
Please type the second person s name and surname
|: 'Gamze Kaya'.
dede
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Gamze Kaya'.
anneanne
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Yunus Aslan'.
Please type the second person s name and surname
|: 'Sedanur Aslan'.
torun
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Gamze Kaya'.
Please type the second person s name and surname
|: 'Yunus Aslan'.
kuzen
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Mehtap Duman'.
Please type the second person s name and surname
|: 'Mehmet Aslan'.
yenge
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Faruk Kaya'.
Please type the second person s name and surname
|: 'Mehmet Aslan'.
eniste
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Emre Yılmaz'.
Please type the second person s name and surname
|: 'Faruk Kaya'.
bacanak
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Ahmet Aslan'.
Please type the second person s name and surname
|: 'Faruk Kaya'.
kayinbirader
```


Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Busenaz Aslan'.

Please type the second person s name and surname

|: 'Emre Yılmaz'.

baldiz

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Zeynep Aslan'.

Please type the second person s name and surname

|: 'Mehtap Duman'.

gorumce

Main Menu:

1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.

Please type the first person s name and surname

|: 'Sevda Yıldız'.

Please type the second person s name and surname

|: 'Mehtap Duman'.

elti

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Selin Aslan'.
ata
```

Invalid cases

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 1.
Please type the first person s name and surname
|: 'Sedanur Aslan'.
Please type the second person s name and surname
|: 'Invalid Name'.
No known relationship found between the given names.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): 2.
1-) Add person
2-) Update person
Please choose an option:
|: 1.
Please enter the father name and surname:
|: 'Invalid Name'.
Father not found. Please add the father first.
Invalid choice. Please try again.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 1.
Please enter the father name and surname:
|: 'Murat Aslan'.
Please enter the mother name and surname:
|: 'Invalid Name'.
Mother not found. Please add the mother first.
Invalid choice. Please try again.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 1.
Please enter the father name and surname:
|: 'Murat Aslan'.
Please enter the mother name and surname:
|: 'Sedanur Aslan'.
Please enter the name and surname of the person:
|: 'Ahmet Aslan'.
Please enter the birth year:
|: 1800.
Birth year cannot be before the mother's birth year. Try again.
Please enter the birth year:
|: 2000.
Please enter the death year (or none if alive):
|: 1950.
Death year cannot be before the birth year. Try again.
|: 2082.
Please enter the gender (male/female):
|: m.
Person added successfully.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 2.
1- Update the birth year
2- Update the death year
3- Cancel
Please choose an option:
|: 1.
Please enter the name and surname of the person:
|: 'Murat Aslan'.
Please enter the new birth year:
|: 2017.
Error: New birth year is not valid with respect to children.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 2.
1- Update the birth year
2- Update the death year
3- Cancel
Please choose an option:
|: 2.
Please enter the name and surname of the person:
|: 'Gamze Kaya'.
Please enter the new death year (or none if alive):
|: 2045.
Death year for Gamze Kaya has been updated to 2045.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 1.
Please enter the father name and surname:
|: 'Yunus Aslan'.
Please enter the mother name and surname:
|: 'Gamze Kaya'.
Please enter the name and surname of the person:
|: 'Ece Aslan'.
Please enter the birth year:
|: 2050.
Birth year cannot be after the mother's death year. Try again.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 2.
1-) Add person
2-) Update person
Please choose an option:
|: 2.
1- Update the birth year
2- Update the death year
3- Cancel
Please choose an option:
|: 2.
Please enter the name and surname of the person:
|: 'Ahmet Aslan'.
Please enter the new death year (or none if alive):
|: 1980.
Error: Death year must be after birth year.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 3.
Please type the person name and surname:
|: 'Invalid Name'.
Person not found.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Büşra Yılmaz'.
Name of second person
|: 'Salih Çelik'.
Date of marriage
|: 1800.
Please type the birth date of SECOND person.
|: 1993.
Error: Salih Çelik is under 18 (Age: -193)! Marriage not allowed.
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Büşra Yılmaz'.
Name of second person
|: 'Mehmet Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: yegen-dayi
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Emre Yılmaz'.
Name of second person
|: 'Büşra Yılmaz'.
Date of marriage
|: 2020.
Invalid Marriage: baba-kiz
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Büşra Yılmaz'.
Name of second person
|: 'Murat Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: dede-torun
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Busenaz Aslan'.
Name of second person
|: 'Ahmet Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: abla-erkek kardes
```



```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Ahmet Aslan'.
Name of second person
|: 'Sedanur Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: ogul-anne
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Yunus Aslan'.
Name of second person
|: 'Zeynep Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: yegen-hala
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): |: 5.
Name of first person
|: 'Zeynep Aslan'.
Name of second person
|: 'Yunus Aslan'.
Date of marriage
|: 2020.
Invalid Marriage: hala-yegen
```

```
Main Menu:
1. Ask relation
2. Add/update person
3. Get information of any person
4. Print the family tree
5. Add marriage
6. Terminate program

Please choose an operation (1-6): 5.
Name of first person
|: 'Murat Aslan'.
Name of second person
|: 'Sedanur Aslan'.
Date of marriage
|: 1961.
They are already married with each other.
```