

## CSE2260 - Principles of Programming Languages

### PROJECT II (Due 26/05/2024 23:59)

In this project, you will implement the software described below using **Prolog** programming language. The details of the user interface (UI) are left for you to design.

A family tree warehouse application (FTWA): creates and manages family trees. FTWA keeps a track of the ancestral hierarchy of the user's family.

There exist several rules that each group should implement:

- Users should be able to add new members to the family tree and update people in family tree.
- Maintaining only one family tree is enough.
- Each person should keep at least the following information: gender [male, female], name [string], surname [string], birth date [date], death date [date], father [one person], mother [one person], children [zero or more child]
- Users should be able to add any person as child. Any other relationship is prohibited while entering. So, you should be able to calculate relationships when asked by the user.
- Users should be able to reach the following information: alive or dead, age, the level in the family tree. Your program will calculate this information when asked by the user.
- Users should be able to ask the relationship between 2 people.
- The application should display the tree as meaningful diagram (i.e. printing to console is enough), when asked. The diagram should be informative enough.
- The application should display the relationship types in Turkish. The following types should be supported.
  - Anne, Baba, Oğul, Kız, Erkek Kardeş, Kız Kardeş, Abla, Abi
  - Amca, Hala, Dayı, Teyze
  - Yeğen, Kuzen
  - Enişte, Yenge
  - Kayınvalide, Kayınpeder, Gelin, Damat
  - Bacanak, Baldız, Elti, Kayınbirader
- No need for a fancy UI for the application. You can use console for getting input and displaying the tree
- Anyone can marry with anyone in the family tree except father, mother, sibling, uncle, aunt and grandparents. If a marriage violates this rule, your program should warn the user and reject the marriage.
- Birth and death dates should be realistic. For instance, a person cannot have a child after he/she dies. The application should not allow non-realistic birth and death dates and should warn the user.
- The application should give warnings when any of the spouse is below 18 years old. The program should warn the user and reject the marriage if any of the spouse is below 18 years old.

Assumptions:

- You can assume that there will not be two people having both the same name and surname.
- Only the husband and wife at the root of the family tree can be hardcoded. All other family members will be added by the user while the program is running.

- You can assume that update operation will be performed for just the birthdate and death date. You can assume that update operation will not affect the previously successfully completed operations. But the operations after the update will be done according to the updated data.

Submission rules:

- 1.You should submit the project through canvas.
- 2.This project is a group project. You are going to work in groups of **3 people**. Only the group representative will upload the project.
- 3.You will submit the source code and the report as a single .zip file.The name of the zip file should be studentnumber1\_studentnumber2\_studentnumber3.zip
- 4.In the report you should provide the information listed below:

**0.How to run your code.**

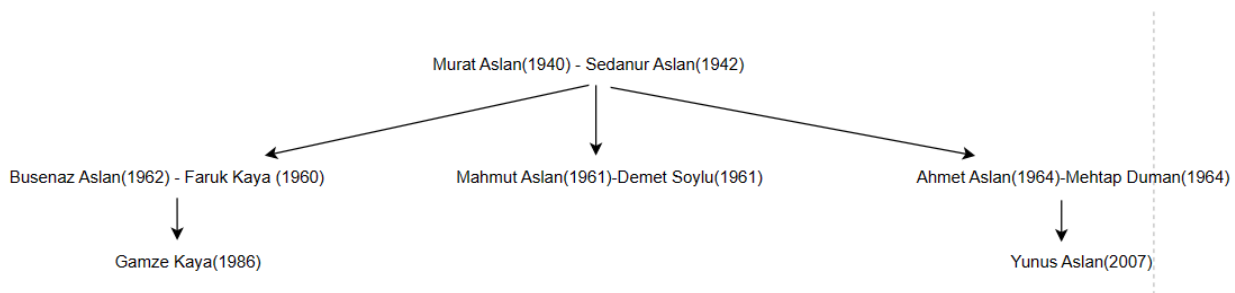
- 1.How you create the tree and the brief explanation of the related code.
- 2.How you add a new person into the tree and the brief explanation of the related code.
- 3.How you perform the update operation and the brief explanation of the related code.
- 4.How you calculate whether a person is alive or dead, his/her age and his/her corresponding level in the family tree and the brief explanation of the related code.
- 5.How you find the relationships between people and the brief explanation of the related code.
- 6.How you print the family tree and the brief explanation of the related code.
- 7.How you control the marriage validity (both for invalid relationship types and being under 18 years old) and the brief explanation of the related code.

**8.Complete/incomplete parts and the parts that are not working as supposed to be.**

**9.Execution screenshots for:**

- i.adding person into the family tree.
- ii.updating person information.
- iii.printing the family tree.
- iv.printing the information about a person.
- v.finding relationships between people (for all types of relationships).
- vi.adding marriage.

Sample Run: You can find the construction and some operations for the tree given below:



1. initial state of the tree.

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan
```

2.printing information about a person

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 3.
please type the person name and surname:
| 'Murat Aslan'.
Age:84
Level=0
Total child: 0
Alive
```

3.adding a person into the tree.

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 2.
1-)Add person
2-)Update person
Please choose an operation!
| 1.
please type the father name and surname:
| 'Murat Aslan'.
please type the mother name and surname:
| 'Sedanur Aslan'.
please type the child name and surname:
| 'Busenaz Aslan'.
please type the birthdate of the child:
| 1962.
please type the death date of the child:
| 'none'.
please type the child person gender:
| f.
```

4.updated tree after adding a person

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

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



5. after adding a person into the tree the related relationships are also established. Therefore, Murat Aslan has become a father and has a child.

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 3.
please type the person name and surname:
| 'Murat Aslan'.
Age:84
Level=0
Total child: 1
Alive.
```

6. some addition steps are skipped for simplicity. You can find the new state of the tree below that is going to be used for the next illustrations of the execution scenarios.

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Busenaz Aslan-Faruk Kaya
Mahmut Aslan-Demet Soylu
Ahmet Aslan-Mehtap Duman
```

7. asking for relationship between 2 people.

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 1.
please type first person name and surname:
| 'Mahmut Aslan'.
please type second person name and surname:
| 'Busenaz Aslan'.
Abi
```

8. adding a new person

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 2.
1-)Add person
2-)Update person
Please choose an operation!
| 1.
please type the father name and surname:
| 'Faruk Kaya'.
please type the mother name and surname:
| 'Busenaz Aslan'.
please type the child person name and surname:
| 'Gamze Kaya'.
please type the birthdate of the child:
| 1986.
please type the death date of the child:
| 'none'.
please type the child person gender:
| f.
```



## 9. asking for relationship

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 4.
---LEVEL 0---
Murat Aslan-Sedanur Aslan

---LEVEL 1---
Busenaz Aslan-Faruk Kaya
Mahmut Aslan-Demet Soylu
Ahmet Aslan-Mehtap Duman

---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 the program

Please choose an operation!
| 1.
please type first person name and surname:
| 'Mahmut Aslan'.
please type second person name and surname:
| 'Gamze Kaya'.
Dayi
```

## 10. control for validity of marriage

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 5.
name of first person :
| 'Mahmut Aslan'.
name of second person :
| 'Gamze Kaya'.
INVALID MARRIAGE : DAYI-YEGEN
```



## 11. adding another person and checking for validity of marriage

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program
Please choose an operation!
| 2.
1-)Add person
2-)Update person
Please choose an operation!
| 1.
please type the father name and surname:
| 'Ahmet Aslan'.
please type the mother name and surname:
| 'Mehtap Duman'.
please type the child person name and surname:
| 'Yunus Aslan'.
please type the birthdate of the child:
| 2007.
please type the death date of the child:
| 'none'.
please type the child person gender:
| m.
```

```
please type the child person gender:
| m.
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program
Please choose an operation!
| 5.
name of first person :
| 'Yunus Aslan'.
name of second person :
| 'Gamze Kaya'.
Under 18 age marriage!
Invalid Marriage : Yunus Aslan-Gamze Kaya
```



## 12.update operation

```
1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program
Please choose an operation!
| 2.
1-)Add person
2-)Update person
Please choose an operation!
| 2.
1. Update the birth year of someone.
2. Update the death year of someone.
0. Cancel.
Enter your choice : 2.
Enter the name of person that you want to update: |: 'Murat Aslan'.
Enter the new death year: 2006.

1-)Ask relation
2-)Add/Update person
3-)Get information of any person
4-)print the family tree
5-)Add marriage
6-)Terminate the program

Please choose an operation!
| 3.
please type the person name and surname:
| 'Murat Aslan'.
Age:84
Level=0
Total child: 3
Dead.
```