CMPE 160 Project # 5
"Genealogy"

1   Specification

Write a genealogy program that accepts data about the various relations among a set of people and, when requested, prints out information about the relations.

Input
1. The retained family relationship information, generated by the previous execution of this program, is input from file "Family.dat" at the beginning of each execution of the program. This file must be a binary file; you may determine the type of the component records.
2. The user inputs commands, in the format shown below. Names are strings of no more than 10 characters, with no embedded blanks. The program should not be case sensitive (e.g., 'AHMET' and 'Ahmet' are the same name). There may be any number of blanks between command parameters. To simplify the processing, you can assume that names are unique; that is, there are no duplicate names in the family. The commands are discussed in detail in the *Processing* instructions below.

Output
1. Responses to user commands are to be written to the screen, as described in the *Command Processing* instructions below.
2. Echo print each command and show the results of any PRINT commands in a text file called "Family.trn". You may determine the format of the information in this file; it should be labeled and formatted clearly. A hard copy of this file is turned in with your program for grading.
3. File "Family.dat" must be rewritten to contain the updated house information.

Command Processing

Command	*Processing*
MALE <name> EXISTS	<name> is a male, but we know nothing about his parentage.
FEMALE <name> EXISTS	<name> is a female, but we know nothing about her parentage.
<name1> AND <name2> BEGET SON <name3>	<name1> is a male and <name2> is a female. These names have already been defined by an EXISTS or BEGET command. Moreover, <name1> and <name2> should be associated with MARRIES command. <name3> is a male.
<name1> AND <name2 BEGET DAUGHTER <name3>.	<name1> is a male and <name2> is a female. These names have already been defined by an EXISTS or BEGET command. Moreover, <name1> and <name2> should be associated with MARRIES command. <name3> is a female
<name1> MARRIES<name2>	<name1> and <name2> are people of the opposite sex and neither is already married. Either<name1> or <name2> may be the male, however. Both <name1> and <name2> have already been defined by an EXISTS or BEGET command.
PRINT <name>'S <relationship>	All of <name>'s relatives satisfying the given relationship are to be printed in any order. <name> has already been defined by an EXISTS or BEGET command. <Relation> may be any of the

following words: SIBLINGS, SISTERS, BROTHERS, CHILDREN, DAUGHTERS, SONS, PARENTS, GRANDPARENTS, AUNTS, or UNCLES. For simplicity, you do not have to consider relations by marriage; that is, if someone marries your sister, he does not become your brother. If any of the information requested by a PRINT command is not known (i.e., if we are only told AHMET EXISTS and then are asked to PRINT AHMET's FATHER), the phrase "unknown" should be printed. If <name> has no relatives satisfying the specified relation, nothing need be printed. If you are unfamiliar with any of these terms, don't hesitate to look them up to make sure of their meaning

QUIT   Save the family information to the "Family.dat" file, and terminate the program.

Example
The "Family.trn" output below reflects the input statements and commands by echo printing the input. The information output as a result of PRINT is indented below t h e command.

MALE Adem EXISTS
FEMALE Havva EXISTS
Adem MARRIES Havva
Adem AND Havva BEGET SON Ferit
Havva AND Adem BEGET DAUGHTER Gül
FEMALE Leyla EXISTS
Adem AND Havva BEGET SON Tahsin
MALE Cemal EXISTS
Leyla MARRIES Cemal
Cemal AND Leyla BEGET SON Cem
Leyla AND Cemal BEGET SON Bülent
Cem MARRIES Gül
FEMALE Selma EXISTS
Selma MARRIES Bülent
FEMALE Jale EXISTS
FEMALE Buket EXISTS
Jale MARRIES Ferit
Buket MARRIES Tahsin
Cem AND Gül BEGET SON Kemal
Tahsin AND Buket BEGET SON Mahmut
Buket AND Tahsin BEGET DAUGHTER Merve
Gül AND Cem BEGET DAUGHTER Ayşe
Cem AND Gül BEGET SON Sezai
Buket AND Tahsin BEGET DAUGHTER Esin
PRINT Sezai's SIBLINGS

  Kemal
  Ayşe
 PRINT Sezai's SISTERS
  Ayşe

PRINT Ayşe's BROTHERS
  Kemal
  Sezai

PRINT Ayşe's SISTERS

PRINT Cem's CHILDREN
   Kemal
   Ayşe
   Sezai

PRINT Gül's CHILDREN
   Kemal
   Ayşe
   Sezai

PRINT Havva's SONS
   Ferit
   Tahsin

PRINT Bülent's PARENTS
   Leyla
   Cemal

PRINT Adem's PARENTS
   unknown

PRINT Adem's GRANDPARENTS
   Unknown

PRINT Mahmut's GRANDPARENTS
   Adem
   Havva
   unknown

PRINT Ayşe's GRANDPARENTS
   Leyla
   Cemal
   Adem
   Havva

PRINT Sezai's UNCLES
   Ferit
   Tahsin
   Bülent

PRINT Sezai's AUNTS
PRINT Esin's AUNTS
 Gül
QUIT

Data Structure:
You are going to represent Parentage and Sibling relations by "left child right sibling" binary trees.
How to represent "Marriage" relations is up to your design decision.

2   What to deliver?

- **SDD:** You are going to deliver a software design document until May 28th Friday, 17:00 to ETA 104. The document should follow the guidelines explained in the PS. You are

encouraged to use flowcharts, diagrams, and graphical aids to make our document easier to read and understand.

- **CODE:** The complete working code will be delivered on June 7th Monday until 17:00. You are expected to write a clear code, with lots of comments, good variable and class names, and as object-oriented as possible. If you make changes to the SDD you should resubmit it.

  We are going to check your code for
  - -Good programming style
  - -Compliance with project specifications
  - -Compliance with design document

NOTE:
- Our department has very strict codes for student "collaboration" on projects.
- Remember that the **only** aim of this project is to teach you to have good programming skills that you are going to use for the rest of your lives. There is no way of learning programming other than hands-on experience.
- Both the document and the project will require your full attention for at least a couple of days. If you start them one day before the deadline, it will not possible to complete them in a satisfactory manner.
- Please work on your own, and ask your assistants immediately if there is a problem you cannot handle.