Linear Data Structures
Stable Marriage Problem
Project 3 100 points Due Thursday October 12

For this assignment, you may work in pairs. There is no extra credit for working alone.

The assignment is to write a console-based program to solve the Stable Matching Problem using the Gale-Shapley algorithm.   You must use a linked list for the preference list of each man and woman. See the posting "Stable Matching.ppt" in the Algorithms folder. There are also numerous references to the Gale-Shapley algorithm on the Internet.
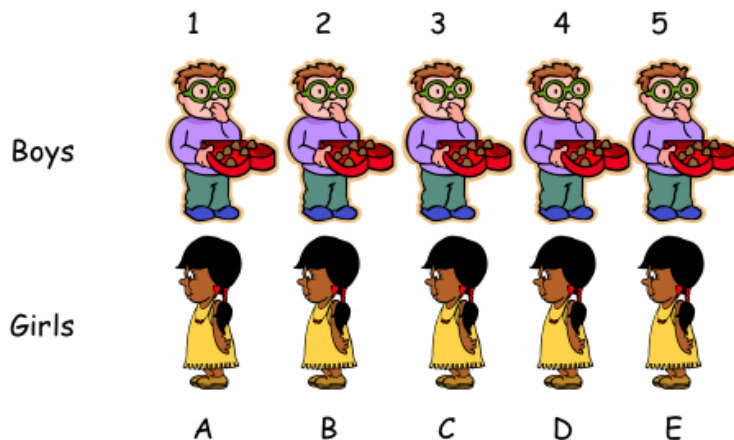
The input to the program will be a text file listing, in order,
1. the number n of men and women,
2. the names of the n men,
3. the names of the n women,
4. the list of preferences for each of the n men, and
5. the list of preferences for each of the n women.

For example, consider the following example of the contents of a file

```
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5
Brian George John Robert Stephen
Anne Joyce Nancy Patricia Susan
// Preferences Men:
```

```
    John: Susan Joyce Nancy Patricia Anne
    Robert: Nancy Anne Joyce Susan Patricia
    Brian: Patricia Susan Joyce Anne Nancy
    Stephen: Joyce Anne Susan Nancy Patricia
    George: Nancy Joyce Patricia Susan Anne

 // Preferences Women:
    Nancy: John Brian Stephen Robert George
    Joyce: George John Stephen Robert Brian
    Patricia: George Brian Robert Stephen John
    Anne: George Stephen John Brian Robert
    Susan: Brian George Stephen John Robert
----------------------------------------------------
```

The output will be the list of arranged marriages.
```
----------------------------------------------------
Marriages:
    (Anne,Stephen)
    (Joyce,George)
    (Susan,John)
    (Patricia,Brian)
    (Nancy,Robert)
----------------------------------------------------
```

The program will operate as follows:
1. Ask the user for the name of the input file
2. Display the number of men and women, and the lists of men and women
3. Display the list of men's preferences and the list of women's preferences
4. Ask the user to select one of the following:
        Men Propose
        Women Propose
5. Ask the user for the go-ahead to apply the Gale-Shapley algorithm
6. Display the list of marriages.

The submission should include a printout of using the data given above.

Extra Credit: (30 points) Construct a GUI using JavaFX. The GUI must be defined in a separate class and follow the posted coding guidelines. You must declare all variables at the top of the class or method, and must not initialize variables in the declaration. (10 points for correctness of the GUI, 10 for the efficacy and attractiveness of the GUI, and 10 for following the coding guidelines nicely.)