**GALE-SHAPLEY ALGORITHM**

**1. Implementation of a stable marriage problem.**

The Stable Marriage Problem states that given N men and N women, where each person has ranked all members of the opposite sex in order of preference, marry the men and women together such that there are no two people of opposite sex who would both rather have each other than their current partners. If there are no such people, all the marriages are "stable".

Consider the following example.

Let there be two men m1 and m2 and two women w1 and w2.

Let m1's list of preferences be {w1, w2}

Let m2's list of preferences be {w1, w2}

Let w1's list of preferences be {m1, m2}

Let w2's list of preferences be {m1, m2}

The matching { {m1, w2}, {w1, m2} } is not stable because m1 and w1 would prefer each other over their assigned partners. The matching {m1, w1} and {m2, w2} is stable because there are no two people of opposite sex that would prefer each other over their assigned partners.

*(continued…)*

**Output:**

```
ubuntu@suyash-18-04:~/Desktop/Sem 5/IT300/Assignment2$ g++ stablemarriage.cpp
ubuntu@suyash-18-04:~/Desktop/Sem 5/IT300/Assignment2$ ./a.out
Number of men/women:
5
Enter names of men (5 space seperated strings):
V W X Y Z
Enter names of women (5 space seperated strings):
A B C D E

Enter preference list of MEN..
NOTE:(5 Space seperated strings of women from highest to lowest preference)
Preference list of V:
A B C D E
Preference list of W:
B C D A E
Preference list of X:
C D A B E
Preference list of Y:
D A B C E
Preference list of Z:
A B C D E

Enter preference list of WOMEN..
NOTE:(5 Space seperated strings of men from highest to lowest preference)
Preference list of A:
W X Y Z V
Preference list of B:
X Y Z V W
Preference list of C:
Y Z V W X
Preference list of D:
Z V W X Y
Preference list of E:
V W X Y Z

FINAL MATCHING IS: (Format: (woman,man)):
(A,W)
(B,X)
(C,Y)
(D,Z)
(E,V)
ubuntu@suyash-18-04:~/Desktop/Sem 5/IT300/Assignment2$
```