COMP 6651: Algorithm Design Techniques
Fall 2016: Programming Assignment 3

1 Problem

You are trying to organize an event for k attendees from among a potential set of n attendees. The problem is that there are some potential attendees that are absolutely inseparable; they refuse to go without each other. After extensive discussions with all potential attendees, you have drawn up a list of pairs $(x[], y[])$, such that $x[i] \neq y[i]$ for all i, and $x[i]$ will go to the event if and only if $y[i]$ will go to the event. You need to figure out, given the constraints above, if it is possible to organize the event for exactly k attendees.

linked list…? [x]->Y[0]->Y[1] the

2 Input

DFS;;; depth of tree = k ?

The input file has at most 3000 strings. Each string contains n, the total number of potential attendees, k, the number of desired event attendees, and and 2 input arrays $x[]$ and $y[]$.

Subset sum for extra array of connected component

$2 \leq n \leq 1000$
$1 \leq k \leq 1,000$
$1 \leq |x| = |y| \leq 2500$
$0 \leq x[i], y[i] \leq n - 1$ for all i
$x[i] \neq y[i]$ for all i

3 Output

For each string in the input file you need to print Possible if it is possible to organize the event for exactly k attendees, otherwise print Impossible. The output should be written in a separate file called output.

4 Example

Sample input:

$4, 2, \{0, 1\}, \{2, 3\}$
$6, 3, \{0, 1, 2, 3, 4, 5\}, \{1, 2, 3, 4, 5, 0\}$
$6, 6, \{0, 1, 2, 3, 4, 5\}, \{1, 2, 3, 4, 5, 0\}$

Sample Output

```
Possible
Impossible
Possible
```

Explanation:
In the first input there are 4 potential attendees, and you want to create an event for 2 people. The attendee 0 will go if and only if 2 will go, and the attendee 1 will go if and only if 3 will go. So one possible solution is to send 0 and 2 to the event.

5 Requirements

For the constraints given above, your program should run in 3 seconds. You must submit source code for a program written in C#/C++/Java on the Electronic Assignment System. Some test cases will be provided on the course website. You can verify if your program works on the test cases before submitting.

6 Programmer-on-duty

There will be a programmer-on-duty, Tejas Puranik, available to help you with the assignment on Wednesdays 6pm to 9pm in H481