

## Home Work 2 – Graphic Sequence

Due date: September 3, 2009

### Problem:

A degree sequence of a graph  $G$  is a sequence of the degrees of the vertices of  $G$  in non-increasing order. A sequence  $S$  of non-negative integers is graphic if and only if there is a simple graph  $G$  such that degree sequence of  $G$  is  $S$ . Write a program to check if a given sequence  $S$  is graphic. If  $S$  is graphic, also output one such graph  $G$  that  $G$ 's degree sequence is  $S$ . You can use Havel-Hakimi theorem to solve this problem.

### Tasks:

1. Design an algorithm to solve the above problem.
2. Write a program implementing your algorithm. Input to your program is a text file containing a sequence in the following format.

$d_1, d_2, d_3, \dots, d_n$

An example input file:

3, 3, 2, 2

3. Submit 1-3 pages report that include pseudocode and description of your algorithm, running time and memory requirement of your algorithm, limitations of your algorithm (if any), anything else that you like to say about your algorithm.
4. Also submit the source code and the test cases you used to test your code.
5. Name your files as follow: if your last name is “xyz”, name the files as “zxy-hw2.pdf”, “zxy-hw2.c”, “zxy-hw2.cpp”, “zxy-hw2.dat”, etc.