ECEN 475 Fall 2020 Lab1

Due 11:59pm, September 15, Tuesday
Submission must be through ecampus

Part 1. Please write a C/C++/MATLAB program to implement Kernighan-Lin's partitioning algorithm. The objective is to minimize the number of edges in the cut and the partitioning should be two-way-even. The number of nodes in the test case would be even.

Input: A *text file* describing a set of even number of nodes and a set of edges. If there are *n* nodes, the node indices are continuous integers from *1* to *n*.

Input file format:

• The first line has two numbers – the number of nodes followed by the number of edges.
• Each of the following lines has two numbers that are indices of two nodes of an edge.

For example:

3 2
1 2
2 3

The input indicates there are three nodes and two edges. Node1 and node 2 are the indices of an edge; node 2 and node 3 are the indices of an edge.

Requirements:

• The initial solution must be partition *{1, 2, …,n/2}* and *{n/2+1, n/2+2, …, n}*.
• The input filename should be taken as the ***argument at command line*** in Linux/UNIX.
• Please submit source code and the executable code for Linux/UNIX.
• The output should be displayed to screen in a self-clear format.

Output:

• Two partitions, each of which is described by the indices of its member nodes.
• Cut set, represented by the edges in the cut, an edge is denoted by a pair of node indices.

Grading: *Your executable code will be evaluated by certain test cases. The grading will consider your program speed besides the solution correctness and completeness.*