Department of Electronics Engineering

National Yang Ming Chiao Tung University

Programming Assignment #2

Two-Way Partition

Deadline: 2025/05/04

Lab 2 Introduction

This lab is an exercise lab to implement partition algorithm, and you have to compare your result with hMetis. Using K-L, F-M, or any partitioning algorithm you know.

Input

Given a Net List input file

Example (input.txt)

```
3 5
1 2 3
2 4
1 5
```

Explanation of the Input

1. The first line represents how many nets, how many nodes there are
   (Ex. 3 means 3 nets, 5 means 5 nodes)
2. The next line to the last line defines the nodes to which the net is connected.
   (Ex. 1 2 3 means the first net connect to node 1, 2 and 3.)

Output

Output Format (output.txt)

```
1
0
1
0
1
```

Explanation of the Output

1. The first line to the last line defines the groups to which the node belongs.
   (Ex. The first line 1 means the first node (node 1) belongs to the group 1. The

second line 0 means the second node (node 2) belongs to the group 0.

Algorithm

You will need to partition the given nodes to two groups and try to minimize the number of cut between the two groups while balancing number of nodes. The balance factor is 0.45 ~ 0.55.

Evaluation

1. You **MUST WRITE YOUR OWN CODE**. Copying codes may result you to FAIL this course.
2. Naming rule.
   A. Name of the binary after "make" – Lab2
   B. Execution procedure: ./Lab2 [input]
   C. Name of the output file – **output.txt**
   D. Not following specified naming rule will receive zero mark
3. Hidden cases will be evaluated
4. A verifier is released to evaluate your result.
   ./verifier [input] [output]
   (Please make sure that your output results can pass the verifier)

Program Submission

Please upload the following materials in a .zip file (Student_ID.zip) to New E3 by the deadline, specifying your student ID in the subject field. (If your submission file is not .zip file, you will get zero point!!)

1. Source code (.cpp, .h).
2. Makefile
3. Executable binary.
4. A Readme file (Information to how to compile and execute your code.)

Grading Policy

We will determine your score according to the minimum cut result and the run time for 4 test case. (Priority: minimum cut result > run time)

1. For each case, the run time limit is up to 30 seconds. It will be regarded as "failed" if you use more than 30 seconds.
2. If you can generate a legal solution, you can get at least 70 at that case.
3. Random output is forbidden. If your answer 50 times worse than hMetis', you would get 0 point at that case.

Notices

- Due Date : 2025/05/04 23:55:00
- Please make sure your code is available on our linux server. If it cannot be executed, you will get zero point.
- Accept four days late submission, 10% deduction per day.
  Submission will not be accepted after 5/8.
- Plagiarism is strictly forbidden. 0 grade guarantee.