

Lab2 –Partition

Deadline: 2021/11/12

Lab 2 Introduction

This lab is an exercise lab to implement partition algorithm, and you have to compare your result with hMetis.

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 in input) belongs to the group 1. The second line 0 means the second node (node 2 in input) 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 $0.45 \sim 0.55$.

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)

Grading Policy

We will use “hMetis” to compare the results with your partitioner.

1. If your solution is as good as hMetis’s solution, you can get 100.
 2. If you can generate a legal solution, you can get at least 70.
 3. If you can generate a solution but it is not legal (violate the balance factor), you will get at most 70.
 4. If your program can’t generate a solution, you will get 0 point.
- After that, we will determine your score according to the minimum cut result and the run time. (Priority: minimum cut result > run time)
5. **Please make sure your code is available on our linux server.** If it cannot be executed, you will get zero point.
 6. 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.
 7. Accept four days late submission, 10% deduction per day.
That is, if you hand in on 11/13, the score will be *0.9; if you hand in on 11/16, the score will be *0.6, and submission will not be accepted after 11/16.

Submission

Please upload the following materials in a .zip file (e.g. StudentID.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 make and execute your code.)**