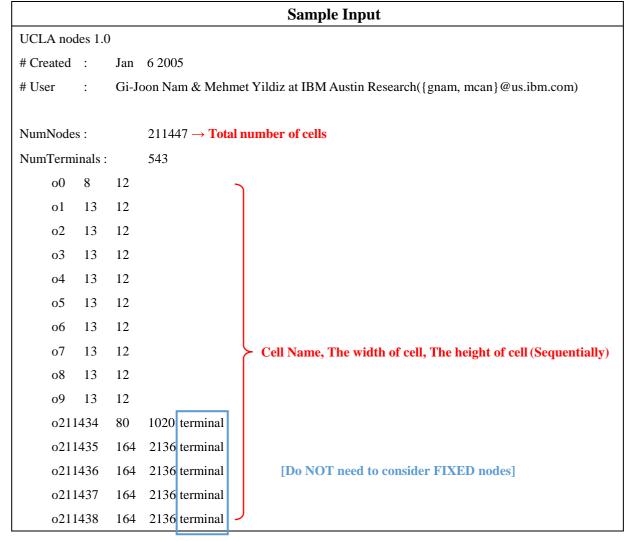
VLSI/CAD Group

Programming Assignment #2: FM program – [2-way Partition]

Let $C = \{c_1, c_2, c_3, ..., c_n\}$ be a set of n cells and $N = \{n_1, n_2, n_3, ..., n_m\}$ be a set of m nets. Each net n_i connects a subset of the cells in C. The 2-way partition problem is to partition n cells in set C into two disjoint groups, G_1 and G_2 such that the overall cut size is minimized. Note that no cell replication is allowed. The "cut size" s is given by "the number of nets having cells on both G_1 and G_2 ". We define the group size as the area of cells in the group. The partition constraint is that " $|G_1|/(|G_1|+|G_2|) \approx \gamma$ where $|G_i|$ denote the size of G_i and γ is equal to 0.4".

Input

.nodes file



FIXED nodes

.nets file

```
Sample Input
UCLA nets 1.0
# Created: Jan 6 2005
         : Gi-Joon Nam & Mehmet Yildiz at IBM Austin Research({gnam, mcan}@us.ibm.com)
# User
NumNets : 221142 → Total number of nets
NumPins: 944053 \rightarrow \textbf{Total number of pins}
NetDegree: 4
                n0 \rightarrow Net \ n0 \ linking 4 \ cells
     o197239 I:-0.500000
                                 -6.000000
     o197110
                O:-1.500000
                                 -3.000000
                                                 Cells linked by n0
                                 -2.000000
     o85644
                I:-6.000000
                                                 Cell Name, Input/Output Pin, OffsetX, OffsetY (Sequentially)
         I:-3.000000
                            -5.000000
                                                                  [Only need Cell Name]
```

Output

The program output asks you to find out the cut size (as small as possible), the sizes of G_1 and G_2 , and the cells in G_1 and G_2 . The following table gives the output format. Please follow the output format to generate output file.

```
      Sample Output

      Cut_size: 4

      G1_size: 3

      G2_size: 3

      Time: 0.000 s

      G1:

      o0 o1 o2;

      G2:

      o4 o5 o6;

      Cut_set:

      n1 n2 n3 n5;
```

Language/Platform

The program should be performed on the Linux machine.

Command Line Format

FM_StudentID <circuit.nodes> <circuit.nets> [circuit.out]

Example: ./FM_XXXXXXXX adaptec1.nodes adaptec1.nets adaptec1.out

Note that you should write your own make file.

Evaluation Score

The released **five** benchmarks and **one hidden** benchmark will be used to evaluate score.