



Homework #1

◆ **Due 11 : 55 pm, Nov 30, 2019**

◆ **Language**

◆ Please use C++ language to implement your program.

◆ **Program**

◆ Use **Kernighan-Lin Heuristic** to minimize the cut size.

◆ Vertex pairs which give **the largest decrease** or **the smallest increase** in cut size are exchanged.

◆ These vertices are then **locked** (and thus are prohibited from participating in any further exchanges).

◆ This process continues until all the vertices are locked.

◆ Find the set with the **largest partial sum** for swapping.

◆ Unlock all vertices.

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◆ Input files description

◆ ***.nodes

NumNodes : 488 ---> number of nodes

```

o0
o1
o2
o3
o4
o5
o6
o7
o8
o9
⋮
    
```

name of node

◆ ***.nets

NumNets : 3155 ---> number of nets

```

n0 ---> name of net
    o0
    o177 } nodes linked by net
n1
    o0
    o206
n2
    o1
    o324
⋮
    
```



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◆ Output format

◆ ***.out

```
runtime : 1.23 s ---> runtime
first_cutsizes : 10 ---> initial cutsizes
final_cutsizes : 4 ---> final cutsizes
G1 :
o0 o1 o3 ;

G2 :
o2 o4 o5 ;

cutset :
n0 n2 n4 n5 ;
```



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◆ Note

- ◆ Please put the **first half nodes into one group** and **the remaining nodes in the other group in the beginning according to their sequence in an input file.**
- ◆ **Please select the first maximum gain value** to swap pairs of nodes when you have several maximum gain values in an iteration.
- ◆ There are 4 public and 1 hidden benchmarks to evaluate your program.
- ◆ We give a score to a benchmark when the result is correct. The runtime is also considered when we evaluate your score.
- ◆ Please use the following format to run your program:
 - ◆ `KL_EXXX.exe name_of_benchmark`
 └──┬──┘
 Your student ID





Homework #1


◆ Upload data

- ◆ Please upload a **zip** file.
- ◆ The zip file contains a folder which is named by your student ID.
- ◆ The folder must contain your executable file, source code and header file(if exists).

◆ e.g. KL_EXXX.exe, KL_EXXX.cpp and KL_EXXX.h


Your student ID


Your student ID


Your student ID