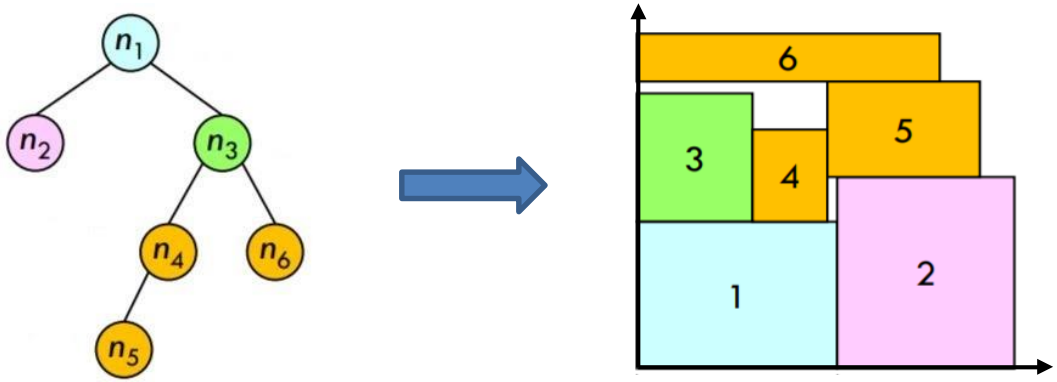
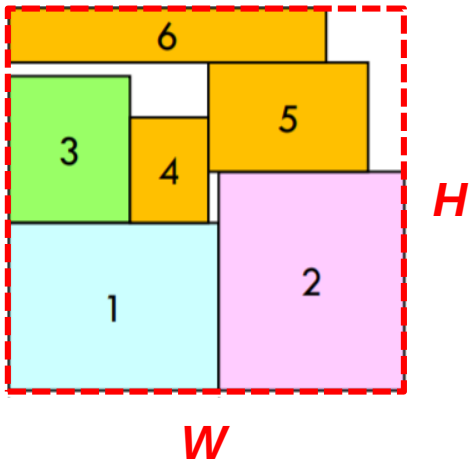
# Homework #2

- **Due 00:00 am, May 26, 2021**
- Language
  - Please use C++ language to implement your program.
- Program
  - Given the structure of a B*-tree, show its packing result.
  - Use B*-tree packing algorithm to determine coordinates of modules.
  - After packing, calculate total area and wirelength of modules.

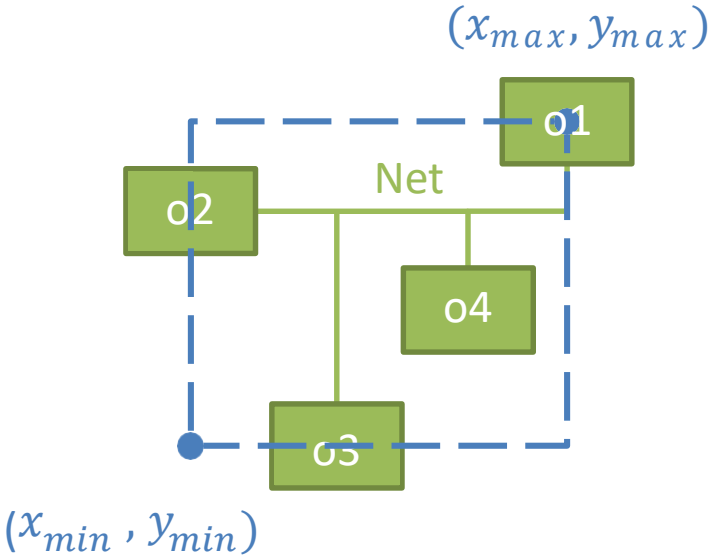


# Homework #2

- Calculate Area
  - The area of the minimum rectangle containing all modules.
- Calculate Wirelength
  - Use Half-Perimeter Wire Length(HPWL).
  - All net pins of the modules are located on center.
  - Calculate the sum of all nets HPWL.




$$Area = W \times H$$




$$HPWL = (x_{max} - x_{min}) + (y_{max} - y_{min})$$

# Homework #2

- Two input files
  - .nodes
    - Name : module name.
    - Dimension : width, height.
    - Relation : parent, left, right, where X is “NULL”.
  - .nets
    - Net name
      module1 module2 ……

example.nodes - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

```
NumNode : 3

name : o1
dimension : 2 3
relation: X o2 o3

name : o2
dimension : 1 3
relation: o1 X X

name : o3
dimension : 3 1
relation: o1 X X
```

example.nets - 記事本

檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)

```
NumNet : 3

NET1
    o1 o2
NET2
    o2 o3
NET3
    o1 o2 o3
```

# Homework #2

- Two output files
  - ** is benchmark name
  - **.m : The coordinates of all modules in Matlab format. Please see " Output_format.pdf " for detailed information.
  - report_**.txt : Contain benchmark name, area, wirelength.

report_ami33.txt

Benchmark : ami33

Wirelength : 12345678

Area : 500

- Execution program
  - ./PK_EXXX.exe benchmark_name
    - You must input the benchmark name.
    - In your code, you must revise the name to read *.nodes and *.nets files.
    - ex.

input ami33 → read "ami33.nodes" and "ami33.nets"

# Homework #2

- Note
  - There are 3 test data and 1 hidden test data.
  - There exists no overlap between modules.
  - The area and wirelength take integers.

- Upload data
  - Please upload a zip file.
  - The zip file contains a folder which is named by your student ID.
  - Put your executable file, source code and header(if exists) in the folder.
    - e.g. PK_EXXX.exe , PK_EXXX.cpp and PK_EXXX.h.

Your student ID  Your student ID  Your student ID