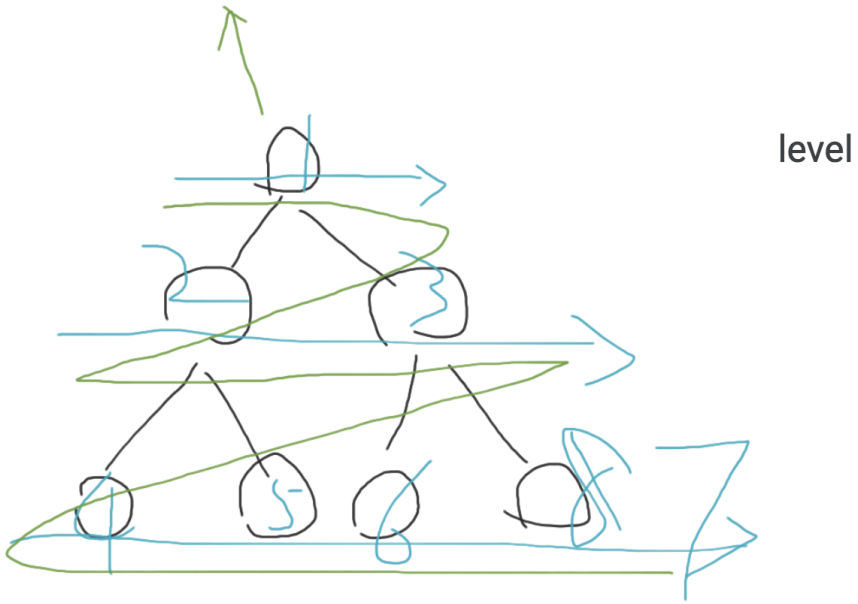
Phill-DS-0124

BFS (Breath-First Search)

- traverse 方式
- 本質上是Queue的問題
  - TreeNode → Node
  - QueueNode → 根據綠線來連結
  - Queue 框架




```
#include <iostream>
using namespace std;

struct TreeNode{
  int data;
  TreeNode *llink;
```

```
  TreeNode *rlink;

  Tree(int val): data(val), llink(nullptr), rlink(nullptr) {}
};

struct QueueNode{ //不自帶資料
  TreeNode* treeNode;
  QueueNode* next;

  QueueNode(TreeNode* node): treeNode(node), next(nullptr) {}
};

class Queue{
  private:
    QueueNode* front;
    QueueNode* rear;

  public:
    Queue(): front(nullptr), rear(nullptr) {}

    ~Queue(){
      while(front!= nullptr){
        QueueNode* temp= front; //ready to release
        front = front ->next; // 指向下一個
        delete temp;
      }
    }

    void enqueue(TreeNode* node){
      QueueNode* newNode = new QueueNode(node);
      if(rear == nullptr){
        front = rear = newNode;
        return;
      }
      rear->next = newNode;
      rear = newNode;
```

```
    }

    TreeNode* dequeue(){
      if(front==nullptr)
        return nullptr;
      QueueNode* temp = front;
      front = front -> next;
      if(front==nullptr)
        rear=nullptr;
      TreeNode* result= temp->treeNode;
      delete temp;
      return result;
    }
};




int main()
{

    return 0;
}
```