

广度优先搜索

【最短路径算法综述】

- Shortest Path Problem in Unweighted Graphs
Bread First Search
- Single-Source Shortest Path Problem
Dijkstra algorithm
Bellman-Ford algorithm
- All-pairs Shortest Path Problem
Floyd-Warshall algorithm
- Application
A system of difference constraints

【算法概述】

- 广度优先搜索(Breadth-first Traversal)

BFT算法实现需要一个先进先出的队列. 假设有一个从一个头结点开始的遍历搜索. 头结点访问过后, 和它相邻的所有结点都会放到一个队列中. 然后从队列中取出一个结点, 执行跟头结点一样的操作, 访问过它之后将它所有的相邻结点都放在队列中待搜索. 重复上述操作, 直到满足条件或者所有点都被访问过终止.

- 伪代码

```
1  procedure BFS( $G, v$ ) is
2      create a queue  $Q$ 
3      create a set  $V$ 
4      add  $v$  to  $V$ 
5      enqueue  $v$  onto  $Q$ 
6      while  $Q$  is not empty loop
7           $t \leftarrow Q.dequeue()$ 
8          if  $t$  is what we are looking for then
9              return  $t$ 
10         end if
11         for all edges  $e$  in  $G.adjacentEdges(t)$  loop
12              $u \leftarrow G.adjacentVertex(t, e)$ 
13             if  $u$  is not in  $V$  then
14                 add  $u$  to  $V$ 
15                 enqueue  $u$  onto  $Q$ 
16             end if
17         end loop
18     end loop
19     return none
20 end BFS
```

$d[u]=d[t]+1;$
 $parent[u]=t;$