第七章 Tree

7.1

* **Tree** : acyaclic + connected + undirected
  + Tree 的特性
    - Bipartite (不含奇數長度cycle)
    - 每邊皆bridge
    - 最少邊connected graph
    - ⇔ acyaclic 且 | E | = | V | - 1
    - ⇔ connected 且 | E | = | V | - 1
* **Trival Tree** (degenerated tree) : one point tree ( | V | = 1 )
* **Nontrival Tree** : | V | ≥ 2
  + ⇔ 任二點恰一條path相連 ( acyaclic,connected,| E | = | V | -1 )
  + ⇔ connected 去一邊變 disconnectd
  + ⇔ acyaclic 加一邊恰含 1 cycle
  + ⇒ 至少2 個 pendant
* **Pandent** : dev(v) = 1 , v 為 pandent
* **Forest** : acyaclic + undirected ( | E | = | V | - K(G) )

7.2

* **directed tree** : 視為無向為tree
* **root tree** : ∃! r∈ V 使得 **id(r)=0**
* **m-ary tree** : internal **至多** m 個 son
* **binary tree** : m=2
* **full m-ary tree** : **恰含** m 個 son
* **complete m-ary tree** : full m-ary tree + 所有的**leaf相同level**
* **balanced tree** : 所有的leaf 具 **level h or h-1**

7.3

* **Spanning Tree** : G(V,E) : connected

若T為G之spanning subgraph，且T為tree

稱T為G之一Spanning Tree (S.T)

* G 含 S.T ⇔ G : connected
* G : connected planner ⇒ v-e+r=2
* 求G之S.T個數 : 暴力法
* **Matrix Tree**
  + V={ } , M =[ ] : nn
  + N(G) = M 之各cofactor